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1. REVIEWS AND BOOKS

4410 Ahuja, S. (Editor): *Chromatography and Separation Chemistry: Advances and Developments*. Developed from a Symposium at the 188th Meeting of the American Chemical Society, Philadelphia, August 26-31, 1984), *ACS Symposium Series*, Vol. 297, Washington, 1986, 304 p.; *C.A.*, 104 (1986) 179490a.

4411 Aigner, H. (Editor): (*Koenigstein Chromatography Sessions. 8th Report and Discussion Session on High-Performance-Liquid Chromatography, September 30 to October 2, 1985, Bad Soden/Taunus*). Waters, Division of Milipore, Eschborn, 1985, 371 p.; *C.A.*, 104 (1986) 193918c.

4412 Browne, P.J.: Modular systems for ion chromatography. *Lab. Pract.*, 35 (1986) 43-45; *C.A.*, 105 (1986) 34592w - a review with 6 refs.

4413 De Graeve, J., Berthou, F., Frost, M., Arpino, P. and Prome, J.C.: (*Chromatographic Methods Combined with Mass Spectrometry. Technology and Applications in the Fields of Environmental Studies, Pharmacology and Biochemistry*). Lavoisier, Paris, 1986, 382 p.; *C.A.*, 105 (1986) 17438h.

4414 Gao, F.: (Application of chromatographic analysis in the research of space aeronautics). *Sepu*, 4 (1986) 37-45; *C.A.*, 104 (1986) 236263e - a review with 48 refs.

4415 Haken, J.K.: Chromatographic analysis of some condensation polymers after alkali fusion. *Ind. Eng. Chem. Prod. Res. Dev.*, 25 (1986) 163-171; *C.A.*, 104 (1986) 225475z - a review with 44 refs.

4416 Hanaoka, Y.: (Ion chromatography). *Bunseki*, (1986) 162-168; *C.A.*, 105 (1986) 17202b - a review with 70 refs.

4417 Haug, J.D.: Chromatography: Selected techniques and applications. *Am. Biotechnol. Lab.*, 4 (1986) 30-35; *C.A.*, 105 (1986) 19918p - a review with 10 refs.

4418 Ishii, D.: (Separation technology for support of ultramodern chemistry. Chromatography). *Kagaku to Kogyo (Tokyo)*, 37 (1984) 282-285; *C.A.*, 104 (1986) 236247c - a review with no refs.

4419 Johnson, E.L.: Evolving applications of ion chromatography. *Chim. Oggi*, (1986) 43-46; *C.A.*, 104 (1986) 236259h - a review with no refs.

4420 Jupille, T.: Column and eluent selection for single-column ion chromatography. *Am. Lab. (Fairfield)*, 18 (1986) 114-126; *C.A.*, 105 (1986) 34611b - a review with 27 refs.

4421 Kasai, K.: (Sensible use of chromatography - application to the studies of interaction). *Kagaku to Kogyo (Tokyo)*, 37 (1984) 294-295; *C.A.*, 104 (1986) 182582n.

4422 Kataoka, K. and Sakurai, Y.: (Expectations of chromatography in future - in biological and medical aspect). *Kagaku to Kogyo*, 37 (1984) 308-309; *C.A.*, 104 (1986) 182584q - a review with 5 refs.

4423 Li, Y. and Lu, P.: (Ion chromatography (IC) and its applications). *Sepu*, 4 (1986) 49-67; *C.A.*, 105 (1986) 34603a - a review with 30 refs.

4424 McNair, H.M., Galhiane, M.S. and Lancas, F.M.: (High-performance liquid chromatography). *Rev. Quim. Ind. (Rio de Janeiro)*, 54 (1985) 21-26; *C.A.*, 104 (1986) 236546z - a review with 9 refs.

4425 Mou, S. and Hou, X.: (Recent development in ion chromatography). *Fenxi Huaxue*, 13 (1985) 946-951; *C.A.*, 105 (1986) 17209j - a review with 34 refs.

4426 Ogden, G.: Analysis in the ion exchange tradition. *Nature*, 320 (1986) 771; *C.A.*, 105 (1986) 21097p - a review with 9 refs.

4427 Poppe, H.: HPLC-separation under high pressure. *Nat. Tech.*, 54 (1986) 118-133; *C.A.*, 105 (1986) 21092h - a review with 4 refs.

4428 Revillon, A.: (Liquid chromatography documentation bases). *Spectra 2000*, 108 (1985) 25-31; *C.A.*, 104 (1986) 236241w - a review with many refs.
4429 Sandra, P. and Bertsch, W. (Editors): *Proceedigns of the 6th International Symposium on Capillary Chromatography. (Riva del Garda, Italy, May 14-16, 1985).* Huethig, Heidelberg, 1985, 963 p.; *C.A.*, 104 (1986) 179318a.
4430 Sjoedahl, J., Dilley, K.J., Eriksson, R., Pellerin, J., Parvez, S.H. and Arlinger, L.: Technical aspects of biochemical high-performance column liquid chromatography. *Prog. HPLC*, 1 (Gel Permeation Ion-Exch. Chromatogr. Proteins Pept.) (1985) 179-217; *C.A.*, 104 (1986) 182575n - a review with 26 refs.

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2. FUNDAMENTALS, THEORY AND GENERAL

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4431 Hanson, R.W. and Smith, N.G.: Flash chromatography. *Educ. Chem.*, 23 (1986) 45-46; *C.A.*, 105 (1986) 5779g.
4432 Johnson, B.P., Gabrielsen, B., Matulenko, M., Dorsey, J.G. and Reichardt, C.: Solvatochromic solvent polarity measurements in analytical chemistry: synthesis and applications of ET-30. *Anal. Lett.*, 19 (1986) 939-962.
4433 Levin, S. and Grushka, E.: System peaks in liquid chromatography: their origin, formation and importance. *Anal. Chem.*, 58 (1986) 1602-1607.
4434 Phillips, J.B.: Comments on improvement of the limit of detection in chromatography by an integration method. *Anal. Chem.*, 58 (1986) 2091.
4435 Synovec, R.E. and Yeung, E.S.: Comparison of an integration procedure to Fourier transform and data averaging procedure in chromatographic data analysis. *Anal. Chem.*, 58 (1986) 2093-2095.
4436 Wolff, M., Kersten, D. and Göber, B.: Möglichkeiten der systematischen Optimierung von HPLC Trennungen. *Pharmazie*, 41 (1986) 502-506.

For additional information see:
C.A., 105 (1986) 26741d.

See also 4428, 4480, 5087.

2b. Thermodynamics and theoretical relationships

4437 Castro, V. and Canselier, J.-P.: Application of the hydrophobic effect in reversed-phase high-performance liquid chromatography to the prediction of the critical micelle concentration. *J. Chromatogr.*, 363 (1986) 139-146.
4438 Cheng, W.: Surface exclusion and geometrical exclusion. *J. Chromatogr.*, 362 (1986) 309-324.
4439 Chu, A.H.T. and Langer, S.H.: Measurement of reaction rate constants in the liquid chromatographic reactor: mass transfer effects. *Anal. Chem.*, 58 (1986) 1617-1625.
4440 Fedotov, S.N. and Yablochkin, A.V.: (Optimization of conditions for separating a mixture in extraction chromatography). *Zh. Anal. Khim.*, 41 (1986) 611-616; *C.A.*, 105 (1986) 34686e.
4441 Morris, C.E.: Dual-column chromatography for peak identification in ion moderated partition HPLC. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 415-416.
4442 Otto, M. and Bandemer, H.: Pattern recognition based on fuzzy observations for spectroscopic quality control and chromatographic fingerprinting. *Anal. Chim. Acta*, 184 (1986) 21-31.
4443 Wilhelm, A.M., Riba, J.P., Muratet, G., Peyrouset, A. and Prechner, R.: Hydrodynamic studies in large-diameter columns. *J. Chromatogr.*, 363 (1986) 113-123.

See also 4483, 4509.

2c. Relationship between structure and chromatographic behavior

4444 Wells, M.J.M., Clark, C.R. and Patterson, R.M.: Structure-retention relationship analysis for some mono- and polycyclic aromatic hydrocarbons in reversed-phase liquid chromatography using molecular connectivity. *Anal. Chem.*, 58 (1986) 1625-1633.

2d. Measurement of physico-chemical and related values

4445 Dustov, S.I., Zelenkova, N.F. and Volkov, S.A.: Effect of the adsorption of elements on the temperature dependence of the retention and extraction indexes in liquid chromatography. *Zh. Fiz. Khim.*, 60 (1986) 719-722; *C.A.*, 105 (1986) 17560s.

For additional information see:
C.A., 105 (1986) 12641j.

See also 3349, 4724, 4994.

3. GENERAL TECHNIQUES

3a. Apparatus and accessories

4446 Bell, J.P., Simpson, R.A. and Cunico, R.L.: Microrobotics LC autosampler. *Am. Lab. (Fairfield)*, 18 (1986) 94-103; *C.A.*, 105 (1986) 34849k.

4447 Bevan, C.D., Strutton, A.M. and Smith, M.S.: Construction and use of an inexpensive large scale preparative liquid chromatography column based on the Jobin Yvon Chromatospac Prep 100. *Lab. Pract.*, 35 (1986) 113-115; *C.A.*, 105 (1986) 8374g.

4448 Claessens, H.A. and Spruit, J.M.: A microbore HPLC system. *Int. Lab.*, 16, No. 5 (1986) 78-87.

4449 Fan, L., Liu, X. and Eang, Q.: (Testing and applications of the Model SY-221 ion chromatograph). *Sepu*, 4 (1986) 103-105; *C.A.*, 105 (1986) 34663v.

4450 Glatz, B. and Huber, L.: (Test of solvent delivery systems in HPLC). *LaborPraxis*, 10 (1986) 478-485; *C.A.*, 105 (1986) 34688g.

4451 Kaminski, M., Palzewicz, A., Klawiter, J., Kowalczyk, J.S. and Pajak, J.: (Antidiffusion apparatus for low pressure liquid chromatography). *Pol. Pat.* PL 124,837 (Cl. G01N31/08), 25 Jun. 1985, Appl. 217,652, 09 Aug. 1979; 2 pp.; *C.A.*, 105 (1986) 17445h.

4452 Kita, T.: (Liquid chromatograph column rotation). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,207,054 (85,207,054) (Cl. G01N30/38), 18 Oct. 1985, Appl. 84/64,137, 31 Mar. 1984; 4 pp.; *C.A.*, 104 (1986) 236645f.

4453 Klinkner, R.: (Standard equipment in high performance liquid chromatography). *GIT Fachz. Lab.*, 30 (1986) 180-188; *C.A.*, 104 (1986) 236244z.

4454 Ma, X., Wang, W. and Fan, Y.: A new injection technique in microcolumn liquid chromatography-cut injection. *Sepu*, 4 (1986) 101-103; *C.A.*, 105 (1986) 17248w.

4455 Oda, N., Morita, H. and Matsushita, N.: (Process control in chromatographic separation). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 50,607 (86 50,607) (Cl. B01D15/08), 12 Mar. 1986, Appl. 84/169,106, 13 Aug. 1984; 5 pp.; *C.A.*, 104 (1986) 227103a.

4456 Schwartz, H.E.: Teflon-sheathed, fused silica connecting tubing for use in microbore HPLC. *J. Chromatogr. Sci.*, 24 (1986) 285-288.

4457 Sefecka, R.: A contemporary liquid chromatograph. *Int. Lab.*, 16, No. 4 (1986) 78-87.

4458 Seki, H.: Sample injection device for liquid chromatography. *Ger. Offen. Pat.* DE 3,533,610 (Cl. G01N30/16), 27 Mar. 1986, JP Appl. 84/199,255, 21 Sep. 1984; 11 pp.; *C.A.*, 104 (1986) 236525s.

For additional information see:
C.A., 105 (1986) 7123n, 17475u, 17567z, 26294k.

See also 4488, 4494, 4498, 4504, 5123.

3b. Detectors and detection reagents

4459 Collette, T.W., Parekh, N.J., Griffin, J.H., Carreira, L.A. and Rogers, L.B.: Sensitive photothermal deflection detector for microbore liquid chromatography. *Appl. Spectrosc.*, 40 (1986) 164-169; *C.A.*, 104 (1986) 236558e.

4460 Maris, F.A., van Delft, R.J., Frei, R.W., Geerdink, R.B. and Brinkman, U.A.T.: On-line thermionic detection for narrow-bore reversed-phase liquid chromatography. *Anal. Chem.*, 58 (1986) 1634-1638.

4461 Pfeffer, W.D. and Yeung, E.S.: Laser two-photon excited fluorescence detector for microbore liquid chromatography. *Anal. Chem.*, 58 (1986) 2103-2105.

4462 Van Nieuwkerk, H.J., Veltkamp, A.C., Das, H.A., Brinkman, U.A.T. and Frei, R.W.: Characterization of β-detector for on-line radiometry in high performance liquid chromatography. *J. Radioanal. Nucl. Chem.*, 100 (1986) 165-176; *C.A.*, 104 (1986) 232591n.

4463 Van Vliet, H.P.M., Bruin, G.J.M., Kraak, J.C. and Poppe, H.: Post-column reaction detection for open-tubular liquid chromatography using laser-induced fluorescence. *J. Chromatogr.*, 363 (1986) 187-198.

For additional information see:
C.A., 104 (1986) 179642b, 182739u;
105 (1986) 17236r, 34649v, 34841b, 34869s.

See also 4543, 4650, 4669, 4930, 4964, 5145.

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4464 Anonymous (S.A.B.): Liquid chromatography columns. *Anal. Chem.*, 58 (1986) 876A-878A.

4465 Anselme, M., Cholin, S., Haquet, A., Sebille, B. and Piquion, J.: (Chemical modification of porous silica for protein size exclusion chromatography). *Bull. Soc. Chim. Fr.*, (1985) 1115-1118; *C.A.*, 104 (1986) 221517s.

4466 Cooper, W.T. and Li, L.-Y.: Effects of stationary-phase polarity on retention in reversed bonded phase HPLC columns. *Chromatographia*, 21 (1986) 335-341.

4467 De Galan, L. and Billiet, H.A.H.: Mobile phase optimization in RPLC by an interative regression design. *Adv. Chromatogr. (N.Y.)*, 25 (1986) 63-104; *C.A.*, 104 (1986) 236549c - a review with 41 refs.

4468 Diop, A., Jardy, A., Caude, M. and Rosset, R.: (Use of benzenepolycarboxylate buffers in ion chromatography. I. Influence of pH on the charge of the eluting species). *Analusis*, 14 (1986) 67-73; *C.A.*, 105 (1986) 17550p.

4469 Dumas, C., Caude, M. and Rosset, R.: Determination of methyl-*tert.*-butyl ether solvent strength on silica gel by liquid chromatography. *Analusis*, 14 (1986) 131-138; *C.A.*, 105 (1986) 34866p.

4470 England, E.: *Hydrophobic interaction chromatography*. *Lab. Pract.*, 35 (1986) 64, 67; *C.A.*, 104 (1986) 221518t.

4471 Huang, D. and Qiu, Z.: (Microbore and capillary anion exchange columns packed with polyallylamine-coated silica gel). *Sepu*, 4 (1986) 92-94; *C.A.*, 105 (1986) 17570v.

4472 Johansson, B.-L. and Jansson, O.: Column lifetime of a new agarose medium for *hydrophobic interaction chromatography*. *J. Chromatogr.*, 363 (1986) 387-390.

4473 Joseph, J.M.: Selectivity of poly(styrene-divinylbenzene) column. *ACS Symp. Ser.*, 297 (1986) 83-100; *C.A.*, 104 (1986) 230543z.

4474 Landgrebe, M.E., Wu, D. and Walters, R.R.: Preparation of chromatographic supports of variable ligand density. *Anal. Chem.*, 58 (1986) 1607-1611.

4475 Lochmuller, C.H. and Hill, W.B.: Manipulation of stationary-phase acid-base properties by a surface-buffering effect. Boronic acid-saccharide complexation. *ACS Symp. Ser.*, 297 (1986) 210-225; *C.A.*, 105 (1986) 17540k.

4476 Lu, P., Liu, R. and Dou, L.: Selection of optimal mobile phase composition in HPLC. *LC-GC*, 4 (1986) 354-355; *C.A.*, 104 (1986) 236601p.

4477 Mori, S. and Kato, M.: High-performance aqueous size-exclusion chromatography with diol-bonded porous glass packing materials. *J. Chromatogr.*, 363 (1986) 217-222.

4478 Reed, G.D. and Cunion, K.M.: Retention of 3 μm reversed-phase packings under acidic mobile phase conditions. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 364-365.

4479 Rehak, V.: Column-packing structure and performance. *ACS Symp. Ser.*, 297 (1986) 56-67; *C.A.*, 105 (1986) 17539s.

For additional information see:
C.A., 104 (1986) 182890m, 182891n, 182898v, 182899w, 182900q, 182901r, 182903t, 203503e, 221663m;
105 (1986) 7117p, 8407v, 17572x, 21315h, 25141w, 34816x.

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4480 Anonymous (S.A.B.): Detection limits. *Anal. Chem.*, 58 (1986) 986A.
4481 Pauls, R.E., McCoy, R.W., Ziegel, E.R., Wolf, T., Fritz, G.T. and Marmion, D.M.: Results of a cooperative study comparing the precision of peak height and area measurements in liquid chromatography. Part II. *J. Chromatogr. Sci.*, 24 (1986) 273-277.

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4482 Clonis, Y.D., Jones, K. and Lowe, C.R.: Process scale high-performance liquid affinity chromatography. *J. Chromatogr.*, 363 (1986) 31-36.
4483 Cowan, G.H., Gosling, I.C., Laws, J.F. and Sweetenham, W.P.: Physical and mathematical modelling to aid scale-up of liquid chromatography. *J. Chromatogr.*, 363 (1986) 37-56.
4484 Know, J.H. and Pyper, H.M.: Framework for maximizing throughput in preparative liquid chromatography. *J. Chromatogr.*, 363 (1986) 1-30 - a review with 27 refs.
4485 Tambute, A., Gareil, P., Caude, M. and Rosset, R.: Preparative separation of racemic tertiary phosphine oxides by chiral high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 81-93.

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4486 Yuan, W., Xu, G., Wu, Q., Zeng, F. and Liu, H.: (An automatic optimization procedure in multistage gradient elution). *Sepu*, 2 (1985) 335-338; *C.A.*, 104 (1986) 236588q.

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4. SPECIAL TECHNIQUES

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4487 Heaton, M.G. and Kutchins, L.A.: Advances in human-computer interfacing: the fourth generation of chromatographic software. *Am. Lab. (Fairfield)*, 18 (1986) 128-139; *C.A.*, 105 (1986) 17211d - a review with 5 refs.
4488 Krohn, J. and Verillon, F.: Fraction collectors in automatic preparative HPLC systems. *Int. Lab.*, 16, No. 5 (1986) 46-53.
4489 Mansfield, P., Berthrong, P., Kipiniak, W., Wheaton, S., Voelkner, R. and Karlan, D.: Automation systems for small laboratories: Part one. A third-generation chromatography automation system. *Int. Lab.*, 16, No. 5 (1986) 54-61.
4490 Schipper, W.: (Modern data processing in chromatographic laboratories through LAN (Local-area-network). Part 1. Interface, description and functions). *Chem. Labor. Betr.*, 37 (1986) 114-116; *C.A.*, 104 (1986) 185590z.

4491 Sekulic, S., Haddad, P.R. and Lamberton, C.J.: Computer-assisted selection of mobile phase composition in reversed-phase liquid chromatography. Definition of the optimization search area. *J. Chromatogr.*, 363 (1986) 125-138.
4492 Van Antwerp, J. and Venteicher, R.F.: Improving the flexibility of an analytical robotic system. *LC-GC*, 4 (1986) 458-460; *C.A.*, 105 (1986) 17281b.
4493 Van de Wijdeven, B., Lakeman, J., Klaessens, J., Vandeginste, B. and Kateman, G.: Digital simulation as an aid to sample scheduling in a routine laboratory for liquid chromatography. *Anal. Chim. Acta*, 184 (1986) 151-164.
4494 Yoshihara, T.: (Data processing apparatus for chromatography). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,142,255 (85,142,255) (Cl. G01N30/86), 27 Jul. 1985, Appl. 83/245,871, 29 Dec. 1983; 5 pp.; *C.A.*, 104 (1986) 236643d.

For additional information see:
C.A., 105 (1986) 34843d.

See also 4446, 4504, 4662, 5046.

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4495 Raglione, T.V., Sagliano, N., Jr., Floyd, T.R. and Hartwick, R.A.: Multi-dimensional LC-LC and LC-GC separations. *LC-GC*, 4 (1986) 328-338; *C.A.*, 104 (1986) 236552y - a review with 24 refs.

4c. Combination with other physico-chemical techniques (MS, IR etc.)

4496 Buetfering, L., Schmelzeisen-Radeker, G. and Roellgen, F.W.: A dual beam thermospray vaporizer for online HPLC-mass spectrometry coupling. *J. Chem. Soc., Chem. Commun.*, (1986) 579-580; *C.A.*, 105 (1986) 32607f.
4497 Griffiths, P.R. and Conroy, C.M.: Solvent elimination techniques for HPLC/FT-IR. *Adv. Chromatogr. (N.Y.)*, 25 (1986) 105-138; *C.A.*, 104 (1986) 236252a - a review with 30 refs.
4498 Johnson, C.C. and Taylor, L.T.: Liquid chromatography/Fourier transform IR spectrometry interface flow cell. *U.S. Pat.* Appl. US 689,104, 31 Jan. 1986, Appl. 04 Jan. 1985; 34 pp.; *C.A.*, 105 (1986) 17610h.
4499 Niessen, W.M.A.: A review of direct liquid introduction interfacing for LC/MS. Part II. Mass spectrometry and applications. *Chromatographia*, 21 (1986) 342-354 - a review with 82 refs.
4500 Parker, C.E., Smith, R.W., Gaskell, S.J. and Bursey, M.M.: Dependence of ion formation upon the ionic additive in thermospray liquid chromatography/negative ion mass spectrometry. *Anal. Chem.*, 58 (1986) 1661-1664.

For additional information see:
C.A., 105 (1986) 17262w.

See also 4528, 4551, 4679.

4d. Affinity chromatography

4501 Wnag, Y., Shen, G. and Meng, Z.: (Preparation of Con A-Sepharose 4B for affinity chromatography). *Huaxue Shiji*, 8 (1986) 54-56; *C.A.*, 104 (1986) 221524s.
4502 Yamasaki, M.: (Affinity chromatography). *Kagaku to Kogyo (Tokyo)*, 37 (1984) 290-293; *C.A.*, 104 (1986) 236246b - a review with 6 refs.

For additional information see:
C.A., 104 (1986) 203258d.

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4503 Borra, C., Di Corcia, A., Marchetti, M. and Samperi, R.: Evaluation of graphitized carbon black cartridges for rapid organic trace enrichment from water: Application to priority pollutant phenols. *Anal. Chem.*, 58 (1986) 2048-2052.

4504 Lim, C.K., Li, F. and Peters, T.J.: Clinical applications of an advanced automated smaple processor. *Int. Lab.*, 16, No. 6 (1986) 60-65.

For additional information see:
C.A., 104 (1986) 236344g.

See also 4933, 5135.

4g. Separation of enantiomers

4505 Balani, S.K., van Bladeren, P.J., Shirai, N. and Jerina, D.M.: Resolution and absolute configuration of K-region trans dihydrodiols from polycyclic aromatic hydrocarbons. *J. Org. Chem.*, 51 (1986) 1773-1778; *C.A.*, 104 (1986) 206397j.
4506 Lipkowitz, K., Landwer, J.M. and Darden, T.: Theoretical studies of a chiral stationary phase used in column chromatography. *Anal. Chem.*, 58 (1986) 1611-1617.
4507 Okamoto, Y., Kawashima, M. and Hatada, K.: Chromatographic resolution. XI. Controlled chiral recognition of cellulose triphenylcarbamate derivatives supported on silica gel. *J. Chromatogr.*, 363 (1986) 173-186.
4508 Wainer, I.W., Barkan, S.A. and Schill, G.: α_1-Acid glycoprotein chiral stationary phase. HPLC application to the resolution of enantiomeric drugs. *LC-GC*, 4 (1986) 422-430; *C.A.*, 105 (1986) 30133z - a review with 15 refs.

See also 4485, 4668, 4672, 4677, 4706, 4833, 5005, 5010, 5047, 5050, 5115.

4h. Other special techniques

4509 Giddings, J.C.: Cyclical-field field-flow fractionation: A new method based on transport rates. *Anal. Chem.*, 58 (1986) 2052-2056.
4510 Hirose, A. and Ishii, D.: Use of a peristaltic pump for recycling chromatography with a microcolumn. *J. Chromatogr.*, 363 (1986) 391-393.
4511 Ito, Y.: Trends in countercurrent chromatography. *TrAC*, 5 (1986) 142-147 - a review with 15 refs.
4512 Poppe, L. and Novak, L.: (Preparative vacuum chromatography: A simple and rapid separation method). *Magy. Kem. Lapja*, 40 (1985) 366-369; *C.A.*, 105 (1986) 23911y.

For additional information see:
C.A., 104 (1986) 226787q.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5a. Aliphatic hydrocarbons

4513 Mabrouk, S.T., Dark, W.A. and Ellison, H.R.: The solvent-temperature dependence of GPC separation of organic compounds. *J. Chromatogr. Sci.*, 24 (1986) 293-301.

5b. Cyclic hydrocarbons

4514 Colmsjö, A.L. and Ericsson, M.W.: Synthesis and evaluation of selective reversed phase packing materials for HPLC. *Chromatographia*, 21 (1986) 392-396.
4515 Hopia, A., Pyysalo, H. and Wickström, K.: Margarines, butter and vegetable oils as sources of polycyclic aromatic hydrocarbons. *J. Am. Oil Chem. Soc.*, 63 (1986) 889-893.
4516 Lawrence, J.F. and Das, B.S.: (Determination of nanogram/kilogram levels of polycyclic aromatic hydrocarbons in foods by HPLC with fluorescence detection). *Int. J. Environ. Anal. Chem.*, 24 (1986) 113-131; *C.A.*, 104 (1986) 223710y.
4517 Modly, C.E., Das, M., Don, P.S.C., Marcelo, C.L., Mukhtar, H. and Bickers, D.R.: Capsaicin as *in vitro* inhibitor of benzo[*a*]pyrene metabolism and its DNA binding in human and murine keratinocytes. *Drug Metab. Disp.*, 14 (1986) 413-416.
4518 Musial, C.J. and Uthe, J.F.: Rapid, semimicro method for determination of polycyclic aromatic hydrocarbons in shellfish by automated gel permeation/liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 462-466.

4519 Pathiratne, A., Puyear, R.L. and Brammer, J.D.: Activation of ^{14}C-toluene to covalently binding metabolites by rat liver microsomes. *Drug Metab. Disp.*, 14 (1986) 386-391.
4520 Platt, K.L., Reischmann, I., Flenner, C. and Gesch, F.: Isolation, separation and quantification of metabolites of the carcinogenic polycyclic aromatic hydrocarbons dibenz[*a*,*h*]anthracene. *Fresenius' Z. Anal. Chem.*, 324 (1986) 357.
4521 Pruess-Schwartz, D., Baird, W.M., Nikbakht, A., Merrick, B.A. and Selkirk, J.K.: Benzo[*a*]pyrene:DNA adduct formation in normal human mammary epithelial cell cultures and the human mammary carcinoma T47D cell line. *Cancer Res.*, 46 (1986) 2697-2702.
4522 Salhab, A.S., James, M.O., Wang, S.-L. and Shiverick, K.T.: Positional metabolism of benzo[*a*]pyrene in rat placenta and maternal liver. Comparison of induction effects. *Drug Metab. Disp.*, 14 (1986) 471-476.
4523 Sander, L.C. and Wise, S.A.: Investigations of selectivity in RPLC of polycyclic aromatic hydrocarbons. *Adv. Chromatogr. (n.Y.)*, 25 (1986) 139-218; *C.A.*, 104 (1986) 236550w - a review with 69 refs.
4524 Thakker, D.R., Levin, W., Yagi, H., Yeh, H.J. C., Ryan, D.E., Thomas, P.E., Conney, A.H. and Jerina, D.M.: Stereoselective metabolism of the (+)-(S,S)- and (-)-(R,R)-enantiomers of trans-3,4-dihydroxy-3,4-dihydrobenzo[*c*]-phenanthrene by rat and mouse liver microsomes and by a purified and reconstituted cytochrome P-450 system. *J. Biol. Chem.*, 261 (1986) 5404-5413.
4525 Welch, K.J. and Hoffman, N.E.: HPLC with electron-acceptor groups bonded to mercaptopropyl silica. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 417-419.

For additional information see:
C.A., 104 (1986) 236605t.

See also 4444, 4505, 4513, 5008.

5c. Halogen derivatives

See 4923.

5d. Complex hydrocarbon mixtures

For additional information see:
C.A., 105 (1986) 12744v.

6. ALCOHOLS

4526 Binder, H., Weber, P.C. and Siess, W.: High-performance liquid chromatography - a suitable method to separate inositol phosphates and glycerophosphoinositol phosphates. *Fresenius' Z. Anal. Chem.*, 324 (1986) 341-342.
4527 Kubo, I., Komatsu, S., Iwagawa, T. and Wood, D.L.: Analytical and preparative separation of bark beetle pheromones by high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 309-314.
4528 Lai, S.-T.: Characterization and molecular weight determination of water-soluble polyethyleneglycol oligomers using open-tubing liquid chromatography-mass spectrometry. *J. Chromatogr.*, 363 (1986) 444-447.

See also 4519.

7. PHENOLS

4529 Okuda, T., Yoshida, T., Hatano, T., Yazaki, K., Kira, R. and Ikeda, Y.: Chromatography of tannins. II. Preparative fractionation of hydrolyzable tannins by centrifugal partition chromatography. *J. Chromatogr.*, 362 (1986) 375-381.

4530 Verzele, M., Delahaye, P. and van Damme, F.: Determination of the tanning capacity of tannic acids by high-performance liquid chromatography. *J. Chromatogr.*, 362 (1986) 363-374.
4531 Yoshikawa, M., Taguchi, Y., Arashidani, K. and Kodama, Y.: Determination of cresols in urine by high-performance liquid chromatography. *J. Chromatogr.*, 362 (1986) 425-429.

For additional information see:
C.A., 104 (1986) 185626r;
105 (1986) 8163n, 23153c.

See also 4503, 4519, 4524, 4632.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

8b. Aflatoxins and other mycotoxins

4532 Hsieh, D.P.H., Beltran, L.M., Fukayama, M.Y., Rice, D.W. and Wong, J.J.: Production and isolation of aflatoxin M_1 for toxicological studies. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 510-512.
4533 Verbiese-Genard, N. and Hanocq, M.: Detection of fraudulent use of zearanol and natural occurence of zearalenone in cattle urine by high performance liquid chromatography. *Anal. Lett.*, 19 (1986) 1229-1241.

For additional information see:
C.A., 104 (1986) 223477c;
105 (1986) 1742s.

See also 4538.

8c. Other compounds with heterocyclic oxygen

4534 Chonan, T.: (Determination of 5-(hydroxymethyl)-2-furfural in UHT-sterilized milk by HPLC). *Rakuno Kagaku, Shokuhin No Kenkyu*, 35 (1986) A1-A4; *C.A.*, 104 (1986) 205638b.
4535 Noguchi, T., Jeon, J.-K., Arakawa, O., Sugita, H., Deguchi, Y., Shida, Y. and Hashimoto, K.: Occurrence of tetrodotoxin and unhydrotetrodotoxin in *Vibrio* sp. isolated from the intestines of a xanthid crab, *Atergatis floridus*. *J. Biochem. (Tokyo)*, 99 (1986) 311-314.

9. OXO COMPOUNDS, ETHERS AND EPOXIDES

4536 Bloeck, S., Kreis, A. and Stanek, O.: (Comparative determination of aldehydes and ketones in apple juice after 2 years storage in inner protected aluminum and tin cans of 4-20°C). *Alimenta*, 25 (1986) 23-28; *C.A.*, 105 (1986) 23157g.
4537 Chaurasia, N. and Wichtl, M.: Phenylpropane und Lignane aus der Wurzel von *Urtica dioica* L. *Dtsch. Apoth.-Ztg.*, 126 (1986) 1559-1563.
4538 Johnson, L.A., Farnsworth, J.T., Sadek, N.Z., Chamkasem, N., Lusas, E.W. and Reid, B.L.: Pilot plant studies on extracting cottonseed with methylene chloride. *J. Am. Oil Chem. Soc.*, 63 (1986) 647-652.
4539 Yoshino, K., Matsuura, T., Sano, M., Saito, S.-I. and Tomita, T.: Fluorometric liquid chromatographic determination of aliphatic aldehydes arising from lipid peroxides. *Chem. Pharm. Bull.*, 34 (1986) 1694-1700.

10. CARBOHYDRATES

10a. Mono and oligosaccharides. Structural studies

4540 Brockhausen, I., Matta, K.L., Orr, J., Schachter, H., Koenderman, A.H.L. and van den Eijnden, D.H.: Mucin synthesis. Conversion of R_1-ß$_1$-3Gal-R_2 to R_1-ß$_1$-3(GlcNAcß1-6)Gal-R_2 and of R_1-ß$_1$-3GalNAc-R_2 to R_1-ß$_1$-3(GlcNAc1-6)GalNAc-R_2 by a ß6-N-acetylglucosaminyltransferase in pig gastric mucosa. *Eur. J. Biochem.*, 157 (1986) 463-474.

4541 Christ, B., Probst, I. and Jungermann, K.: Antagonistic regulation of the glucose/glucose 6-phosphate cycle by insulin and glucagon in cultured hepatocytes. *Biochem. J.*, 238 (1986) 185-191.

4542 Couso, R., Lang, L., Roberts, R.M. and Kornfeld, S.: Phosphorylation of the oligosaccharide of uteroferrin by UDP-GlcNAc:glycoprotein N-acetylglucosamine-1-phosphotransferases from rat liver, *Acanthamoeba castellani*, and *Dictyostelium discoideum* requires α1,2 linked mannose residues. *J. Biol. Chem.*, 261 (1986) 6326-6331.

4543 Cowie, C.E., Haddad, P.R. and Alexander, P.W.: The determination of reducing carbohydrates using a cation-exchange column and potentiometric detection with a metallic copper electrode. *Chromatographia*, 21 (1986) 417-419.

4544 Dakour, J., Hansson, G.C., Lunblad, A. and Zopf, D.: Separation and partial sequence analysis of blood group A-active oligosaccharides by affinity chromatography using monoclonal antibodies. *Arch. Biochem. Biophys.*, 248 (1986) 677-683.

4545 Den Drijver, L. and Holzapfel, C.W.: Separation and quantitative determination of the radiolysis products of D-fructose as their O-benzyloximes. *J. Chromatogr.*, 363 (1986) 345-352.

4546 Den Drijver, L., Holzapfel, C.W. and van der Linde, H.J.: High-performance liquid chromatographic determination of D-*arabino*-hexos-2-ulose(D-glucosone) in irradiated sugar solutions: application of the method to irradiated mango. *J. Agric. Food Chem.*, 34 (1986) 758-762.

4547 Goso-Kato, K., Iwase, H., Ishihara, K. and Hotta, K.: Analysis of reduced oligosaccharides by combined use of gel chromatography and high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 374-378.

4548 Grossi, M., Micco, C., Chirico, M. and Arnoldi, C.: (Sugar determination in soft wheat flours by GLC and HPLC). *Riv. Soc. Ital. Sci. Aliment.*, 14 (1985) 429-434; *C.A.*, 104 (1986) 223703y.

4549 Hanai, T.: Liquid chromatography of carbohydrates. *Adv. Chromatogr. (N.Y.)*, 25 (1986) 279-307; *C.A.*, 104 (1986) 236551x - a review with 258 refs.

4550 Hase, S., Sugimoto, T., Takemoto, H., Ikenaka, T. and Schmid, K.: The structure of sugar chains of Japanese quail ovomucoid. The occurence of oligosaccharides not expected from the classical biosynthetic pathway for N-glycans; a method for the assessment of the structure of glycans present in picomolar amounts. *J. Biochem. (Tokyo)*, 99 (1986) 1725-1733.

4551 Hsu, F.F., Edmonds, C.G. and McCloskey, J.A.: Combined liquid chromatography-mass spectrometry for microscale structural studies of carbohydrates. *Anal. Lett.*, 19 (1986) 1259-1271.

4552 Jakovljevic, J.B., Nikolov, Z.L. and Boskov, Z.M.: Some analytical aspects of enzyme degradation of starch and inulin into malto- and fructooligosaccharides. *Nahrung*, 30 (1986) 171-176; *C.A.*, 104 (1986) 205619w.

4553 Krauss, G.-J., Leinhos, V. and Glund, K.: Highly specific isocratic HPLC of UDP-glucose. *Fresenius' Z. Anal. Chem.*, 324 (1986) 337.

4554 Ohsawa, K., Yoshimura, Y., Watanabe, S., Tanaka, H., Yokota, A., Tamura, K. and Imaeda, K.: Determination of xylitol in the human serum and saliva by ion chromatography with pulsed amperometric detection. *Anal. Sci.*, 2 (1986) 165-168; *C.A.*, 105 (1986) 17715w.

4555 Sarkar, M. and Mookerjea, S.: Recovery of dolichyl diphosphate oligosaccharide *in methanolic aqueous phase prepared from rat liver microsomal fractions.* *Biochem. J.*, 236 (1986) 913-916.

4556 Schweden, J., Legler, G. and Bause, E.: Purification and characterization of a neutral processing mannosidase from calf liver acting on $(Man)_9(GlcNAc)_2$ oligosaccharides. *Eur. J. Biochem.*, 157 (1986) 563-570.

For additional information see:
C.A., 105 (1986) 17625s.

See also 5162.

10b. Polysaccharides, mucopolysaccharides, lipopolysaccharides

4557 Ahmed, H., Chatterjee, B.P., Kelm, S. and Schauer, R.: Purification of a sialic acid-specific lectin from the Indian scorpion *Heterometrus granulomanus*. *Biol. Chem. Hoppe-Seyler*, 367 (1986) 501-506.

4558 Cockin, G.H., Huckerby, T.N. and Nieduszynski, I.A.: High-field NMR studies of keratan sulphates. ^1H and ^{13}C assignments of keratan sulphate from shark cartilage. *Biochem. J.*, 236 (1986) 921-924.

4559 Funae, Y., Wada, S., Imaoka, S., Hirotsune, S., Tominaga, M., Tanaka, S., Kishimoto, T. and Maekawa, M.: Chromatographic separation of α_1-acid glycoprotein from α_1-antitrypsin by high-performance liquid chromatography using a hydroxyapatite column. *J. Chromatogr.*, 381 (1986) 149-152.

4560 Furukawa, K., Minor, J.E., Hegarty, J.D. and Bhavanandan, V.P.: Interaction of sialoglycoproteins with wheat germ agglutinin-Sepharose of varying ratio of lectin to Sepharose. Use for the purification of mucin glycoproteins from membrane extracts. *J. Biol. Chem.*, 261 (1986) 7755-7761.

4561 Gross, V., Tran-Thi, T.-A., Schwarz, R.T., Elbein, A.D., Decker, K. and Heinrich, P.C.: Different effects of the glucosidase inhibitors 1-deoxynojirimycin, N-methyl-1-deoxynojirimycin and castanospermine on the glycosylation of rat α_1-proteinase inhibitor and α_1-acid glycoprotein. *Biochem. J.*, 236 (1986) 853-860.

4562 Hughes, R.C. and Feeney, J.: Ricin-resistant mutants of baby-hamster-kidney cells deficient in α-mannosidase-II-catalyzed processing of asparagine-linked oligosaccharides. *Eur. J. Biochem.*, 158 (1986) 227-237.

4563 Jordan, R.E. and Marcum, J.A.: Anticoagulantly active heparin from clam *(Mercenaria mercenaria)*. *Arch. Biochem. Biophys.*, 248 (1986) 690-695.

4564 King, I.A., Tabiowo, A. and Pope, F.M.: A lectin-binding glycoprotein of M_r 135000 associated with basal keratinocytes in pig epidermis. *Biochem. J.*, 237 (1986) 405-414.

4565 Kolset, S.O., Ehlorsson, J., Kjellen, L. and Lindahl, U.: Effect of benzyl β-D-xyloside on the biosynthesis of chondroitin sulphate proteoglycan in cultured human monocytes. *Biochem. J.*, 238 (1986) 209+216.

4566 Lories, V., David, G., Cassiman, J.-J. and van den Berghe, H.: Heparan sulfate proteoglycans of human lung fibroblasts. Occurence of distinct membrane, matrix and secreted forms. *Eur. J. Biochem.*, 158 (1986) 351-360.

4567 Mononen, I.: Detection of sialuria by cation-exchange high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 219-224.

4568 Müller, B.W. and Brauns, U.: Hydroxypropyl-β-cyclodextrin derivatives influence of average degree of substitution on complexing ability and surface activity. *J. Pharm. Sci.*, 75 (1986) 571-572.

4569 Paulsen, B.S., Wold, J.K., Ottersen, S., Mellbye, K.S. and Barlo, T.: Preparative fractionation of carbohydrate-rich components present in germ-free rat intestinal mucin by gel filtration. Comparison of Dynospheres^R XP-3505 and Sepharose CL 4B. *J. Chromatogr.*, 363 (1986) 105-110.

4570 Rosen, S.W., Calvert, I., Lee, N., Bohn, H., Papadopoulos, N. and Osborne, J.C., Jr.: Oligomerization of pregnancy-specific β_1-glycoprotein (SP_1) at physiologic pH and ionic strength. *Clin. Chim. Acta*, 157 (1986) 65-72.

4571 Rosenfeld, L. and Danishefsky, I.: A fragment of antithrombin that binds both heparin and thrombin. *Biochem. J.*, 237 (1986) 639-646.

4572 Satoh, T., Kan, M., Kato, M. and Yamane, I.: Purification and characterization of an endothelial cell growth factor from serum-free culture medium of human diploid fibroblast cells. *Biochim. Biophys. Acta*, 887 (1986) 86-93.

4573 Schmelzer, C.H. and Poduslo, S.E.: Purification and characterization of two glycoproteins from oligodendroglial plasma membranes. *Biochim. Biophys. Acta*, 858 (1986) 56-66.

4574 Wantyghem, J., Goulut, C., Frenoy, J.-P., Turpin, E. and Goussault, Y.: Purification and characterization of *Robinia pseudoacacia* seed lectins. A re-investigation. *Biochem. J.*, 237 (1986) 483-489.

For additional information see:
C.A., 105 (1986) 21162f, 21163g.

See also 4736, 4752.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

4575 Appanna, V.D. and Viswanatha, T.: High-performance liquid chromatographic method for monitoring aerobactin synthetase activity. *J. Chromatogr.*, 363 (1986) 323-328.

4576 Bandi, Z.L. and Ansari, G.A.S.: High-performance liquid chromatographic analysis of saturated monohydroxy fatty acid mixtures containing positional isomers of various chain-lengths. *J. Chromatogr.*, 363 (1986) 402-406.

4577 Blumenthal, M.M. and Stockler, J.R.: Isolation and detection of alkaline contaminant materials (ACM) in used frying oils. *J. Am. Oil Chem. Soc.*, 63 (1986) 687-688.

4578 Chiu, G.: Separation of carboxylic acids by temperature programmed liquid chromatography. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 410-411.

4579 Christopoulou, C.N. and Perkins, E.G.: High performance size exclusion chromatography of fatty acids, mono-, di- and triglyceride mixtures. *J. Am. Oil Chem. Soc.*, 63 (1986) 679-684.

4580 De Spiegeleer, B., Slegers, G. and van den Bossche, W.: Rapid determination of malonic acid by ion-pair reversed-phase high-performance liquid chromatography. *J. Pharm. Biomed. Anal.*, 4 (1986) 411-413.

4581 Elliott, W.J., Morrison, A.R., Sprecher, H. and Needleman, P.: Calcium-dependent oxidation of 5,8,11-eicosatrienoic acid by the cyclooxygenase enzyme system. *J. Biol. Chem.*, 261 (1986) 6719-6724.

4582 Fujimura, K. and Tsuchiya, M.: (Analysis of organic acids for discrimination of imported wines by ion chromatography). *Bunseki Kagaku*, 35 (1986) T50-T56.

4583 Ghiggeri, G.M., Candiano, G., Delfino, G., Queirolo, C., Ginevri, F., Perfumo, F. and Gusmano, R.: Separation of the 9-anthryldiazomethane derivatives of fatty acids by high-performance liquid chromatography on a Fatty Acid Analysis Column^{R}. Application to albumin-bound fatty acid analysis. *J. Chromatogr.*, 381 (1986) 411-418.

4584 Goycoolea, M., Seelenfreund, D., Rottimann, C., Gonzales, B. and Vicuna, R.: Monitoring bacterial consumption of low molecular weight lignin derivatives by high performance liquid chromatography. *Enzyme Microb. Technol.*, 8 (1986) 213-216; *C.A.*, 104 (1986) 203303q.

4585 Haeggström, J., Meijer, J. and Radmark, O.: Leukotriene A_4. Enzymatic conversion into 5,6-dihydroxy-7,9,11,14-eicosatetraenoic acid by mouse liver cytosolic epoxide hydrolase. *J. Biol. Chem.*, 261 (1986) 6332-6337.

4586 Haginaka, J., Wakai, J. and Yasuda, H.: Liquid chromatographic assay of clavulanic acid using a hollow-fiber postcolumn reactor. *Chem. Pharm. Bull.*, 34 (1986) 1850-1852.

4587 Hatsumi, M., Kimata, S.-i. and Hirosawa, K.: Microanalysis of free fatty acids in plasma of experimental animals and humans by high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 247-255.

4588 Hresko, R.C., Markello, T.C., Barenholz, Y. and Thompson, T.E.: Purification and spectroscopic properties of pyrene fatty acids. *Chem. Phys. Lipids*, 38 (1985) 263-273; *C.A.*, 105 (1986) 23873n.

4589 Ivanov, A.A., Shpigun, O.A. and Zolotov, Yu.A.: (Ion chromatography of organic carboxylic acids. Determination of monobasic carboxylic and hydroxy acids). *Zh. Anal. Khim.*, 41 (1986) 134-139; *C.A.*, 105 (1986) 17580y.

4590 Kieber, D.J. and Mopper, K.: Trace determination of α-keto acids in natural waters. *Anal. Chim. Acta*, 183 (1986) 129-140.

4591 Lanneluc-Sanson, D., Phan, C.T. and Granger, R.: Analysis by reverse-phase high-pressure liquid chromatography of phenylisothiocyanate-derivatized 1-amino-cyclopropane-1-carboxylic acid in apple extracts. *Anal. Biochem.*, 155 (1986) 322-327.

4592 Martillotti, F. and Puppo, S.: (High-resolution liquid chromatographic determination of organic acids in silages and rumen fluids). *Ann. Ist. Sper. Zootec.*, 18 (1985) 1-10; *C.A.*, 104 (1986) 223707c.

4593 Panari, G.: HPLC of organic acids: An approach to cheese analysis. *Milchwissenschaft.*, 41 (1986) 214-216; *C.A.*, 105 (1986) 5246f.

4594 Shilling, D.G., Jones, L.A., Worsham, A.D., Parker, C.E. and Wilson, R.F.: Isolation and identification of some phytotoxic compounds from aqueous extracts of rye (*Secale cereale* L.). *J. Agric. Food Chem.*, 34 (1986) 633-638.

4595 Teubner, J.K., Halls, H.J. and Walmsley, R.N.: Components of the plasma anion gap. I. Separation and quantification of plasma organic acids by HPLC. *Fresenius' Z. Anal. Chem.*, 324 (1986) 330-331.

4596 Winter, M. and Herrmann, K.: Esters and glucosides of hydroxycinnamic acids in vegetables. *J. Agric. Food Chem.*, 34 (1986) 616-620.

4597 Yamaguchi, M., Matsunaga, R., Fukuda, K., Nakamura, M. and Ohkura, Y.: Highly sensitive determination of free polyunsaturated, long-chain fatty acids in human serum by high-performance liquid chromatography with fluorescence detection. *Anal. Biochem.*, 155 (1986) 256-261.

For additional information see:
C.A., 104 (1986) 221588r, 221668s;
105 (1986) 21165j.

See also 4530, 4645, 4658.

11b. Prostaglandins

4598 Dimov, V., Green, K., Bygdeman, M. and Christensen, N.J.: Metabolism of 16,16-dimethyl-*trans*-Δ^2-prostaglandin E_1 methyl ester (ONO-802) following intravenous and vaginal administration to pregnant women. *Drug Metab. Disp.*, 14 (1986) 494-502.

4599 Kaykaty, M., Weiss, G. and Barbalas, M.: Metabolism of the synthetic prostaglandin alfaprostol in the cow. *J. Agric. Food Chem.*, 34 (1986) 688-694.

4600 Kolis, S.J., Postma, E.J., Williams, T.H. and Sasso, G.J.: Identification of trimoprostil metabolites excreted in rat bile formed by oxidation and taurine conjugation. *Drug Metab. Disp.*, 14 (1986) 465-470.

4601 Kubo, I. and Komatsu, S.: Micro analysis of prostaglandins and ecdysteroids in insects by high-performance liquid chromatography and fluorescence labeling. *J. Chromatogr.*, 362 (1986) 61-70.

4602 Lawson, C., Bunting, S., Holzgrefe, H. and Fitzpatrick, F.: Leukotriene B_4 and 20-hydroxyleukotriene B_4 contract guinea-pig trachea strips *in vitro*. *J. Pharmacol. Exp. Therm.*, 237 (1986) 888-892.

4603 Steffenrud, S.: Metabolism of prostaglandin E analogs in guinea pig and rat liver microsomes. *Eur. J. Drug Metab.*, 11 (1986) 39-50.

4604 Thornburgh, B.A., Shaw, S.R. and Wickrema Sinha, A.J.: Isolation and characterization of urinary metabolites of arbaprostil in the rat. *Eur. J. Drug Metab.*, 11 (1986) 61-69.

4605 Yamaguchi, M., Fukuda, K., Hara, S., Nakamura, M. and Ohkura, Y.: Fluorimetric high-performance liquid chromatography of prostaglandins and its application to their determination in human seminal fluid. *J. Chromatogr.*, 380 (1986) 257-265.

11c. Lipids and their constituents

4606 Ajana, H., Perrin, J.L. and Prevot, A.: (Studies on phospholipid separations from vegetable oils by HPLC-comparison with TLC). *Rev. Fr. Corps Gras*, 33 (1986) 19-26; *C.A.*, 104 (1986) 223708d.

4607 Batra, A., Mehta, B.K. and Bokadia, M.M.: Characterization of *Amaranthus hybridus* phospholipids. *Fette, Seifen, Anstrichm.*, 88 (1986) 189-191.

4608 Chilton, F.H. and Murphy, R.C.: Remodeling of arachidonate-containing phosphoglycerides within the human neutrophil. *J. Biol. Chem.*, 261 (1986) 7771-7777.

4609 Do, U.H. and Lo, S.-L.: Separation of phospholipids using a diethylaminoethyl-silica gel column and thin-layer chromatography. *J. Chromatogr.*, 381 (1986) 233-240.
4610 Fiebig, H.-J.: Hochleistungs-Flüssigkeits-Chromatographie von Triglyceriden. *Fresenius' Z. Anal. Chem.*, 324 (1986) 216.
4611 Hansen, C.A., Mah, S. and Williamson, J.R.: Formation and metabolism of inositol 1,3,4,5-tetrakisphosphate in liver. *J. Biol. Chem.*, 261 (1986) 8100-8103.
4612 Kostyuk, V.A.: Possible ways of lipid peroxide reduction in rate liver and their subcellular localization. *Biokhimiya (Moscow)*, 57 (1986) 1059-1065.
4613 Kurnik, B.R.C., Huskey, M., Hagerty, D. and Hruska, K.A.: Vitamin D metabolites stimulate phosphatidylcholine transfer to renal brush-border membranes. *Biochim. Biophys. Acta*, 858 (1986) 47-55.
4614 Low, M.G., Carroll, R.C. and Cox, A.C.: Characterization of multiple forms of phosphoinositide-specific phospholipase C purified from human platelets. *Biochem. J.*, 237 (1986) 139-145.
4615 Maruyama, K. and Yonese, C.: Separation and quantitative determination of monoacylglycerol mixtures by reversed phase HPLC. *J. Am. Oil Chem. Soc.*, 63 (1986) 902-905.
4616 McCluer, R.H., Ullman, M.D. and Jungalwala, F.B.: HPLC of glycosphingolipids and phospholipids. *Adv. Chromatogr.*, 25 (1986) 309-353; *C.A.*, 104 (1986) 203229v - a review with 98 refs.
4617 Nakagawa, Y. and Waku, K.: Improved procedure for the separation of the molecular species of dimethylphosphatidate by high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 225-231.
4618 Prieto, P.A. and Smith, D.F.: A new ganglioside in human meconium detected with antiserum against human milk sialyltetrasaccharide *a*. *Arch. Biochem. Biophys.*, 249 (1986) 243-253.
4619 Sotirhos, N., Ho, C.T. and Chang, S.S.: Normal and reverse phase HPLC analysis of soybean phospholipids. *Dev. Food Sci.*, 12 (Shelf Life Foods Beverages) (1986) 601-608; *C.A.*, 105 (1986) 23168m.
4620 Whalen, M.M., Wild, G.C., Spall, W.D. and Sebring, R.J.: Separation of underivatized gangliosides by ion exchange HPLC. *Lipids*, 21 (1986) 267-270; *C.A.*, 104 (1986) 203306t.
4621 White, P.J. and Wang, Y.C.: A high performance size-exclusion chromatographic method for evaluating heated oils. *J. Am. Oil Chem. Soc.*, 63 (1986) 914-920.

See also 4579.

11d. Lipoproteins and their constituents

4622 Chino, H. and Yazawa, M.: Apolipophorin III in locusts: purification and characterization. *J. Lipid Res.*, 27 (1986) 377-385.
4623 Johnson, F.L., Babiak, J. and Rudel, L.L.: High density lipoprotein accumulation in perfusates of isolated livers of African green monkeys. Effects of saturated *versus* polyunsaturated dietary fat. *J. Lipid Res.*, 27 (1986) 537-548.
4624 Kushwaha, R.S., Barnwell, G.M., Carey, K.D. and McGill, H.C., Jr.: Metabolism of apoprotein B in selectively bred baboons with low and high levels of low density lipoproteins. *J. Lipid Res.*, 27 (1986) 497-507.
4625 McLeod, R., Lacko, A.G., Pritchard, P.H. and Frohlich, J.: Purification of biologically active apoliproteins by chromatofocussing. *J. Chromatogr.*, 381 (1986) 271-283.
4626 Schwandt, P., Richter, W.O. and Weisweiler, P.: Separation of apolipoprotein B subfractions by high performance gel permeation chromatography. *Clin. Chim. Acta*, 157 (1986) 249-252.
4627 Walsh, M.T. and Atkinson, D.: Physical properties of apoprotein B in mixed micelles with sodium deoxycholate and in a vesicle with dimyristoyl phosphatidylcholine. *J. Lipid Res.*, 27 (1986) 316-325.

For additional information see:
C.A., 104 (1986) 182837z.

See also 4791.

13. STEROIDS

13a. Pregnane and indrostane derivatives

4628 Lagana, A., Rotatori, M., Vinci, G., Perla, C.M. and Curini, R.: Sample-pretreatment procedure for routine liquid chromatographic assay of serum cortisol. *Talanta*, 33 (1986) 325-328; *C.A.*, 105 (1986) 759r.

4629 Orlowski, J. and Clark, A.F.: Androgen metabolism and actions in rat ventral prostate epithelial and stromal cell cultures. *Biochem. Cell Biol.*, 64 (1986) 583-593.

4630 Schöneshöfer, M., Kage, A., Eisenschmid, B., Heilmann, P., Dhar, T.K. and Weber, B.: Automated liquid chromatographic determination of the 20-dihydro isomers of cortisol and cortisone in human urine. *J. Chromatogr.*, 380 (1986) 267-274.

For additional information see:
C.A., 104 (1986) 200325n, 200513x;
105 (1986) 18614z.

13b. Estrogens

4631 Sagara, Y., Okatani, Y., Kiriyama, T. and Takeda, Y.: A rapid, sensitive and quantitative high-performance liquid chromatographic determination of catecholestrogens in human serum. *Asia-Oceania J. Obstet. Gynaecol.*, 11 (1985) 597-604; *C.A.*, 105 (1986) 18616b.

4632 Watanabe, K., Kimura, R. and Yoshizawa, I.: Synthesis and high-performance liquid chromatography of 3,4-guaiacol estrogen 17-sulfates. *Chem. Pharm. Bull.*, 34 (1986) 2231-2235.

13c. Sterols

4633 Akihisa (ne Itoh), T., Ghosh, P., Thakur, S., Rosenstein, F.U. and Matsumoto, T.: Sterol compositions of seeds and mature plants of family *Cucurbitaceae*. *J. Am. Oil Chem. Soc.*, 63 (1986) 653-658.

4634 Higley, N.A., Taylor, S.L., Herian, A.M. and Lee, K.: Cholesterol oxides in processed meats. *Meat Sci.*, 16 (1986) 175-188; *C.A.*, 104 (1986) 205722z.

4635 Maerker, G. and Unruh, J., Jr.: Cholesterol oxides I. Isolation and determination of some cholesterol oxidation products. *J. Am. Oil Chem. Soc.*, 63 (1986) 767-771.

4636 Sripada, P.K.: A simple method for the synthesis of cholesteryl ethers. *J. Lipid Res.*, 27 (1986) 352-353.

13d. Bile acids and alcohols

4637 Iida, T., Momose, T., Chang, F.C. and Nambara, T.: Potential bile acid metabolites. XI. Syntheses of stereoisomeric 7,12-dihydroxy-5α-cholanic acids. *Chem. Pharm. Bull.*, 34 (1986) 1934-1938.

4638 Iida, T., Momose, T., Nambara, T. and Chang, F.C.: Potential bile acid metabolites. X. Syntheses of stereoisomeric 3,7-dihydroxy-5α-cholanic acids. *Chem. Pharm. Bull.*, 34 (1986) 1929-1933.

4639 Kase, B.F., Prydz, K., Björkhem, I. and Pedersen, J.I.: Conjugation of cholic acid with taurine and glycine by rat liver peroxisomes. *Biochem. Biophys. Res. Commun.*, 138 (1986) 167-173.

4640 Kase, B.F., Prydz, K., Björkhem, I. and Pedersen, J.I.: *In vitro* formation of bile acids from di- and trihydroxy-5ß-cholestanoic acid in human liver peroxisomes. *Biochim. Biophys. Acta*, 877 (1986) 37-42.

For additional information see:
C.A., 104 (1986) 182841w.

13e. Ecdysones and other insect steroid hormones

See 4601.

13f. Other steroids

For additional information see:
C.A., 104 (1986) 186726k.

14. STEROID GLYCOSIDES AND SAPONINS

4641 Kwong, E. and McErlane, K.M.: Analysis of digoxin at therapeutic concentrations using high-performance liquid chromatography with post-column derivatization. *J. Chromatogr.*, 381 (1986) 357-363.
4642 Wagner, H. and Reger, H.: Radix Primulae-Extrakte. HPLC-Analyse. *Dtsch. Apoth.-Ztg.*, 126 (1986) 1489-1493.
4643 Watson, D., Taylor, G.W. and Murray, S.: Steroid glucuronide conjugates: analysis by thermospray liquid chromatography negative ion mass spectrometry. *Biomed. Environ. Mass Spectrom.*, 13 (1986) 65-69; *C.A.*, 104 (1986) 200334q.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

15a. Terpenes

See 4644.

15b. Essential oils

4644 Morin, P., Caude, M., Richard, H. and Rosset, R.: Semipreparative separation of terpenoids from essential oils by high-performance liquid chromatography and their subsequent identification by gas chromatography-mass spectrometry. *J. Chromatogr.*, 363 (1986) 57-69.

16. NITRO AND NITROSO COMPOUNDS

4645 Buszewski, B. and Luston, J.: Determination of the stable nitroxyl radical esters of homologous series of fatty acids by ion-pair RP HPLC. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 358-360.
4646 Den, T.G., Ho, K.C., Lee, C.H. and Chang, T.C.: "Donor-acceptor" complex chromatographic separation of explosives on 3-[9'-(10'-methylanthryl)]propylsilane stationary phase by HPLC. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 409-410.
4647 Tejada, S.B., Zweidinger, R.B. and Sigsby, J.E., Jr.: Fluorescnece detection and identification of nitro derivatives of polynuclear aromatic hydrocarbons by on-column catalytic reduction to aromatic amines. *Anal. Chem.*, 58 (1986) 1827-1834.

See also 5040.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

17a. Amines and polyamines

4648 Abe, K. and Hori, T.: Determination of polyamines in human urine by HPLC with fluorescence detection. *Rinsho Kagaku*, 14 (1985) 315-320; *C.A.*, 105 (1986) 19945v.
4649 Cohen, R.A.: Contractions of isolated canine coronary arteries resistant to S_2-serotonergic blockade. *J. Pharmacol. Exp. Ther.*, 237 (1986) 548-552.
4650 Gallo, A.A. and Walters, F.H.: Indirect fluorescent visualization of aliphatic amines. *Anal. Lett.*, 19 (1986) 979-985.

4651 Hougaard, D.M., Nielsen, J.H. and Larsson, L.-I.: Localization and biosynthesis of polyamines in insulin-producing cells. *Biochem. J.*, 238 (1986) 43-47.

See also 4656, 4661.

17b. Catecholamines and their metabolites

4652 Cavanaugh, S.T., Hughes, J.D., Jr. and Hoeldtke, R.D.: Measurement of plasma vanillylmandelic acid by liquid chromatography with electrochemical detection. *J. Chromatogr.*, 381 (1986) 13-19.

4653 Dutrieu, J. and Delmotte, Y.A.: Fast and acurate determination of 3-methoxy-4-hydroxymandelic acid in urine. *Fresenius' Z. Anal. Chem.*, 324 (1986) 322-323.

4654 Honegger, C.G., Krenger, W., Langemann, H. and Kempf, A.: Automated high-performance liquid chromatographic method with column switching for the determination of neurotransmitters and related compounds, ascorbic acid and uric acid in tissue extracts. *J. Chromatogr.*, 381 (1986) 249-258.

4655 Lindgren, K. and Rodopoulos, N.: Determination of vanillylmandelic acid with ion-pair chromatography and fluorescnece detection. *Clin. Chem. (Winston-Salem)*, 32 (1986) 693-696.

4656 Swann, P.G. and Elchisak, M.A.: Sample preparation procedure for determination of dopamine sulfate isomers in human urine by high-performance liquid chromatography with dual-electrode electrochemical detection. *J. Chromatogr.*, 381 (1986) 241-248.

For additional infromation see:
C.A., 104 (1986) 200339v;
105 (1986) 18654n.

See also 5123.

17c. Amine derivatives and amides (excluding peptides)

4657 Andrikopoulos, N.K., Demopoulos, C.A. and Siafaka-Kapadai, A.: High-performance liquid chromatographic analysis of platelet activating factor on a cation-exchange column by direct ultraviolet detection. *J. Chromatogr.*, 363 (1986) 412-417.

4658 Freixa, R., Casas, J., Messeguer, A., Rosello, J. and Gelpi, E.: By product identification in the carbodidimide-assisted synthesis of fatty acid anilides related to Spanish Toxic Oil Syndrome. *J. Agric. Food Chem.*, 34 (1986) 738-742.

4659 Liberato, D.J., Yergey, A.L. and Weintraub, S.T.: Separation and quantification of choline and acetylcholine by thermospray liquid chromatography/mass spectrometry. *Biomed. Environ. Mass Spectrom.*, 13 (1986) 171-174; *C.A.*, 104 (1986) 219259r.

4660 Matsui, F., Sears, R.W. and Lovering, E.G.: Liquid chromatographic determination of hydrazine in polyvinylpyrrolidone. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 521-523.

4661 Suzuki, Y. and Inoue, T.: (High performance liquid chromatographic determination of aliphatic nitriles with fluorescence detection). *Bunseki Kagaku*, 35 (1986) 614-617.

See also 4664, 4784.

18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

18a. Amino acids and their derivatives

4662 Bruton, C.: Fully automated amino acid analysis using pre-column derivatization. *Int. Lab.*, 16, No. 5 (1986) 30-38.

4663 Cohen, S.A., Bidlingmeyer, B.A. and Tarvin, T.L.: PITC derivatives in amino acid analysis. *Nature*, 320 (1986) 769-770; *C.A.*, 105 (1986) 21096n.

4664 De Deyn, P., Marescau, B., Lornoy, W., Becaus, I. and Lowenthal, A.: Guanidino compounds in uraemic dialysed patients. *Clin. Chim. Acta*, 157 (1986) 143-150.

4665 *Einarsson, S., Folestad, S., Josefsson, B.* and *Lagerkvist, S.*: High-resolution reversed-phase liquid chromatography system for the analysis of complex solutions of primary and secondary amino acids. *Anal. Chem.*, 58 (1986) 1638-1643.
4666 Finke, J. and Hägele, E.O.: Determination of thyroxine (T4) in serum with HPLC. *Fresenius' Z. Anal. Chem.*, 324 (1986) 318-319.
4667 Gerlach, M., Klaunzer, N. and Przuntek, H.: Determination of L-DOPA and 3-O-methyl DOPA in human plasma by extraction using C_{18} cartridges followed by high-performance liquid chromatographic analysis with electrochemical detection. *J. Chromatogr.*, 380 (1986) 379-385.
4668 Griffith, O.W., Campbell, E.B., Pirkle, W.H., Tsipouras, A. and Hyun, M.H.: Liquid chromatographic separation of enantiomers of ß-amino acids using a chiral stationary phase. *J. Chromatogr.*, 362 (1986) 345-352.
4669 Harduf, Z.: Detection wavelength and integration strategy for amino acid analysis. *J. Chromatogr.*, 363 (1986) 261-266.
4670 Harduf, Z.: Rapid determination of arginine by high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 428-430.
4671 Hatanaka, H. and Kaneda, Y.: (Rapid and simultaneous analysis of hippuric and benzoic acids in fermented milk or raw milk by HPLC). *Shokuhin Eiseigaku Zasshi*, 27 (1986) 81-86; *C.A.*, 105 (1986) 23154d.
4672 Hoffman, J.L.: Chromatographic analysis of the chiral and covalent instability of S-adenosyl-L-methionine. *Biochemistry*, 261 (1986) 4444-4449.
4673 Kagedal, B., Carlsson, M. and Denneberg, T.: Determination of 2-mercaptopropionylglycine in plasma and urine by high-peroformance liquid chromatography. *J. Chromatogr.*, 380 (1986) 301-311.
4674 Marquez, F.J., Quesada, A.R., Sanchez-Jimenez, F. and Nunez de Castro, I.: Determination of 27 dansyl amino acid derivatives in biological fluids by reversed-phase high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 275-283.
4675 Metrione, R.M.: Separation of Lissamine rhodamine B sulfonyl derivative of amino acids by high-performance liquid chromatography and thin-layer chromatography. *J. Chromatogr.*, 363 (1986) 337-344.
4676 Minkler, P.E., Erdos, E.A., Ingalls, S.T., Griffin, R.L. and Hoppel, C.L.: Improved high-performance liquid chromatographic method for the determination of 6-N,N,N-trimethyllysine in plasma and urine: biomedical application of chromatographic figures of merit and amine mobile phase modifiers. *J. Chromatogr.*, 380 (1986) 285-299.
4677 Reitsma, B.H. and Yeung, E.S.: High-performance liquid chromatographic determination of enantiomeric ratios of amino acids without chiral separation. *J. Chromatogr.*, 362 (1986) 353-362.
4678 Uchida, K. and Kawakishi, S.: Selective oxidation of imidazole ring in histidine residues by the ascorbic acid - copper ion system. *Biochem. Biophys. Res. Commun.*, 138 (1986) 659-665.
4679 Unger, S.E. and Warrack, B.M.: Pharmaceutical analysis using thermospray liquid chromatography/mass spectrometry and mass spectrometry/mass spectrometry. *Spectroscopy*, 1 (1986) 33-38; *C.A.*, 105 (1986) 3032j.
4680 Webb, L.E.: Determination of creatine in serum by ion-pair high-performance liquid chromatography with fluorometric detection. *J. Chromatogr.*, 381 (1986) 406-410.
4681 Wiedemann, E., Hägele, E., Siedel, J. and Ziegenhorn, J.: Determination of creatine in serum with HPLC and column switching. *Fresenius' Z. Anal. Chem.*, 324 (1986) 334-335.

For additional information see:
C.A., 104 (1986) 221530r, 221629e;
105 (1986) 6814b, 17559y.

See also 4651, 4704, 4762, 4792, 5017.

18b. Peptides and peptidic and proteinous hormones

4682 Abiko, T., Shishido, H. and Sekino, H.: Synthesis of the nonatetracontapeptide corresponding to the entire amino acid sequence of thymopoietin III and its effect on the impaired T-lymphocyte transformation of a patient with common variable immunodeficiency. *Chem. Pharm. Bull.*, 34 (1986) 2133-2143.

4683 Akai, K., Goto, M. and Ueda, M.: Isolation of epidermal growth factor with monoclonal antibody. *Chem. Pharm. Bull.*, 34 (1986) 1721-1727.

4684 Brewer, S.J., Dickerson, C.H., Ewbank, J. and Fallon, A.: Large scale high-performance liquid chromatography of urogastrone produced by recombinant DNA technology. *J. Chromatogr.*, 362 (1986) 443-449.

4685 Chan, J.S.D., Nie, Z.R., Seidah, N.G. and Chretien, M.: Purification of ovine placental lactogen (oPL) using HPLC. Evidence for two forms of oPL. *FEBS Lett.*, 199 (1986) 259-264; *C.A.*, 105 (1986) 760j.

4686 Changaris, D.G., Miller, J.J. and Levy, R.S.: Angiotensin II generated by a human renal carboxypeptidase. *Biochem. Biophys. Res. Commun.*, 138 (1986) 573-579.

4687 Demmer, W. and Brand, K.: A putative opioid-peptide processing activity in enriched Golgi fraction from rat brain. *Biochem. Biophys. Res. Commun.*, 138 (1986) 356-362.

4688 Djura, P. and Hoskinson, R.M.: Radioiodination of somatostatin analogues employing Sep-Pak rapid sample purification and label assessment by high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 424-427.

4689 Dunn, B.M., Jimenez, M., Parten, B.F., Valler, M.J., Rolph, C.E. and Kay, J.: A systematic series of synthetic chromophoric substrates for aspartic proteinases. *Biochem. J.*, 237 (1986) 899-906.

4690 Fisher, B.V. and Smith, D.: HPLC as a replacement for the animal response assays for insulin. *J. Pharm. Biomed. Anal.*, 4 (1986) 377-387.

4691 Gibson, B.W., Poulter, L., Williams, D.H. and Maggio, J.E.: Novel peptide fragments originating from PGL^a and the caerulein and xenopsin precursors from *Xenopus laevis*. *J. Biol. Chem.*, 261 (1986) 5341-5349.

4692 Knight, M.: Countercurrent chromatography of peptides on the Ito coil planet centrifuges. *LC Mag.*, 3 (1985) 1062-1064; *C.A.*, 105 (1986) 6796x.

4693 Kojima, K. and Nagatsu, T.: HPLC for enkephalins and enkephalin-containing peptides. *Prog. HPLC*, 1 (Gel Permeation Ion-Exch. Chromatogr. Proteins Pept.) (1985) 157-177; *C.A.*, 105 (1986) 18531v.

4694 Liberti, J.P. and Joshi, G.S.: Synthesis and secretion of phosphorylated growth hormone by rat pituitary glands *in vitro*. *Biochem. Biophys. Res. Commun.*, 137 (1986) 806-812.

4695 Manning, D.C., Vavrek, R., Stewart, J.M. and Snyder, S.H.: Two bradykinin binding sites with picomolar affinities. *J. Pharmacol. Exp. Ther.*, 237 (1986) 504-512.

4696 Mychack, P. and Benson, J.R.: Peptide separations using high performance ion-exchange chromatography. *LC-GC*, 4 (1986) 462-468; *C.A.*, 105 (1986) 2960y.

4697 Ohno, N., Mimura, H., Suzuki, I. and Yadomae, T.: Chemical characterization of a fungal B-cell mitogen obtained from the fruit body of *Peziza vesiculosa*. *Chem. Pharm. Bull.*, 34 (1986) 2112-2117.

4698 Rehfeld, J.F. and Hansen, H.F.: Characterization of preprocholecystokinin products in the porcine cerebral cortex. Evidence of different processing pathways. *J. Biol. Chem.*, 261 (1986) 5832-5840.

4699 Rehfeld, J.F.: Accumulation of nonamidated preprogastrin and preprocholecystokinin products in porcine pituitary corticotrophs. Evidence of posttranslational control of cell differentiation. *J. Biol. Chem.*, 261 (1986) 5841-5847.

4700 Schole, J., Sallmann, H.-P. and Sonnenschein, B.: Untersuchungen über das Vorkommen eines anabol wirksamen Prinzips in einem Extrakt aus *E. coli*. *Arzneim.-Forsch.*, 36 (1986) 1216-1220.

4701 Shimokura, M., Kiso, Y., Nagata, A., Tsuda, M., Seki, H., Kai, Y., Fujii, N. and Yajima, H.: Studies on peptides. CXXXVIII. Conventional solution synthesis of bovine hypothalamic growth hormone releasing factor (bGRF). *Chem. Pharm. Bull.*, 34 (1986) 2218-2223.

4702 Snajdar, R.M. and Rapp, J.P.: Elevated atrial natriuretic polypeptide in plasma of hypertensive Dahl salt-sensitive rats. *Biochem. Biophys. Res. Commun.*, 137 (1986) 876-883.

4703 Someno, T. and Ishii, S.-I.: A simple method for semi-synthesis of peptidyl argininals as potent inhibitors of trypsin-like proteases. *Chem. Pharm. Bull.*, 34 (1986) 1748-1754.

4704 Stein, A.F., Dills, R.L. and Klaassen, C.D.: High-performance liquid chromatographic analysis of glutathione and its thiol and disulfide degradation products. *J. Chromatogr.*, 381 (1986) 259-270.

4705 Swaisgood, H.E. and Chaiken, I.M.: Analytical high-performance affinity chromatography: evaluation by studies of neurophysin self-association and neurophysin-peptide hormone interaction using glass matrices. *Biochemistry*, 25 (1986) 4148-4155.

4706 Yamada, T., Kurokawa, S., Dejima, K., Watanabe, K., Kotani, M., Miyazawa, T. and Kuwata, S.: Studies of separation of peptide diastereomers by reversed-phase HPLC and its applications. I. Synthesis and separation of various, diastereomeric N-benzylocarbonyl tripeptide methyl esters. *Mem. Konan Univ., Sci. Ser.*, 32 (1986) 11-26; *C.A.*, 105 (1986) 6792t.

For additional information see:
C.A., 104 (1986) 200345u, 222976c.

See also 4757, 4768, 4821, 4859.

18c. General techniques of elucidation of structure of proteins

4707 Aumer, H., Henschen, A. and Lee, C.-H.: Isolation and amino-acid sequence analysis of human sperm protamines P1 and P2. Occurrence of two forms of protamine P2. *Biol. Chem. Hoppe-Seyler*, 367 (1986) 515-522.

4708 Chen, S., Shively, J.E., Nakajin, S., Shinoda, M. and Hall, P.F.: Amino terminal sequence analysis of human placenta aromatase. *Biochem. Biophys. Res. Commun.*, 135 (1986) 713-719.

4709 Chiou, S.-H., Chang, T., Chang, W.-C., Kuo, J. and Lo, T.-B.: Characterization of lens crystallins and their mRNA from the carp lenses. *Biochim. Biophys. Acta*, 871 (1986) 324-328.

4710 Edwards, L.A. and Huber, R.E.: A detailed examination of the iodination of β-galactosidase: stoichiometric inactivation by nonspecific iodination. *Biochem. Cell Biol.*, 64 (1986) 523-527.

4711 Grego, B., van Driel, I.R., Goding, J.W., Nice, E.C. and Simpson, R.J.: Use of microbore HPLC for purifying subnanomole levels of polypeptides for microsequencing. Structural studies on the murine plasma cell antigen PC-1. *Int. J. Pept. Protein Res.*, 27 (1986) 201-207; *C.A.*, 104 (1986) 184471z.

4712 Ishijima, S., Izui, K. and Katsuki, H.: Phosphoenolpyruvate carboxylase of *Escherichia coli* K-12. N- and C-terminal sequences and tentative assignment of the catalytically essential cysteine residue. *J. Biochem. (Tokyo)*, 99 (1986) 1299-1310.

4713 Kawasaki, H., Kurosu, J., Kasai, H., Isobe, T. and Okuyama, T.: Limited digestion of calmodulin with trypsin in the presence or absence of various metal ions. *J. Biochem. (Tokyo)*, 99 (1986) 1409-1416.

4714 Kitagawa, I., Tsunasawa, S., Tanaka, N., Katsube, J., Sakiyama, F. and Asada, K.: Amino acid sequence of copper, zinc-superoxide dismutase from spinach leaves. *J. Biochem. (Tokyo)*, 99 (1986) 1289-1298.

4715 Kuehl, L., Childers, T.J. and McCauley, R.M.: The occurrence of extended acidic sequences in nonhistone chromosomal proteins. *Arch. Biochem. Biophys.*, 248 (1986) 272-281.

4716 Kuroki, R., Yamada, H. and Imoto, T.: Specific carbodiimide-binding mechanism for the selective modification of the aspartic acid-101 residue of lysozyme in the carbodiimide-amine reaction. *J. Biochem. (Tokyo)*, 99 (1986) 1493-1499.

4717 Legrand, D., Mazurier, J., Aubert, J.-P., Loucheux-Lefebvre, M.-H., Montreuil, J. and Spik, G.: Evidence for interactions between the 30 kDa N- and 50 kDa C-terminal tryptic fragments of human lactotransferrin. *Biochem. J.*, 236 (1986) 839-844.

4718 Peterson, D.L., Shires, T.K. and Krieter, P.A.: Assessment of internal primary structure of polypeptides newly translated *in vitro* by reticulocyte lysate: a study with cytochrome b_5. *J. Appl. Biochem.*, 7 (1985) 396-407; *C.A.*, 104 (1986) 182804m.

4719 Sasaki, T., Morita, T. and Iwanaga, S.: Identification of the plasminogen-binding site of human α_2-plasmin inhibitor. *J. Biochem. (Tokyo)*, 99 (1986) 1699-1705.

4720 Walker, J.E., Fearnley, I.M. and Blows, R.A.: A rapid solid-phase protein microsequencer. *Biochem. J.*, 237 (1986) 73-84.

19. PROTEINS

19a. General techniques

4721 Irvine, G.B. and Shaw, C.: A volatile solvent for high-performance gel-permeation chromatography of polypeptides. *Biochem. Soc. Trans.*, 14 (1986) 445-446; *C.A.*, 104 (1986) 203314u.

4722 Josic, D.: (Anion-exchange HPLC of proteins). *LaborPraxis*, 10 (1986) 202-212; *C.A.*, 104 (1986) 203287n.

4723 Jun, S.-H. and Ruckenstein, E.: Separation of a multicomponent mixture of proteins by potential barrier chromatography (PBC). *Separ. Sci.*, 21 (1986) 111-138.

4724 Takagi, T.: Determination of protein molecular weight by gel permeation chromatography equipped with low-angle laser light scattering photometer. *Prog. HPLC*, 1 (Gel Permeation Ion-Exch. Chromatogr. Proteins Pept.) (1985) 27-41; *C.A.*, 104 (1986) 203213k.

For additional information see:
C.A., 105 (1986) 21158j.

19b. Proteins of cells, viruses and subcellular particles (excluding blood cells and platelets)

4725 Threadgill, G.J., Conrad, R.C., Changchien, L.-M., Cannon, M. and Craven, G.R.: Application of high-performance liquid chromatography to the purification and characterization of ribosomal protein L3 from trichodermin-resistant yeast mutants. *Biochem. J.*, 237 (1986) 421-426.

For additional information see:
C.A., 104 (1986) 230432n;
105 (1986) 21180k.

19c. Microbial and plant proteins

4726 Davis, S.J. and Wheldrake, J.F.: Sulphation and the vegetative growth of *Dictyostelium discoideum*. *Eur. J. Biochem.*, 158 (1986) 179-185.

4727 Ejiri, S.: Purification and characterization of polypeptide chain elongation factor 1 from plants. *Methods Enzymol.*, 118 (Plant Mol. Biol.) (1986) 140-153; *C.A.*, 105 (1986) 2943v.

4728 Faye, L., Sturm, A., Bollini, R., Vitale, A. and Chrispeels, M.J.: The position of the oligosaccharide side-chains of phytohemagglutinin and their accessibility to glycosidases determines their subsequent processing in the Golgi. *Eur. J. Biochem.*, 158 (1986) 655-661.

4729 Fish, L.E. and Bogorad, L.: Identification and analysis of the maize P700 chlorophyll a apoproteins PSI-A1 and PSI-A2 by high pressure liquid chromatography analysis and partial sequence determination. *J. Biol. Chem.*, 261 (1986) 8134-8139.

4730 Fulton, R.J., Blakey, D.C., Knowlew, P.P., Uhr, J.W., Thorpe, P.E. and Vitetta, E.S.: Purification of ricin A_1, A_2 and B chains and characterization of their toxicity. *J. Biol. Chem.*, 261 (1986) 5314-5319.

4731 Lax, S.R., Lauer, S.J., Browning, K.S. and Ravel, J.M.: Purification and properties of protein synthesis initiation and elongation factors from wheat germ. *Methods Enzymol.*, 118 (Plant Mol. Biol.) (1986) 109-128; *C.A.*, 105 (1986) 2942u.

4732 Lei, M.-G. and Reeck, G.R.: Combined use of trypsin-agarose affinity chromatography and reversed-phase high-performance liquid chromatography for the purification of single-chain protease inhibitor from corn seeds. *J. Chromatogr.*, 363 (1986) 315-321.

4733 Odintsova, T.I., Egorov, T.A. and Sozinov, A.A.: Isolation of wheat ω-gliadins, using chromatography on thiopropyl-Sepharose. *Biokhimiya (Moscow)*, 51 (1986) 1124-1131.

4734 Salomonsson, L. and Larson-Raznikiewicz, M.: Methods for fractionation and characterization of proteins in wheat. *Swed. J. Agric. Res.*, 15 (1985) 123-131; *C.A.*, 105 (1986) 3046s.

4735 Sessa, D.J. and Bietz, J.A.: Toasted soybean flour components with trypsin inhibitor activity. *J. Am. Oil Chem. Soc.*, 63 (1986) 784-788.

For additional information see:
C.A., 105 (1986) 2965d, 20789d.

See also 4725, 4768.

19d. Proteins of blood, serum and blood cells

4736 Beals, J.M. and Castellino, F.J.: The interaction of bovine factor IX, its activation intermediate, factor IXα, and its activation products, factor IXaα and factor IXaβ, with acidic phospholipid vesicles of various compositions. *Biochem. J.*, 236 (1986) 861-869.

4737 Chandrasekharappa, S.C. and Jacob, T.M.: Purification of antibodies specific to a dinucleotide using the hapten bound to DEAE cellulose as an affinity column. *Immunol. Invest.*, 15 (1986) 1-9; *C.A.*, 104 (1986) 223010v.

4738 Fay, P.J., Anderson, M.T., Chavin, S.I. and Marder, V.J.: The size of human factor VIII heterodimers and the effects produced by thrombin. *Biochim. Biophys. Acta*, 871 (1986) 268-278.

4739 Fischer, A.M., Yu, X.J., Tapon-Bretaudiere, J., Muller, D., Bros, A. and Jozefonvicz, J.: Thrombin purification by one-step preparative affinity chromatography on modified polystyrenes. *J. Chromatogr.*, 363 (1986) 95-100.

4740 Friesen, A.D.: Purified immunoglobulin. *Can. Pat.* CA 1,201,063 (Cl. A61K39/395), 25 Feb. 1986, Appl. 407,649, 20 Jul. 1982; 19 pp.; *C.A.*, 105 (1986) 12079g.

4741 Goren, T., Fischer, D.G. and Rubinstein, M.: Priming of leukocytes selectively increases the level of some interferon-α subtypes and not others. *Biochim. Biophys. Acta*, 887 (1986) 80-85.

4742 Kobayashi, N., Suzuki, M., Nakagawa, T. and Matumoto, M.: Separation of hemagglutination-inhibiting immunoglobulin M antibody to rubella virus in human serum by HPLC. *J. Clin. Microbiol.*, 23 (1986) 1143-1145; *C.A.*, 105 (1986) 22636a.

4743 Mian, N.: Analysis of cell-growth-phase-related variations in hyaluronate synthase activity of isolated plasma-membrane fractions of cultured human skin fibroblasts. *Biochem. J.*, 237 (1986) 333-342.

4744 Miam, N.: Characterization of a high-M_r plasma-membrane-bound protein and assessment of its role as a constituent of hyaluronate synthase complex. *Biochem. J.*, 237 (1986) 343-357.

4745 Miyata, K., Yamamoto, Y., Ueda, M., Kawade, Y., Matsumoto, K. and Kubota, I.: Purification of natural human interferon-gamma by antibody affinity chromatography: analysis of constituent protein species in the dimers. *J. Biochem. (Tokyo)*, 99 (1986) 1681-1688.

4746 Ohkubo, I., Sahashi, W., Namikawa, C., Tsukada, K., Takeuchi, T. and Sasaki, M.: A procedure for large scale purification of human plasma amyloid P component. *Clin. Chim. Acta*, 157 (1986) 95-102.

4747 Sampietro, T., Lenzi, S., Cecchetti, P., Giampietro, O., Cruschelli, L. and Navalesi, R.: Nonenzymatic glycation of human platelet membrane proteins *in vitro* and *in vivo*. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1328-1331.

4748 Schwartz, W.E., Clark, F.M. and Sabran, I.B.: Process-scale isolation and purification of immunoglobulin G. *LC-GC*, 4 (1986) 442-448; *C.A.*, 104 (1986) 230300t.

4749 Stampe, D., Wieland, B. and Köhle, A.: Isolation of factor IX concentrates for clinical use by ion-exchange chromatography and ammonium sulphate precipitation. *J. Chromatogr.*, 363 (1986) 101-103.

4750 Sudo, K., Maekawa, M., Watanabe, H., Matsumoto, K., Mori, Y., Sasaki, T. and Kanno, T.: A case of immunoglobulin G conjugated with lactate dehydrogenase, producing both loss of enzyme activity and an abnormal isoenzyme pattern. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1420-1422.

4751 Walker, S.W., Howie, A.F. and Smith, A.F.: The measurement of glycosylated albumin by reduction of alkaline nitro-blue tetrazolium. *Clin. Chim. Acta*, 156 (1986) 197-206.

For additional information see:
C.A., 104 (1986) 182455y, 182902s, 205033a, 205036d, 205046g, 223006y; 105 (1986) 19954x, 21301a.

See also 4559, 4776, 4788.

19e. Structural and muscle proteins

4752 Balduyck, M., Mizon, C., Loutfi, H., Richet, C., Roussel, P. and Mizon, J.: The major human urinary trypsin inhibitor is a proteoglycan. *Eur. J. Biochem.*, 158 (1986) 417-422.

4753 Barylko, B., Tooth, P. and Kendrick-Jones, J.: Proteolytic fragmentation of brain myosin and localisation of the heavy-chain phosphorylation sites. *Eur. J. Biochem.*, 158 (1986) 271-282.

4754 Bruch, M. and Bieth, J.G.: Influence of elastin on the inhibition of leucocyte elastase by α_1-proteinase inhibitor and bronchial inhibitor. Potent inhibition of elastin-bound elastase by bronchial inhibitor. *Biochem. J.*, 238 (1986) 269-273.

4755 Campbell, I.K., Roughley, P.J. and Mort, J.S.: The action of human articular-cartilage metalloproteinase on proteoglycan and link protein. Similarities between products of degradation *in situ* and *in vitro*. *Biochem. J.*, 237 (1986) 117-122.

4756 Dowling, L.M., Crewther, W.G. and Inglis, A.S.: The primary structure of component 8c-1, a subunit protein of intermediate filaments in wool keratin. Relationships with proteins from other intermediate filaments. *Biochem. J.*, 236 (1986) 695-703.

4757 Hojrup, P., Andersen, S.O. and Roepstorff, P.: Primary structure of a structural protein from the cuticle of the migratory locust, *Locusta migratoria*. *Biochem. J.*, 236 (1986) 713-720.

4758 Huber, S., van der Rest, M., Bruckner, P., Rodriguez, E., Winterhalter, K.H. and Vaughan, L.: Identification of the type IX collagen polypeptide chains. The 2(IX) polypeptide carries the chondroitin sulfate chain(s). *J. Biol. Chem.*, 261 (1986) 5965-5968.

4759 Said, H.M., Nesom, A.E., Feige, A.J., Lauren, S.L. and Mathews, R.A.: Cystine-rich proteins of human hair: characterization and structure as revealed by reversed-phase and size-exclusion high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 41-52.

4760 Svärd, M., Drakenberg, T., Andersson, T. and Fernlund, P.: Calcium binding to bone γ-carboxyglutamic acid aprotein from calf studied by ^{43}Ca NMR. *Biochem. J.*, 158 (1986) 373-378.

19f. Protamines, histones and other nuclear proteins

4761 Gaczynski, M.: A note on the use of protease inhibitors during chromatin fractionation on hydroxyapatite columns. *Experientia*, 42 (1986) 402-403; *C.A.*, 105 (1986) 21175n.

4762 McKay, D.J., Renaux, B.S. and Dixon, G.H.: Rainbow trout protamines. Amino acid sequences of six distinct proteins from a single testis. *Eur. J. Biochem.*, 158 (1986) 361-366.

19g. Chromoproteins and metalloproteins

4763 Collawn, J.R., Jr., Donato, H., Jr. and Fish, W.W.: Evidence that H-enriched human placental ferritin is structurally similar to L-enriched ferritins of other tissues. *Biochim. Biophys. Acta*, 871 (1986) 235-242.

4764 Hayashi, S., Noshiro, M. and Okuda, K.: Isolation of a cytochrome P-450 that catalyzes the 25-hydroxylation of vitamin D_3 from rat liver microsomes. *J. Biochem. (Tokyo)*, 99 (1986) 1753-1763.

4765 Hsia, C.J.C., Hronowski, L.J., Persaud, K. and Ansari, M.R.: ATP-hemoglobin purification by ATP-agarose affinity chromatography. *J. Chromatogr.*, 381 (1986) 153-157.

4766 San George, R.C. and Hoberman, H.D.: Reaction of acetaldehyde with hemoglobin. *J. Biol. Chem.*, 261 (1986) 6811-6821.
4767 Schroeder, W.A., Shelton, J.B., Shelton, J.R. and Huyna, V.: The estimation of Hb A_2 in the presence of Hb C or Hb E by reversed-phase HPLC. *Hemoglobin*, 10 (1986) 253-257; *C.A.*, 105 (1986) 2961z.
4768 Simpson, R.J., Mortiz, R.L., Nice, E.C., Grego, B., Yoshizaki, F., Sugimura, Y., Freeman, H.C. and Murata, M.: Complete amino acid sequence of plastocyanin from a green alga, *Enteromorpha prolifera*. *Eur. J. Biochem.*, 157 (1986) 497-506.
4769 Tam, L., Gray, G.P. and Riggs, A.F.: The hemoglobins of the bullfrog *Rana catesbeiana*. The structure of the β chain of component C and the role of the α chain in the formation of intermolecular disulfide bonds. *J. Biol. Chem.*, 261 (1986) 8290-8294.
4770 Voglsang, E. and Schüttler, A.: Separation of clinically important haemoglobins by fast protein liquid chromatography (FPLC). *Fresenius' Z. Anal. Chem.*, 324 (1986) 336.
4771 Wajcman, H. and Baudin, V.: Application of reversed-phase high-performance liquid chromatography for structural characterization of abnormal hemoglobins. *TrAC*, 5 (1986) 151-154.

For additional information see:
C.A., 104 (1986) 182650h;
105 (1986) 3076b.

See also 4776, 4790.

19h. Proteins of glands, gland products and various zymogens (including milk proteins)

4772 Bezwoda, W.R. and Mansoor, N.: Isolation and characterization of lactoferrin separated from human whey by adsorption chromatography using Cibacron Blue F3G-A linked affinity adsorbent. *Clin. Chim. Acta*, 157 (1986) 89-94.
4773 Chaplin, L.C.: Hydrophobic interaction fast protein liquid chromatography of milk proteins. *J. Chromatogr.*, 363 (1986) 329-335.
4774 Freyssinet, J.-M., Gauchy, J. and Cazenave, J.-P.: The effect of phospholipids on the activation of protein C by the human thrombin-thrombomodulin complex. *Biochem. J.*, 238 (1986) 151-157.

See also 4792, 4812.

19i. Proteins of neoplastic tissue

For additional information see:
C.A., 104 (1986) 223448u.

See also 4882.

19j. Specific binding proteins

4775 Borsi, L., Castellani, P., Balza, E., Siri, A., Pellecchia, C., De Salzi, F. and Zardi, L.: Large-scale procedure for the purification of fibronectin domains. *Anal. Biochem.*, 155 (1986) 335-345.
4776 Brunauer, L.S. and Clarke, S.: Methylation of calmodulin at carboxylic acid residues in erythrocytes. A non-regulatory covalent modification? *Biochem. J.*, 236 (1986) 811-820.
4777 Collins, S. and Marletta, M.A.: Purification of a benzo[*a*]pyrene binding protein by affinity chromatography and photoaffinity labeling. *Biochemistry*, 25 (1986) 4322-4329.
4778 Evans, T., Brown, M.L., Fraser, E.D. and Northup, J.K.: Purification of the major GTP-binding proteins from human placental membranes. *J. Biol. Chem.*, 261 (1986) 7052-7059.
4779 Harding, M.W., Handschumacher, R.E. and Speicher, D.W.: Isolation and amino acid sequence of cyclophilin. *J. Biol. Chem.*, 261 (1986) 8547-8555.
4780 Ito, A., Sakyo, K., Sano, H., Hirakawa, S. and Mori, Y.: Cytoplasmic dehydroepiandrosterone sulfate-binding protein in rabbit uterine cervix. *Chem. Pharm. Bull.*, 34 (1986) 2118-2125.

4781 Jarrett, H.W.: High-pressure affinity chromatography of calmodulin on a phenothiazine-silica. *J. Chromatogr.*, 363 (1986) 456-461.

4782 Katada, T., Oinuma, M. and Ui, M.: Two guanine nucleotide-binding proteins in rat brain serving as the specific substrate of islet-activating protein, pertussis toxin. Interaction of the α-subunits with βγ-subunits in development of their biological activities. *J. Biol. Chem.*, 261 (1986) 8182-8191.

4783 Krozowski, Z.S. and Funder, J.W.: Purification of renal mineralocorticoid receptors using affinity chromatography. *Serono Symp. Publ. Raven Press*, 27 (Adrenal Gland Hypertens) (1985) 241-253; *C.A.*, 105 (1986) 2887e.

4784 Kumano, T., Yoshioka, T. and Uematsu, T.: Comparative effect of chemical structure of chlorinated N-hydroxy-N-acyl-aminobiphenyl ethers and their related compounds on rat liver cytosol-catalyzed transacylation. *Drug Metab. Disp.*, 14 (1986) 487-493.

4785 Lefevbre, Y.A., Venkatraman, J.T., Golsteyn, E.J. and Howell, G.M.: Interaction of steroids with the nuclear envelope. *Biochem. Cell Biol.*, 64 (1986) 594-600.

4786 Lobanenkov, V.V., Nicolas, R.H., Plumb, M.A., Wright, C.A. and Goodwin, G.H.: Sequence-specific DNA-binding proteins which interact with (G+C)-rich sequences flanking the chicken c-myc gene. *Eur. J. Biochem.*, 159 (1986) 181-188.

4787 Maly, P. and Lüthi, C.: Purification of the type I insulin-like growth factor receptor from human placenta. *Biochem. Biophys. Res. Commun.*, 137 (1986) 695-701.

4788 Martin, J.L. and Baxter, R.C.: Insulin-like growth factor-binding protein from human plasma. Purification and characterization. *J. Biol. Chem.*, 261 (1986) 8754-8760.

4789 Miribel, L., Goldschmidt-Clermont, P., Galbraith, R.M. and Arnaud, P.: Rapid purification of native group-specific component (vitamin D-binding protein) by differential affinity for immobilized triazine dyes. *J. Chromatogr.*, 363 (1986) 448-455.

4790 Moore, P.B.: 67 kDA Calcimedin, a new Ca^{2+}-binding protein. *Biochem. J.*, 238 (1986) 49-54.

4791 Morton, R.E.: Specifity of lipid transfer protein for molecular species of cholesteryl ester. *J. Lipid Res.*, 27 (1986) 523-529.

4792 Norrman, B., Pohl, G., Jörnvall, H. and Wallen, P.: Proteolytically induced variations in the enzymatic properties of tissue plasminogen activator. Activations, inactivations and reactivations. *Eur. J. Biochem.*, 159 (1986) 7-13.

4793 Ramwani, J. and Mishra, R.K.: Purification of bovine striatal dopamine D-2 receptor by affinity chromatography. *J. Biol. Chem.*, 261 (1986) 8894-8898.

4794 Rosenthal, W., Koesling, D., Rudolph, U., Kleuss, C., Pallast, M., Yajima, M. and Schultz, G.: Identification and characterization of the 35-kDa β subunit of guanine-nucleotide-binding proteins by an antiserum raised against transducin. *Eur. J. Biochem.*, 158 (1986) 255-263.

4795 Sakai, S., Ike, F., Kohmoto, K. and Johke, T.: Separation of rabbit mammary-gland prolactin receptors by ion-exchange chromatography, HPLC-gel filtration and ultracentrifugation. *Biochem. J.*, 237 (1986) 651-653.

4796 Sakyo, K., Ito, A., Hirakawa, S. and Mori, Y.: Specific binding of dehydro-epiandrosterone sulfate to a cytoplasmic macromolecule in human fetal membrane. *Chem. Pharm. Bull.*, 34 (1986) 2126-2132.

4797 Schröder, H.C., Rottmann, M., Bachmann, M., Müller, W.E.G., McDonald, A.R. and Agutter, P.S.: Proteins from rat liver cytosol which stimulate mRNA transport. Purification and interactions with the nuclear envelope mRNA translocation system. *Eur. J. Biochem.*, 159 (1986) 51-59.

4798 Simon, J. and Leroith, D.: Insulin receptors of chicken liver and brain. Characterization of α and β subunit properties. *Eur. J. Biochem.*, 158 (1986) 125-132.

4799 Takagi, T., Konishi, K. and Cox, J.A.: Amino acid sequence of two sarcoplasmic calcium-binding proteins from the protochordate *Amphioxus*. *Biochemistry*, 25 (1986) 3585-3592.

4800 Takeda, Y., Kim, J.G., Caday, C.G., Steers, E., Jr., Ohlendorf, D.H., Anderson, W.F. and Matthews, B.W.: Different interactions used by Cro repressor in specific and nonspecific DNA binding. *J. Biol. Chem.*, 261 (1986) 8608-8616.

4801 Wang, S.-L., Rice, S.A., Serra, M.T. and Gross, B.: Purification and identification of rat hepatic cytosolic enzymes responsible for defluorination of methoxyflurane and fluoroacetate. *Drug Metab. Disp.*, 14 (1986) 392-398.

4802 Watts, C.K.W. and Sutherland, R.L.: Microsomal binding sites for antioestrogens in rat liver. Properties and detergent solubilization. *Biochem. J.*, 236 (1986) 903-911.

4803 Zhang, Z., Fournier, A. and Tan, Y.H.: The isolation of human ß-interferon receptor by wheat germ lectin affinity and immunosorbent column chromatographies. *J. Biol. Chem.*, 261 (1986) 8017-8021.

For additional information see:
C.A., 104 (1986) 180296y, 203277j;
105 (1986) 2952x, 2968g, 2969h, 18502m, 21157h.

See also 4564, 4804, 4949.

19k. Urinary proteins

See 4442.

19l. Other proteins

4804 Chandler, C.S. and Ballard, F.J.: Multiple biotin-containing proteins in 3T3-L1 cells. *Biochem. J.*, 237 (1986) 123-130.
4805 Farrell, D.H., van Nostrand, W.E. and Cunningham, D.D.: A simple two-step purification of protease nexin. *Biochem. J.*, 237 (1986) 907-912.
4806 Fujii, T., Gocho, N., Akabane, Y., Kondo, Y., Suzuki, T. and Ohki, K.: Effect of calcium ions on the interaction of S-100 protein with microtubule proteins. *Chem. Pharm. Bull.*, 34 (1986) 2261-2264.
4807 Harper, J.W., Strydom, D.J. and Lobb, R.R.: Human class 1 heparin-binding growth factor: structure and homology to bovine acidic brain fibroblast growth factor. *Biochemistry*, 25 (1986) 4097-4103.
4808 Hu, J., Zheng, Y., Zhuang, H. and Yao, Z.: (Purification of anthrax protective antigen by high performance gel filtration chromatography). *Sepu*, 2 (1985) 293-296; *C.A.*, 105 (1986) 4687p.
4809 Martin, J.-L., Rose, K., Hughes, G.J. and Magistretti, P.J.: [mono[^{125}I]iodo-Tyr^{10},MetO^{17}]-vasoactive intestinal polypeptide. Preparation, characterization, and use for radioimmunoassay and receptor binding. *J. Biol. Chem.*, 261 (1986) 5320-5327.
4810 Pratt, C.W. and Pizzo, S.V.: *In vivo* metabolism of inter-α-trypsin inhibitor and its proteinase complexes: evidence for proteinase transfer to α_2-macroglobulin and α_1-proteinase inhibitor. *Arch. Biochem. Biophys.*, 248 (1986) 587-596.
4811 Ueno, N., Baird, A., Esch, F., Ling, N. and Guillemin, R.: Isolation of an amino terminal extended form of basic fibroblast growth factor. *Biochem. Biophys. Res. Commun.*, 138 (1986) 580-588.
4812 Yamamoto, T., Sumi, H., Maruyama, M., Mizumoto, H., Ikeda, R., Yoshihara, H. and Mihara, H.: Acid stable trypsin inhibitor in bile. *Clin. Chim. Acta*, 158 (1986) 91-98.

For additional information see:
C.A., 104 (1986) 219256n;
105 (1986) 21164h.

See also 4752.

20. ENZYMES

4813 Takasawa, S. and Yokoyo, Y.: Chromatographic separation of enzymes-utilization of affinity chromatography). *Kogaku to Kogyo*, 37 (1984) 304-305; *C.A.*, 104 (1986) 202705k - a review with 2 refs.

20a. Oxidoreductases

4814 Batra, S.P. and Colman, R.F.: Isolation and identification of cysteinyl peptide labeled by 6-[(4-bromo-2,3-dioxobutyl)thio]-6-deaminoadenosine 5'-diphosphate in the reduced diphosphopyridine nucleotide inhibitory site of glutamate dehydrogenase. *Biochemistry*, 25 (1986) 3508-3515.

4815 Bligny, R., Gaillard, J. and Douce, R.: Excretion of laccase by sycamore (*Acer pseudoplatanus* L.) cells. Effects of a copper deficiency. *Biochem. J.*, 237 (1986) 583-588.

4816 Craske, A. and Ferguson, S.J.: The respiratory nitrate reductase from *Paracoccus denitrificans*. Molecular characterisation and kinetic properties. *Eur. J. Biochem.*, 158 (1986) 429-436.

4817 Garrib, A. and McMurray, W.C.: Purification and characterization of glycerol-3-phosphate dehydrogenase (flavin-linked) from rat liver mitochondria. *J. Biol. Chem.*, 261 (1986) 8042-8048.

4818 Jouve, H.M., Pelmont, J. and Gaillard, J.: Interaction between pyridine adenine dinucleosides and bovine liver catalase: a chromatographic and spectral study. *Arch. Biochem. Biophys.*, 248 (1986) 71-79.

4819 Krüger, S. and Schlegel, W.: Prostaglandin-E_2 9-ketoreductase from human uterine decidua vera. *Eur. J. Biochem.*, 157 (1986) 481-485.

4820 Kurzban, G.P. and Strobel, H.W.: Preparation and characterization of FAD-dependent NADPH-cytochrome P-450 reductase. *J. Biol. Chem.*, 261 (1986) 7824-7830.

4821 Mercer, J.F.B., McAdam, W., Chambers, G.W. and Walker, I.D.: The W and L allelic forms of phenylalanine hydroxylase in the rat differ by a threonine to isoleucine substitution. *Biochem. J.*, 236 (1986) 679-683.

4822 Olsen, R.L., Steigen, T.K., Holm, T. and Little, C.: Molecular forms of myeloperoxidase in human plasma. *Biochem. J.*, 237 (1986) 559-565.

4823 Pawluk, A., Scopes, R.K. and Griffiths-Smith, K.: Isolation and properties of the glycolytic enzymes from *Zymomonas mobilis*. The five enzymes from glyceraldehyde-3-phosphate dehydrogenase through to pyruvate kinase. *Biochem. J.*, 238 (1986) 275-281.

4824 Preusch, P.C.: Lapachol inhibition of DT-diaphorase, (NAD(P)H:quinone dehydrogenase). *Biochem. Biophys. Res. Commun.*, 137 (1986) 781-787.

4825 Reuter, R., Naumann, M., Guettel, K. and Hofmann, E.: Interactions of immobilized and free triazine dyes with glucose-6-phosphate dehydrogenase from yeast. *Biomed. Biochim. Acta*, 45 (1986) 273-280; *C.A.*, 104 (1986) 202857m.

4826 Slabas, A.R., Sidebottom, C.M., Hellyer, A., Kessell, R.M.J. and Tombs, M.P.: Induction, purification and characterization of NADH-specific enoyl carrier protein reductase from developing seeds of oil seed rape (*Brassica napus*). *Biochim. Biophys. Acta*, 877 (1986) 271-280.

4827 Sloley, B.D. and Yu, P.H.: Improved method for the estimation of tryptophan hydroxylase activity using high-performance liquid chromatography with electrochemical detection. *J. Chromatogr.*, 363 (1986) 418-423.

4828 Townsend, D., Olds, D.P. and King, R.A.: DOPA oxidase activity of human hairbulbs measured by HPLC. *J. Invest. Dermatol.*, 86 (1986) 570-572; *C.A.*, 105 (1986) 2515g.

4829 Vogel, F. and Lumper, L.: Complete structure of the hydrophilic domain in the porcine NADPH-cytochrome P-450 reductase. *Biochem. J.*, 236 (1986) 871-878.

4830 Wallin, R.: Vitamin K antagonism of coumarin anticoagulation. A dehydrogenase pathway in rat liver is responsible for the antagonistic effect. *Biochem. J.*, 236 (1986) 685-693.

4831 Williams, R.A. and Andrews, P.: Purification of the fructose 1,6-biphosphate-dependent lactate dehydrogenase from *Streptococcus uberis* and an investigation of its existence in different forms. *Biochem. J.*, 236 (1986) 721-727.

For additional information see:
C.A., 104 (1986) 182232y.

See also 4750.

20b. Transferases (excluding E.C. 2.7.-.-)

4832 Croall, D.E. and DeMartino, G.N.: Calcium-dependent affinity purification of transglutaminase from rat liver cytosol. *Cell Calcium*, 7 (1986) 29-39; *C.A.*, 104 (1986) 182168g.

4833 Dostal, L.A., Aitio, A., Harris, C., Bhatia, A.V., Hernandez, O. and Bend, J.R.: Cytosolic glutathione S-transferases in various rat tissues differ in stereoselectivity with polycyclic arene and alkene oxide substrates. *Drug Metab. Disp.*, 14 (1986) 303-309.

4834 Falany, C.N., Green, M.D., Swain, E. and Tephly, T.R.: Substrate specificity and characterization of rat liver *p*-nitrophenol, 3α-hydroxysteroid and 17β-hydroxysteroid UDP-glucuronosyltransferases. *Biochem. J.*, 238 (1986) 65-73.

4835 Gomez-Cambronero, J., Velasco, S., Sanchez-Crespo, M., Vivanco, F. and Mato, J.M.: Partial purification and characterization of 1-O-alkyl-2-lyso-*sn*-glycerol-3-phosphocholine:acetyl-CoA acetyltransferase from rat spleen. *Biochem. J.*, 237 (1986) 439-445.

4836 Kwanyuen, P. and Wilson, R.F.: Isolation and purification of diacylglycerol acyltransferase from germinating soybean cotyledons. *Biochim. Biophys. Acta*, 877 (1986) 238-245.

4837 Miyaura, S. and Isono, H.: Purification and characterization of multiple forms of rabbit hepatic glutathione S-transferase. *Chem. Pharm. Bull.*, 34 (1986) 194-205.

4838 Moreno, S., Cardini, C.E. and Tandecarz, J.S.: α-Glucan synthesis on a protein primer, uridine diphosphoglucose: protein transglucosylase I. Separation from starch synthetase and phosphorylase and a study of its properties. *Eur. J. Biochem.*, 157 (1986) 539-545.

4839 Pajares, M.A., Villalba, M. and Mato, J.M.: Purification of phospholipid methyltransferase from rat liver microsomal fraction. *Biochem. J.*, 237 (1986) 699-705.

4840 Pallante, S.L., Lisek, C.A., Dulik, D.M. and Fenselau, C.: Glutathione conjugates. Immobilized enzyme synthesis and characterization by fast atom bombardment mass spectrometry. *Drug Metab. Disp.*, 14 (1986) 313-318.

4841 Saito, K., Shinohara, A., Kamataki, T. and Kato, R.: N-hydroxyarylamine O-acetyltransferase in hamster liver: Identity with arylhydroxamic acid N,O-acetyltransferase and arylamine N-acetyltransferase. *J. Biochem. (Tokyo)*, 99 (1986) 1689-1697.

4842 Shichi, H. and O'Meara, P.D.: Purification and properties of anionic glutathione S-transferase from bovine ciliary body. *Biochem. J.*, 237 (1986) 365-371.

4843 Warholm, M., Jensson, H., Tahir, M.K. and Mannervik, B.: Purification and characterization of three distinct glutathione transferases from mouse liver. *Biochemistry*, 25 (1986) 4119-4125.

For additional information see:
C.A., 104 (1986) 182452v, 202759f, 221365r.

20c. Transferases transferring phosphorus containing groups (E.C. 2.7.-.-)

4844 Cobb, M.H., Burr, J.G., Linder, M.E., Gray, T.B. and Gregory, J.S.: A similar ribosomal protein S6 kinase activity is found in insulin-treated 3T3-L1 cells and chick embryo fibroblasts transformed by Rous Sarcoma virus. *Biochem. Biophys. Res. Commun.*, 137 (1986) 702-708.

4845 Cochet, C. and Chambaz, E.M.: Catalytic properties of a purified phosphatidylinositol-4-phosphate kinase from rat brain. *Biochem. J.*, 237 (1986) 25-31.

4846 Goward, C.R., Hartwell, R., Atkinson, T. and Scawen, M.D.: The prufication and characterization of glucokinase from the thermophile *Bacillus stearothermophilus*. *Biochem. J.*, 237 (1986) 415-420.

4847 Keryy, J.A., Rohde, M. and Kwok, F.: Brain pyridoxal kinase. Purification and characterization. *Eur. J. Biochem.*, 158 (1986) 581-585.

4848 Liao, Y.-D., Tu, J., Feng, T.-Y. and Kuo, T.-T.: Characterization of phage-Xp10-coded RNA polymerase. *Eur. J. Biochem.*, 157 (1986) 571-577.

4849 Millar, G., Lewendon, A., Hunter, M.G. and Coggins, J.R.: The cloning and expression of the aroL gene from *Escherichia coli* K12. Purification and complete amino acid sequence of shikimate kinase II, the aroL-gene product. *Biochem. J.*, 237 (1986) 427-437.

4850 Suzuki, H., Quesada, P., Farina, B. and Leone, E.: *In vitro* poly(ADP-robosyl)-ation of seminal ribonuclease. *J. Biol. Chem.*, 261 (1986) 6048-6055.

4851 Waldmann, R., Bauer, S., Göbel, C., Hofmann, F., Jakobs, K.H. and Walter, U.: Demonstration of cGMP-dependent protein kinase and cGMP-dependent phosphorylation in cell-free extracts of platelets. *Eur. J. Biochem.*, 158 (1986) 203-210.

See also 4823, 4858.

20d. Hydrolases, acting on ester bonds (E.C. 3.1.-.-)

4852 Cordle, S.R., Colbran, R.J. and Yeaman, S.J.: Hormone-sensitive lipase from bovine adipose tissue. *Biochim. Biophys. Acta*, 887 (1986) 51-57.
4853 Ferris, D.K. and Rutherford, C.L.: Chromatographic resolution of soluble and particulate protein phosphatases from *Dictyostelium discoideum*. *Arch. Biochem. Biophys.*, 248 (1986) 10-20.
4854 Garcia-Segura, J.M., Orozco, M.N., Fominaya, J.M. and Gavilanes, J.G.: Purification, molecular and enzymic characterization of an acid RNase from the insect *Ceratitis capitata*. *Eur. J. Biochem.*, 158 (1986) 367-372.
4855 Hinderer, W., Köster, J. and Barz, W.: Purification and properties of a specific isoflavone 7-O-glucoside-6'' -malonate malonylesterase from roots of chick pea (*Cicer arectinum* L.). *Arch. Biochem. Biophys.*, 248 (1986) 570-578.
4856 Khatra, B.S.: Subunit structure and properties of the glycogen-bound phosphoprotein phosphatase from skeletal muscle. *J. Biol. Chem.*, 261 (1986) 8944-8952.
4857 Patterson, C.L., Jr. and Flavin, M.: A brain phosphatase with specificity for microtubule-associated protein-2. *J. Biol. Chem.*, 261 (1986) 7791-7796.
4858 Price, D.J., Tabarini, D. and Li, H.-C.: Purification, subunit composition and regulatory properties of the ATP.Mg^{2+}-dependent form of type I phosphoprotein phosphatase from bovine heart. *Eur. J. Biochem.*, 158 (1986) 635-645.
4859 Robbi, M. and Beaufay, H.: Biosynthesis of rat-liver pI-5.0 esterases in cell-free systems and in cultured hepatocytes. *Eur. J. Biochem.*, 158 (1986) 187-194.
4860 Sugimoto, Y. and Yamada, M.: Purification and characterization of benzoyl-L-tyrosine ethyl ester hydrolase from the yolk sac membrane of chicken egg. *Biochem. Cell Biol.*, 64 (1986) 543-548.
4861 Yang, S., Yu, J. and Fong, Y.: Purification and characterization of two inactive/latent protein phosphatases from pig brain. *J. Biol. Chem.*, 261 (1986) 5590-5596.

For additional information see:
C.A., 104 (1986) 223647h.

20e. Hydrolases, acting on glycosyl compounds (E.C. 3.2.-.-)

4862 Buchwaldt, L., Larsen, L.M., Plöger, A. and Sorensen, H.: Fast polymer liquid chromatography isolation and characterization of plant myrosinase, ß-thioglucoside glucohydrolase, isoenzymes. *J. Chromatogr.*, 363 (1986) 71-80.
4863 LaMarco, K.L. and Glew, R.H.: Hydrolysis of a naturally occuring ß-glucoside by a broad-specificity ß-glucosidase from liver. *Biochem. J.*, 237 (1986) 469-476.
4864 Suzuki, Y. and Tomura, Y.: Purification and characterization of *Bacillus coagulans* oligo-1,6-glucosidase. *Eur. J. Biochem.*, 158 (1986) 77-83.
4865 Xu, S. and Zhang, R.: (High performance size-exclusion liquid chromatographic separation and determination of lysozyme). *Sepu*, 4 (1986) 95-98; *C.A.*, 105 (1986) 30148k.

See also 4728.

20f. Other hydrolases

4866 4866 Bond, M.D., Auld, D.S. and Lobb, R.R.: A convenient fluorescnece assay for vertebrate collagenases. *Anal. Biochem.*, 155 (1986) 315-321.
4867 Brown, D.C. and Collins, K.D.: Dihydroorotase from *Escherichia coli*. Cloning the pyr^C gene and production of tryptic peptide maps. *J. Biol. Chem.*, 261 (1986) 5917-5919.
4868 Hausinger, R.P.: Purification of a nickel-containing urease from the rumen anaerobe *Selenomonas ruminantium*. *J. Biol. Chem.*, 261 (1986) 7866-7870.
4869 Hubert, J.J., Schenk, D.B., Skelly, H. and Leffert, H.L.: Rat hepatic (Na^+,K^+)-ATPase: α-subunit isolation by immunoaffinity chromatography and structural analysis by peptide mapping. *Biochemistry*, 25 (1986) 4156-4163.
4870 Kanamori, A., Serro, N. and Matsumoto, I.: Preparation of high-capacity affinity adsorbents using formyl carriers and their use for low- and high-performance liquid affinity chromatography of trypsin-family proteases. *J. Chromatogr.*, 363 (1986) 231-242.

4871 Matsuda, Y., Wakamatsu, N., Inouye, Y., Uede, S., Hashimoto, Y., Asano, K. and Nakamura, S.: Purification and characterization of creatine amidinohydrolase of *Alcaligenes* origin. *Chem. Pharm. Bull.*, 34 (1986) 2155-2160.

4872 Muir, A., Offord, R.E. and Davies, J.G.: The identification of a major product of the degradation of insulin by "insulin proteinase" (EC 3.4.22.11). *Biochem. J.*, 237 (1986) 631-637.

4873 Nakano, T. and Scott, P.G.: Purification and characterization of a gelatinase produced by fibroblast from human gingiva. *Biochem. Cell Biol.*, 64 (1986) 387-393.

4874 Robinson, A.K. and Barnes, L.D.: Three diadenosine 5',5'''-P^1,P^4-tetraphosphate hydrolytic enzymes from *Physarum polycephalum* with differential effects by calcium: a specific dinucleoside polyphosphate pyrophosphohydrolase, a nucleotide pyrophosphatase, and a phosphodiesterase. *Arch. Biochem. Biophys.*, 248 (1986) 502-515.

4875 Sakamoto, Y., Miyazaki, T., Kai, M. andOhkura, Y.: Sensitive assay for serum angiotensin-converting enzyme and separation of angiotensin analogues by high-performance liquid chromatography with fluorescence detection. *J. Chromatogr.*, 380 (1986) 313-320.

4876 Schär, H.-P., Holzmann, W., Ramos Tombo, G.M. and Ghisalba, O.: Purification and characterization of N,N-dimethylformamidase from *Pseudomonas* DMF 3/3. *Eur. J. Biochem.*, 158 (1986) 469-475.

4877 Shirasu, Y., Yoshida, H., Mikayama, T., Matsuki, S., Tanaka, J. and Ikenaga, H.: Isolation and expression in *Escherichia coli* of a cDNA clone encoding porcine pancreatic elastase. *J. Biochem. (Tokyo)*, 99 (1986) 1707-1712.

4878 Takahara, H., Okamoto, H. and Sugawara, K.: Affinity chromatography of peptidylarginine deaminase from rabbit skeletal muscle on a column of soybean trypsin inhibitor (Kunitz) - Sepharose. *J. Biochem. (Tokyo)*, 99 (1986) 1417-1424.

For additional information see:
C.A., 104 (1986) 203100w;
105 (1986) 20748q, 20761p.

20g. Lyases

4879 Childers, S.R.: A HPLC assay of brain adenylate cyclase using (^{2}H)ATP as substrate. *Neurochem. Res.*, 11 (1986) 161-171; *C.A.*, 104 (1986) 144386u.

4880 Mitchell, C.G., O'Neil, S., Reeves, H.C. and Weitzman, P.D.J.: Separation of isoenzymes of citrate synthase and isocitrate dehydrogenase by fast protein liquid chromatography. *FEBS Lett.*, 196 (1986) 211-214; *C.A.*, 104 (1986) 164071r.

4881 Toguri, T., Muto, S. and Miyachi, S.: Biosynthesis and intracellular processing of carbonic anhydrase in *Chlamydomonas reinhardtii*. *Eur. J. Biochem.*, 158 (1986) 443-450.

For additional information see:
C.A., 105 (1986) 20815j.

20h. Isomerases

4882 Hyder, S.M., Baldi, A., Crespi, M. and Wittliff, J.L.: Rapid purification of topoisomerase I from human breast cancer cells by high-performance liquid chromatography. *J. Chromatogr.*, 359 (1986) 433-447.

4883 Linden, K.G. and Benisek, W.F.: The amino acid sequence of a Δ^5-3-oxosteroid isomerase from *Pseudomonas putida* biotype B. *J. Biol. Chem.*, 261 (1986) 6454-6460.

20i. Ligases

4884 Kunugi, S., Uehara-Kunugi, Y., von der Haar, F., Schischkoff, J., Freist, W., Englisch, U. and Cramer, F.: Biochemical comparison of the *Neurospora crassa* wild type and the temperature-sensitive and leucine-auxotroph mutant leu-5. Purification of the cytoplasmic and mitochondrial leucyl-tRNA synthetases and comparison of the enzymatic activities and the degradation patterns. *Eur. J. Biochem.*, 158 (1986) 43-49.

4885 Valenzuela, D. and Schulman, L.H.: Identification of peptide sequences at the tRNA binding site of *Escherichia coli* methionyl-tRNA synthetase. *Biochemistry*, 25 (1986) 4555-4561.

For additional information see:
C.A., 105 (1986) 20854w.

See also 4910.

20j. Complex mixtures and incompletely identified enzymes

4886 Stepnaya, O.A., Severin, A.I. and Kulaev, I.S.: Bacteriolytic enzymes from the preparation of lysoamidase isolated from the bacterium of the *Pseudomonadaceae* family. *Biokhimiya (Moscow)*, 51 (1986) 1117-1123.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

4887 Akashi, M., Tokiyoshi, T., Miyauchi, N. and Mosbach, K.: Affinity chromatography of nucleosides and nucleic acid base derivatives with nucleic acid bases or nitrobenzeneboronic acid substituted silicas. *Nucleic Acids Symp. Ser.*, 16 (Symp. Nucleic Acids Chem., 13th) (1985) 41-44; *C.A.*, 104 (1986) 182629h.

4888 Altschuh, C.P. and Ungemach, F.R.: Eine einfache HPLC-Trennmethode für komplexe Gemische von Nuclobasen, Nucleosiden und Nucleosidmono-, -di- und -triphosphaten. *Fresenius' Z. Anal. Chem.*, 324 (1986) 316-317.

4889 Briggle, T.V., Boothman, D.A., Pfaffenberger, C.D. and Greer, S.: Analysis of 5-fluoro-2'-deoxycytidine and 5-trifluoromethyl-2'-deoxycytidine and their related antimetabolites by high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 343-355.

4890 Bünger, R. and Soboll, S.: Cytosolic adenylates and adenosine release in perfused working heart. Comparison of whole tissue with cytosolic non-aqueous fractionation analyses. *Eur. J. Biochem.*, 159 (1986) 203-213.

4891 Chan, T.C.K., Markman, M., Cleary, S. and Howell, S.B.: Plasma uridine changes in cancer patients treated with the combination of dipyridamole and N-phosphonacetyl-L-aspartate. *Cancer Res.*, 46 (1986) 3168-3172.

4892 De Bree, P.K., Wadman, S.K., Duran, M. and de Jonge, H.F.: Diagnosis of inherited adenylosuccinate deficiency by thin-layer chromatography of urinary imidazoles and by automated cation exchange column chromatography of purines. *Clin. Chim. Acta*, 156 (1986) 279-288.

4893 Dülffer, T., Hägele, E., Town, M.H. and Ziegenhorn, J.: Determination of serum uric acid with HPLC and column switching. *Fresenius' Z. Anal. Chem.*, 324 (1986) 333-334.

4894 Floyd, T.R., Yu, L.W. and Hartwick, R.A.: Use of diluted anion-exchange and hydrophobic properties in separating synthetic single-stranded oligodeoxyribonucleosides on mixed-ligand stationary phases. *Chromatographia*, 21 (1986) 402-408.

4895 Furlong, E.A., Jorgensen, T.J. and Henner, W.D.: Production of dihydrothymidine stereoisomers in DNA by γ-irradiation. *Biochemistry*, 25 (1986) 4344-4349.

4896 Halfpenny, A.P. and Brown, P.R.: Mixed mode chromatography *via* column switching for the simultaneous HPLC analysis of ionic and non-ionic nucleic acid constituents. *Chromatographia*, 21 (1986) 317-320.

4897 Johnson, G.S. and Lucas, D.L.: Formation of the N'-methylnicotinamide adenine dinucleotide derivative of NAD in intact rat pituitary tumor GH_3 and human promyelocytic leukemia HL-60 cells. *Arch. Biochem. Biophys.*, 249 (1986) 148-153.

4898 Krauss, G.-J.: Ligand-exchange HPLC of uracil derivatives on 8-hydroxyquinoline-silica-polyol. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 419-420.

4899 Montani, S., Tada, K. and Okaichi, T.: (High performance liquid chromatographic determination of nucleic acid bases in marine environmental samples). *Bunseki Kagaku*, 35 (1986) 618-621.

4900 Nakano, K.: HPLC analysis of oxypurines and related compounds. *Adv. Chromatogr.*, 25 (1986) 245-277; *C.A.*, 105 (1986) 21089n.

4901 Nguyen, T.T., Sporns, P. and Hadziyev, D.: Simultaneous liquid chromatographic determination of ribonucleoside-5'-monophosphates and their isomers in potato tubers. *J. Chromatogr.*, 363 (1986) 361-371.

4902 Rotin, D., Robinson, B. and Tannock, I.F.: Influence of hypoxia and an acidic environment on the metabolism and viability of cultured cells: potential implications for cell death in tumors. *Cancer Res.*, 46 (1986) 2821-2826.

4903 Saunders, P.P., Tan, M., Spindler, C.D., Robins, R.K. and Plunkett, W.: 3-Deazaguanosine is metabolized to the triphosphate derivative in chinese hamster cells deficient in hypoxanthine-guanine phosphoribosyltransferase. *J. Biol. Chem.*, 261 (1986) 6416-6422.

4904 Soto-Otero, R., Mendez-Alvarez, E. and Sierra-Marcuno, G.: Quantitative determination of uric acid in serum by reversed-phase liquid chromatography using an internal standard. *Anal. Lett.*, 19 (1986) 1107-1119.

4905 Tsujibo, H., Taniguchi, T., Koyama, I., Kubo, M. and Inamori, Y.: Hypotensive compounds isolated from the dried body of *Naja naja Kaouthia* Lesson. I. Isolation of inosine as a hypotensive principle and structure-activity study of related compounds. *Chem. Pharm. Bull.*, 34 (1986) 1716-1720.

4906 Wittwer, A. and Stadtman, T.C.: Biosynthesis of 5-methylaminomethyl-2-selenouridine, a naturally occurring nucleoside in *Escherichia coli* tRNA. *Arch. Biochem. Biophys.*, 248 (1986) 540-550.

4907 Yokota, Y. and Yasuhira, H.: (High performance liquid chromatographic determination of 5'-ribonucleotidic seasonings in miso). *Miso No Kagaku To Gijutsu*, 34 (1986) 65-69; *C.A.*, 105 (1986) 5247g.

4908 Zoch, E. and Höwer, H.: Quantitative Erfassung cyklischer Nucleotide in T-Lymphocyten durch HPLC. *Fresenius' Z. Anal. Chem.*, 324 (1986) 317-318.

4909 Zon, G., Gallo, K.A., Samson, C.J., Shao, K.L., Summers, M.F. and Byrd, R.A.: Analytical studies of "mixed sequence" oligodeoxyribonucleotides synthesized by competitive coupling of either methyl- or β-cyanoethyl-N,N-diisopropylamino phosphoramidite reagents, including 2'-deoxyinosine. *Nucleic Acid Res.*, 13 (1985) 8181-8196; *C.A.*, 105 (1986) 6756j.

For additional information see:
C.A., 104 (1986) 182620y;
105 (1986) 17726a.

See also 4654, 4849, 4851, 4854, 4929.

21b. Nucleic acids, RNA

4910 Airas, R.K., Schischkoff, J. and Cramer, F.: Biochemical comparison of the *Neurospora crassa* wild-type and the temperature-sensitive leucine-auxotroph mutant leu-5. Detailed kinetic comparison of the leucyl-tRNA synthetases. *Eur. J. Biochem.*, 158 (1986) 51-56.

4911 Kato, Y., Parvez, H. and Parvez, S.: Application of TSK-Gel SW in nucleic acid separation. *Prog. HPLC*, 1 (Gel Permeation Ion-Exch. Chromatogr. Proteins) (1985) 1-7; *C.A.*, 104 (1986) 203291j.

4912 Macdonell, M.T., Morris, S.C., Ortiz-Conde, B.A., Pillidge, C.J. and Coldwell, R.R.: Application of ion-exchange high-performance liquid chromatography in the purification of 5S rRNAs suitable for sequence analysis. *J. Chromatogr.*, 363 (1986) 438-443.

4913 McCoy, J.M., Keene, N.M. and Jones, D.S.: The nucleotide sequence of *Scenedesmus obliquus* chloroplast elongator methionine-accepting tRNA. *Biochem. J.*, 238 (1986) 297-300.

4914 Tinker, D., Geller, J., Romero, N., Cross, C. E. and Rucker, R.B.: Tropoelastin production and tropoelastin messenger RNA activity. Relationship to copper and elastin cross-linking in chick aorta. *Biochem. J.*, 237 (1986) 17-23.

For additional information see:
C.A., 104 (1986) 182830s.

21c. Nucleic acids, DNA

See 4911.

21d. Nucleoproteins

4915 Kohlstaedt, L.A., King, D.S. and Cole, R.D.: Native state of high mobility group chromosomal proteins 1 and 2 is rapidly lost by oxidation of sulfhydryl groups during storage. *Biochemistry*, 25 (1986) 4562-4565.

22. ALKALOIDS

4916 Dülffer, T., Hägele, E. and Herrmann, U.: Determination of theophylline in human sera with a HPLC column switching technique. *Presenius' Z. Anal. Chem., 324 (1986) 327-328.*

4917 Freytag, W.E.: Schöllkraut-Alkaloide. Quantitative Bestimmung der Alkaloide chelidonin, chelerythrin und sanguinarin in *Chelidonium majus* L. durch Hochdruckflüssigkeitschromatographie (HPLC). *Dtsch. Apoth.-Ztg.*, 126 (1986) 1113-1117.

4918 Kanamori, H., Sakamoto, I. and Mizuta, M.: Further study on mutagenic furoquinoline alkaloids of Dictamni Radicis Cortex: Isolation of skimmianine and high-performance liquid chromatographic analysis. *Chem. Pharm. Bull.*, 34 (1986) 1826-1829.

4919 Papadoyannis, I.N. and Caddy, B.: Rapid analysis for codeine by reversed-phase high-performance liquid chromatography. *Anal. Lett., 19 (1986) 1065-1081.*

4920 Smyth, R.M.: Determination of vincamine in plasma by high-performance liquid chromatography with voltametric detection. *Analyst (London)*, 111 (1986) 851-852.

4921 Wang, S.Y., Tham, S.Y. and Poon, M.K.: Thin-layer chromatographic and column liquid chromatographic analyses of morphine in urine *via* dabsylation. *J. Chromatogr.*, 381 (1986) 331-341.

For additional information see:
C.A., 104 (1986) 179600m, 184951f;
105 (1986) 30154g.

See also 5059, 5114.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23a. Porphyrins and other pyrroles

4922 De Matteis, F., Harvey, C. and Martin, S.R.: N-alkylation of exogenous haem analogues caused by drugs in isolated hepatocytes. Structural isomerism and chirality of the resulting porphyrins. *Biochem. J.*, 238 (1986) 263-268.

4923 Sinclair, P.R., Bement, W.J., Bonkovsky, H.L., Lambrecht, R.W., Frezza, J.E., Sinclair, J.F., Urquhart, A.J. and Elder, G.H.: Uroporphyrin accumulation produced by halogenated biphenyls in chick-embryo hepatocytes. Reversal of the accumulation by piperonyl butoxide. *Biochem. J.*, 237 (1986) 63-71.

See also 4504.

23b. Bile pigments

4924 Singh, J. and Bowers, L.D.: Quantitative fractionation of serum bilirubin species by reversed-phase high-performance liquid chromatography. *J. Chromatogr., 380 (1986) 321-330.*

23c. Indole derivatives

4925 Baars, J.D., van Haard, P.M.M. and Lombarts, A.J.P.F.: Assay of urinary 5-hydroxyindole-3-acetic acid: two methodologies compared. *Clin. Chim. Acta*, 158 (1986) 173-178.

4926 Jira, T., Reinhardt, K., Beyrich, T., Grimm, U. and Knapp, A.: HPLC identification of xanthurenic acid in the presence of other tryptophan metabolites by formation of ion-pair with CTAB. *Zentralbl. Pharm., Pharmakother. Laboratoriumsdiagn.*, 125 (1986) 21-23; *C.A.*, 104 (1986) 203286m.

4927 Schumann, G.: Referenzmethode für die Kreatinin-Bestimmung durch Hochdruckflüssigkeits-Chromatographie. *Fresenius' Z. Anal. Chem.*, 324 (1986) 209-211.

4928 Schumann, G. and Büttner, J.: A candidate reference method for creatinine with HPLC. *Fresenius' Z. Anal. Chem.*, 324 (1986) 278-279.

4929 Siekmann, L., Siekmann, A., Mackrodt, D. and Johnen, C.: Isotope dilution - high-performance liquid chromatography as a new technique for the development of reference methods. Determination of creatinine and uric acid in human serum. *Fresenius' Z. Anal. Chem.*, 324 (1986) 279-280.

4930 Stobaugh, J.F., Repta, A.J. and Sternson, L.A.: Aspects of the stability of isoindoles derived from the reaction of *o*-phthalaldehyde-ethanethiol with primary amino compounds. *J. Pharm. Biomed. Anal.*, 4 (1986) 341-351.

4931 Wakabayashi, H., Shimada, K. and Aizawa, Y.: Variation of melatonin and serotonin content in rat pineal gland with sex and oestrous phase difference determined by high-performance liquid chromatography with fluorimetric detection. *J. Chromatogr.*, 381 (1986) 21-28.

See also 4654, 5154.

23e. Other N-heterocyclic compounds

4932 Guenther, F.R., Chesler, S.N. and Parris, R.M.: Analysis of nitrogen heterocycles in shale oil by a dual capillary column heart cutting technique. *J. Chromatogr.*, 363 (1986) 199-205.

4933 Steinheimer, T.R. and Ondrus, M.G.: Determination of selected azaarenes in water by bonded-phase extraction and liquid chromatography. *Anal. Chem.*, 58 (1986) 1839-1844.

4934 Stringari, G.: (Simultaneous determination by HPLC of benzimidazole and thiabendazole derivative residues). *Inf. Fitopatol.*, 35 (1985) 48-50; *C.A.*, 104 (1986) 223693v.

4935 Tomingas, R., Mönch, W. and Matthiesen, U.: Remarks on the detection of aza arenes in air-bone particulates. *Chromatographia*, 21 (1986) 327-330.

24. ORGANIC SULPHUR COMPOUNDS

4936 Borghoff, S.J. and Birnbaum, L.S.: Age-related changes in the metabolism and excretion of allyl isothiocyanate. A model compound for glutathione conjugation. *Drug Metab. Disp.*, 14 (1986) 417-422.

4937 Steudel, R., Strauss, R. and Jensen, D.: (Sulphur compounds. 93. Qualitative and quantitative HPLC analysis for chlorosulphanes S_nCl_2 (n=1-30) after derivatization). *Chem.-Ztg.*, 109 (1985) 349-350; *C.A.*, 104 (1986) 236337g.

4938 Wang, D., Chen, F., Chen, F. and Ba, H.: (Effect of the composition of the mobile phase on retention behavior of anthracenemonosulphonic acids on an ODS column). *Sepu*, 4 (1986) 14-18; *C.A.*, 105 (1986) 17568a.

4939 Yamaoka, K., Nakajima, K., Moriyama, H., Saito, Y. and Sato, T.: Determination of sodium dodecyl sulfate in hydrophilic ointments by thin-layer chromatography with flame ionization detection. *J. Pharm. Sci.*, 75 (1986) 606-607.

25. ORGANIC PHOSPHORUS COMPOUNDS

4940 Ramsey, R.S.: Liquid chromatographic analysis of the oxo acids of phosphorus. *Adv. Chromatogr. (N.Y.)*, 25 (1986) 219-244; *C.A.*, 104 (1986) 236253b - a review with 67 refs.

4941 Turk, J., Wolf, B.A. and McDaniel, M.L.: Glucose-induced accumulation of inositol biphosphates in isolated pancreatic islets. Predominance of the 1,3,4-isomer. *Biochem. J.*, 237 (1986) 259-263.

See also 4460, 4485, 4541, 4978, 5158.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26c. Coordination compounds

4942 Haj-Hussein, A.T.: High-performance liquid chromatography of copper, mercury, nickel and cadmium bisdibenzyldithiocarbamate complexes. *Anal. Lett.*, 19 (1986) 1191-1198.

4943 Hamano, T., Mitsuhashi, Y., Tanaka, K., Matsuki, Y., Tonogai, Y., Nakamura, K. and Ito, Y.: (Separation and determination of disodium EDTA and EDTA metal chelates in foods by column chromatography). *Shokuhin Eiseigaku Zasshi*, 26 (1985) 630-637; *C.A.*, 104 (1986) 223716e.

27. VITAMINS AND VARIOUS GROWTH REGULATORS (NON-PEPTIDIC)

4944 Allegra, C.J., Fine, R.L., Drake, J.C. and Chabner, B.A.: The effect of methotrexate on intracellular folate pools in human MCF-7 breast cancer cells. Evidence for direct inhibition of purine synthesis. *J. Biol. Chem.*, 261 (1986) 6478-6485.

4945 Chaouch, A., Michel, M., Dordonnat, J.M., Tisse, C. and Lesgards, G.: (Study on tocopherols in vegetable oils by voltammetry and liquid chromatography). *Ann. Falsif. Expert. Chim. Toxicol.*, 78 (1985) 383-390; *C.A.*, 104 (1986) 205635y.

4946 Howells, D.W., Smith, I. and Hyland, K.: Estimation of tetrahydrobiopterin and other pterins in cerebrospinal fluid using reversed-phase high-performance liquid chromatography with electrochemical and fluorescence detection. *J. Chromatogr.*, 381 (1986) 285-294.

4947 Huang, M.-L., Burckart, G.J. and Venkataramanan, R.: Sensitive high-performance liquid chromatographic analysis of plasma vitamin E and vitamin A using amperometric and ultraviolet detection. *J. Chromatogr.*, 380 (1986) 331-338.

4948 Katsui, G.: (Standards for fat-soluble vitamins for HPLC). *Bitamin*, 60 (1986) 145-156; *C.A.*, 105 (1986) 2893d - a review with 14 refs.

4949 Kittang, E., Torjesen, P. and Schjoensby, H.: Determination of the R-protein and the R-protein-vitamin B_{12}-complex in saliva and gastrointestinal juice by FPLC Mono S cationic chromatography. *Scand. J. Clin. Lab. Invest.*, 45 (1985) 237-244; *C.A.*, 105 (1986) 2939y.

4950 Lawson, D.E.M., Douglas, J., Lean, M. and Sedrani, S.: Estimation of vitamin D_3 and 25-hydroxyvitamin D_3 in muscle and adipose tissue of rats and man. *Clin. Chim. Acta*, 157 (1986) 175-182.

4951 Mulholland, M.: Linking low dispersion liquid chromatography with diode-array detection for the sensitive determination of vitamins A, D and E. *Analyst (London)*, 111 (1986) 601-604.

4952 Norris, R.L.G., Thomas, M.J. and Craswell, P.W.: Assessment of a two-step high-performance liquid chromatographic assay using dual-wavelength ultraviolet monitoring for 25-hydroxyergocalciferol and 25-hydroxycholecalciferol in human serum or plasma. *J. Chromatogr.*, 381 (1986) 53-61.

4953 Shen, C.S.J. and Sheppard, A.J.: A rapid high-performance liquid chromatographic method for separating tocopherols. *J. Micronutr. Anal.*, 2 (1986) 43-53; *C.A.*, 105 (1986) 23166j.

4954 Shimada, H.: (Determination of cobalamin (vitamin B_{12}) in premixes). *Chikusan No Kenkyu*, 39 (1985) 1422-1427 continued on to 40 (1986) 40-42; *C.A.*, 105 (1986) 23164g.

4955 Stupperich, E., Steiner, I. and Rühlemann, M.: Isolation and analysis of bacterial cobamides by high-performance liquid chromatography. *Anal. Biochem.*, 155 (1986) 365-370.

4956 Van Haard, P.M.M., Engel, R. and Pietersma-de Bruyn, A.L.J.M.: Quantitation of trans-vitamin K1 in small serum samples by off-line multidimensional liquid chromatography. *Clin. Chim. Acta*, 157 (1986) 221-230.

4957 Wallingford, J.C. and Underwood, B.A.: Rapid preparation of anhydroretinol and its use as an internal standard in determination of liver total vitamin A by high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 158-163.

For additional information see:
C.A., 104 (1986) 230355q;
105 (1986) 12247k, 21174m.

See also 4654.

28. ANTIBIOTICS

4958 Bayoumi, S.M., Vallner, J.J. and DiPiro, J.T.: Quantitation of cefazolin sodium in plasma and tissues by HPLC. *Int. J. Pharm.*, 30 (1986) 57-61; *C.A.*, 105 (1986) 17738f.

4959 Beijnen, J.H., Lingeman, H., van Munster, H.A. and Uderberg, W.J.M.: Mitomycin antitumour agents: a review of their physico-chemical and analytical properties and stability. *J. Pharm. Biomed. Anal.*, 4 (1986) 275-295.

4960 Carr, B.I., Langley, D., Dias, C.B., Hammond, W.G. and Benfield, J.R.: Differential interaction of normal and preneoplastic hamster bronchi with adriamycin. *Cancer Res.*, 46 (1986) 2730-2734.

4961 Cummings, J., Merry, S. and Willmott, N.: Disposition kinetics of adriamycin, adriamycinol and their 7-deoxyaglycones in AKR mice bearing a sub-cutaneously growing Ridgway osteogenic sarcoma. *Eur. J. Cancer Clin. Oncol.*, 22 (1986) 451-460; *C.A.*, 105 (1986) 151m.

4962 Haagsma, N., Schreuder, C. and Rensen, E.R.A.: Rapid sample preparation method for the determination of chloramphenicol in swine muscle by high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 353-359.

4963 Haginaka, J. and Wakai, J.: Epimerization of amoxicillin piperazine-2,5-dione in acidic solutions. *Chem. Pharm. Bull.*, 34 (1986) 2239-2242.

4964 Haginaka, J. and Wakai, J.: Liquid chromatographic determination of penicillins by postcolumn degradation with sodium hypochloride. *Anal. Chem.*, 58 (1986) 1896-1898.

4965 Hoshino, Y., Horie, M., Nose, N. and Iwasaki, H.: (Determination of monensin in chicken meat by HPLC). *Shokuhin Eiseigaku Zasshi*, 26 (1985) 585-590; *C.A.*, 104 (1986) 223718g.

4966 Jensen, S.E., Westeake, D.W.S., Bowers, R.J., Lyubechansky, L. and Wolfe, S.: Synthesis of benzylpenicillin by cell-free extracts from *Streptomyces clavuligerus*. *J. Antibiot.*, 39 (1986) 822-826.

4967 Lovering, A.M., White, L.O. and Reeves, D.S.: The identification of the aminoglycoside-phosphorylating enzymes APH(2") and APH(3') from the characterization of their reaction products by HPLC. *J. Antimicrob. Chemother.*, 17 (1986) 147-154; *C.A.*, 104 (1986) 182096g.

4968 Maniez-Devos, D.M., Baurain, R., Lesne, M. and Trouet, A.: Degradation of doxorubicin and daunorubicin in human and rabbit biological fluids. *J. Pharm. Biomed. Anal.*, 4 (1986) 353-365.

4969 Nagata, T. and Saeki, M.: Determination of ampicillin residues in fish tissues by liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 448-450.

4970 Nemer, U.: (Liquid chromatographic behavior of 7-aminocephalosporanic acid and some of its derivatives). *Tr. Nauchnoizsled. Khim.-Farm. Inst.*, 15 (1985) 103-111; *C.A.*, 105 (1986) 24088x.

4971 Sharman, J.R. and Howarth, A.: Modified method for the determination of moxalactam in plasma by high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 447-452.

4972 Smyth, W.F., Ayling, C. and Smyth, J.G.: Recent advances in the high-performance liquid chromatography analysis of veterinary antimicrobials. *Anal. Proc. (London)*, 23 (1986) 84-87; *C.A.*, 105 (1986) 30130w - a review with 28 refs.

4973 Stong, J.D.: Determination of efrotomycin in feeds by high-performance liquid chromatography. *Analyst (London)*, 111 (1986) 853-855.

4974 Takatsuki, K., Suzuki, S. and Ushizawa, I.: Liquid chromatographic determination of monensin in chicken tissues with fluorometric detection and confirmation by gas chromatography-mass spectrometry. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 443-448.

4975 Van Gulpen, C., Brokerhof, A.W., van der Kaay, M., Tjaden, U.R. and Mattie, H.: Determination of benzylpenicillin and probenecid in human body fluids by high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 365-372.

For additional information see:
C.A., 105 (1986) 17743d, 30144d, 30145e.

See also 5159.

29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS

See 5153.

29a. Chlorinated insecticides

4976 De Voogt, P., Klamer, J.C. and Govers, H.: Simultaneous clean up and fractionation of organochlorine compounds by adsorption chromatography. *J. Chromatogr.*, 363 (1986) 407-411.
4977 LeBel, G.L. and Williams, D.T.: Determination of halogenated contaminants in human adipose tissue. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 451-458.

29d. Herbicides

4978 Lundgren, L.N.: A new method for the determination of glyphosate and (aminomethyl) phosphonic acid residues in soils. *J. Agric. Food Chem.*, 34 (1986) 535-538.
4979 Miles, C.J., Wallace, L.R. and Moye, H.A.: Determination of glyphosate herbicide and (aminomethyl)phosphonic acid in natural waters by liquid chromatography using pre-column fluorogenic labeling with 9-fluorenylmethyl chloroformate. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 458-461.

29e. Fungicides

4980 Kennedy, M.J.: High-performance liquid chromatographic analysis of preservative-treated timber for 2-(thiocyanomethylthio)benzothiazole and methylene bis-thiocyanate. *Analyst (London)*, 111 (1986) 701-705.
4981 Slahck, S.C.: Liquid chromatographic method for determination of oxythioquinox in technical and formulated products: collaborative study. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 490-492.

29f. Other types of pesticides and various agrochemicals

4982 Ando, T., Kurotsu, Y. and Uchiyama, M.: HPLC separation of the stereoisomers of natural pyrethrins and related compounds. *Agric. Biol. Chem.*, 50 (1986) 491-493; *C.A.*, 104 (1986) 202159k.
4983 Kobayashi, H., Matano, O. and Goto, S.: An improved method for residue analysis of ethylenethiourea in vegetables by HPLC. *Nippon Noyaku Gakkaishi*, 11 (1986) 81-84; *C.A.*, 105 (1986) 19942s.
4984 Szabo Ravasz, B.: (Reversed-phase ion-pair chromatographic method for the determination of nevirol). *Nehezvegyip. Kut. Intez. Kozl.*, 16 (1986) 121-126; *C.A.*, 104 (1986) 202162f.

For additional information see:
C.A., 104 (1986) 220642s.

See also 4981.

30. SYNTHETIC AND NATURAL DYES

30a. Synthetic dyes

4985 Gardner, M.J.: Micromethod for the analysis of Evans Blue in plasma using ion-pair high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 295-303.
4986 Nelis, H.J.C.F. and De Leenheer, A.P.: Quality control of azure B preparations by liquid chromatography and standardization with azure B tetrafluoroborate. *Clin. Chim. Acta*, 156 (1986) 247-258.
4987 Scher, A.L. and Murray, H.D.: Liquid chromatographic determination of leuco base in FD&C Blue No. 1. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 478-482.
4988 Serafimov, O., Kopp, C. and Berg, M.: (Thin-layer and column-chromatographic separation with photometric determination of dyes). *Prax. Naturwiss., Chem.*, 35 (1986) 35-37; *C.A.*, 105 (1986) 23636n.
4989 Torres de Toledo e Souza, I., Sosa de Pereira, N. and Goncalves da Silva, C.P.: Determination of inorganic radioiodine in iodine-131-labled Rose Bengal and iodine-131-labeled bromosulphophtalein. *Publ. IPEN 1985, IPEN Publ. 79*, 8 pp.; *C.A.*, 104 (1986) 193319h.

30b. Chloroplast and other natural pigments

4990 Khachik, F., Beecher, G.R. and Whittaker, N.F.: Separation, identification, and quantification of the major carotenoid and chlorophyll constituents in extracts of several green vegetables by liquid chromatography. *J. Agric. Food Chem.*, 34 (1986) 603-616.

31. PLASTICS AND THEIR INTERMEDIATES

4991 Lazaris, A.Ya. and Beloded, L.N.: (Reversed-phase liquid chromatography of oligoethylene glycol esters). *Zh. Anal. Khim.*, 41 (1986) 345-349; *C.A.*, 104 (1986) 208012d.
4992 Ludwig, F.J., Sr. and Bailie, A.G., Jr.: Reversed-phase liquid chromatographic separation of *p-tert.*-butylphenol-formaldehyde linear and cyclic oligomers. *Anal. Chem.*, 58 (1986) 2069-2072.
4993 Jandera, P. and Rozkosna, J.: Isocratic and gradient-elution liquid chromatography of styrene oligomers on silica gel. *J. Chromatogr.*, 362 (1986) 325-343.
4994 Nagy, D.J.: Molecular weight determination of poly(vinyl alcohol) using aqueous size exclusion chromatography/low-angle laser light scattering. *J. Polym. Sci., Part C: Polym. Lett.*, 24 (1986) 87-93; *C.A.*, 104 (1986) 225532r.
4995 Grinshpun, V., Rudin, A., Russel, K.E. and Scammell, M.V.: Long-chain branching indexes from size-exclusion chromatography of polyethylenes. *J. Polym. Sci., Part B: Polym. Phys.*, 24 (1986) 1171-1176; *C.A.*, 104 (1986) 225519s.
4996 He, Z., Zhang, X. and Cheng, R.: (Measurement of narrow distributed polystyrene manufactured in China by gel permeation chromatography-laser small-angle light scattering). *Sepu*, 4 (1986) 22-25; *C.A.*, 105 (1986) 7121k.
4997 Szewczyk, P.: (Determination of true calibration relations in gel permeation chromatography using polymolecular polymer standards. Universal calibration). *Polimery (Warsaw)*, 31 (1986) 8-11; *C.A.*, 105 (1986) 7118q.
4998 Henke, H. and Schubert, J.: Preparative gel-chromatographic separation of the hydrolysis products of polycarbonate on Sephadex LH-20. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 361.

For additional information see:
C.A., 104 (1986) 225482z;
105 (1986) 12776g, 24942w, 7713e.

See also 4415, 4660, 5149.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. Synthetic drugs

4999 Labat, C., Mansour, K., Malmary, M.F., Casanovas, A.M. and Oustrin, J.: (Determination of methotrexate, its impurities and metabolites by HPLC). *J. Pharm. Belg.*, 41 (1986) 29-34; *C.A.*, 104 (1986) 218522j.

5000 Chen, J., Wang, F. and Yang, S.: (Determination of two growth stimulator nitrovin in animal feeds by HPLC). *Fenxi Huaxue*, 13 (1985) 935-937; *C.A.*, *105 (1986) 23190n.*

5001 Hara, M., Hayashi, H., Yoshida, T. and Murayama, H.: Studies on the kinetics and mechanism of drug degradation. I. Kinetics and mechanism of degradation of chlorphenesin carbamate in strongly alkaline aqueous solutions. *Chem. Pharm. Bull.*, 34 (1986) 1764-1769.

5002 Fyhr, P., Brodin, A., Ernerot, L. and Lindquist, J.: Degradation pathway of pralidoxime chloride in concentrated acidic solution. *J. Pharm. Sci.*, 75 *(1986) 608-611.*

5003 Olgemöller, B., Deufel, T., Schleicher, E. and Gerbitz, K.-D.: Rapid determination of serum suramin levels using isocratic HPLC separation. *Fresenius' Z. Anal. Chem.*, 324 (1986) 356.

5004 Sirowej, H., Bussemas, H.H. and Harhoff, F.: Reduzierung der Zahl mobiler Phasen bei der Analytik verschiedener Pharmaka mittels HPLC. *Fresenius' Z. Anal. Chem.*, 324 (1986) 349-350.

5005 Blaschke, G., Kley, H. and Müller, W.E.: Razemattrennung der Benzodiazepine Camazepam und Ketazolam und Rezeptorbindung der Enantiomeren. *Arzneim.-Forsch.*, 36 (1986) 893-894.

5006 Cockaerts, P., Roets, E. and Hoogmartens, J.: Analysis of a complex analgesic formulation by high-performance liquid chromatography with column-switching. *J. Pharm. Biomed. Anal.*, 4 (1986) 367-376.

5007 Das Gupta, V. and Dhruv, A.B.: Quantitation of hydrochlorothiazide in combination with methyldopa and propranolol hydrochloride by high-performance liquid chromatography. *Drug Dev. Ind. Pharm.*, 12 (1986) 691-700; *C.A.*, 105 (1986) 12231a.

5008 Halkiewicz, J. and Halkiewicz, A.: (Organic contaminations in sodium bicarbonate used for the production of infusion solutions. Part I. Polycyclic aromatic hydrocarbons). *Farm. Pol.*, 41 (1985) 711-714; *C.A.*, 105 (1986) 30172m.

5009 Miething, H., Holz, W. and Haensel, R.: (HPLC content determination of aucubin in drugs and preparations). *Pharm. Ztg.*, 131 (1986) 746-747; *C.A.*, 105 (1986) 30147g.

5010 Feibush, B., Figueroa, A., Charles, R., Onan, K.D., Feibusch, P. and Karger, B.L.: Chiral separation of heterocyclic drugs by HPLC: solute-stationary phase base-pair interactions. *J. Am. Chem. Soc.*, 108 (1986) 3310-3318; *C.A.*, 104 (1986) 230315b.

5011 Burdanov, V. and Miteva, M.: Simple, rapid and high sensitivite HPLC method for determination of platinum(II) antineoplastic drugs. *Dokl. Bolg. Akad. Nauk*, 39 (1986) 61-64; *C.A.*, 104 (1986) 230598w.

5012 Gazdag, M., Szepesi, G., Varsanyi-Riedl, K. and Tuba, Z.: HPLC of pipecuronium bromide (Arduan) and related compounds. *Anal. Chem. Symp. Ser.*, 23 (1985) 431-444; *C.A.*, 104 (1986) 230545b.

5013 Smith, R.M., Hurdley, T.G., Gill, R. and Moffat, A.C.: Retention reproducibility. Application of retention indices to drug identification. *LC-GC*, 4 (1986) 314-326; *C.A.*, *104 (1986) 230542y.*

5014 Kawahara, T., Mizuno, K., Shin, S. and Mizogami, H.: (Removal of pyrogenic substances from solution by using column chromatography). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 56,133 (86 56, 133) (Cl. A61K37/00), 20 Mar. 1986, Appl. 84/177, 349, 24 Aug. 1984; 5 pp.; *C.A.*, 104 (1986) 230447w.

5015 Mompon, B., Loyaux, D., Kauffmann, E. and Krstulovic, A.M.: E-Z Isomerism of progabide in polar solvents. *J. Chromatogr.*, 363 (1986) 372-381.

5016 Biffar, S.E. and Mazzo, D.J.: Reversed-phase determination of famotidine, potential degradates, and preservatives in pharmaceutical formulations by high-performance liquid chromatography using silica as a stationary phase. *J. Chromatogr.*, 363 (1986) 243-249.

5017 Gagliardi, L., Amato, A., Basili, A., Cavazzutti, G., Gattavecchia, E. and Tonelli, D.: Determination of sun-screen agents of the *p*-aminobenzoic acid type in cosmetic products by reversed-phase high-performance liquid chromatography. *J. Chromatogr.*, 362 (1986) 450-454.

5018 Papadoyannis, I.N. and Caddy, B.: A rapid isocratic reversed-phase separation and determination of some barbiturates by high-performance liquid chromatography. *Anal. Lett.*, 19 (1986) 1037-1052.

5019 Jun, H.W., Foda, N.H. and Chi, S.C.: High performance liquid chromatographic assay of phenacemide in tablets. *Anal. Lett.*, 19 (1986) 575-586.

5020 Isaksson, R. and Lamm, B.: Semipreparative separation of cyclic carbamates of beta-blocking agents by liquid chromatography on swollen microcrystalline triacetylcellulose. *J. Chromatogr.*, 362 (1986) 436-438.

5021 Kountourellis, J.E., Raptouli, A. and Georgakopoulos, P.P.: Simultaneous determination of bromochlorosalicylanilide and bamipine in pharmaceutical formulations by high-performance liquid chromatography. *J. Chromatogr.*, 362 (1986) 439-442.

5022 Everett, R.L.: Liquid chromatographic determination of chlorpropamide in tablet dosage forms: collaborative study. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 519-521.

5023 Pettersson, C. and Josefsson, M.: Chiral separation of aminoalcohols by ion-pair chromatography. *Chromatographia*, 21 (1986) 321-326.

5024 Schumann, G., Oellerich, M., Wonigeit, K. and Wrenger, M.: Cyclosporin: HPLC routine method with column switching. *Fresenius' Z. Anal. Chem.*, 324 (1986) 328-329.

For additional information see:
C.A., 104 (1986) 199586q, 230582m;
105 (1986) 97y, 11826m, 12228e, 12237g.

See also 4508, 4939, 4972.

32b. Pharmacokinetics studies

5025 Lentjes, E.G.W.M., Tan, Y. and van Ginneken, C.A.M.: Determination of sulfinpyrazone and four metabolites in plasma and urine by high-pressure liquid chromatography. *Pharm. Weekbl., Sci. Ed.*, 7 (1986) 252-259; *C.A.*, 104 (1986) 179608v.

5026 Hsieh, J.Y.-K., Maglietto, B.K. and Bayne, W.F.: Fast high-performance liquid chromatographic determination of R(+) [5,6-dichloro-2,3,9,9a-tetrahydro-3-oxo-9a-propyl-1-H-fluoren-7-yl)oxy]acetic acid in human plasma and urine. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 392-396.

5027 Gerson, B., Chan, S., Bell, F. and Papalardo, K.M.: Trazodone: A simple, clean extraction and rapid quantification by high pressure liquid chromatography. *J. Psychiatr. Res.*, 20 (1986) 69-76; *C.A.*, 105 (1986) 17731y.

5028 Camus, P. and Mehendale, H.M.: Pulmonary sequestration of amiodarone and desethylamiodarone. *J. Pharmacol. Exp. Ther.*, 237 (1986) 867-873.

5029 De Flines, E.W. and Komen, B.J.: (High-performance liquid chromatographic measurement of amiodarone and N-desethylamiodarone in serum). *Ziekenhuisfarmacie*, 1 (1985) 84-86; *C.A.*, 105 (1986) 130d.

5030 Snedden, W., Fernandez, P.G. and Nath, C.: HPLC analysis of nifedipine and some of its metabolites in hypertensive patients. *Can. J. Physiol. Pharmacol.*, 64 (1986) 290-296; *C.A.*, 105 (1986) 75q.

5031 Chang, S.-L., Emmick, K. and Wedlund, P.J.: Characterization of antipyrine autoinduction in the rat utilizing a new microsampling technique for serial blood sample collections. *J. Pharm. Sci.*, 75 (1986) 456-458.

5032 Buur, A. and Bundgaard, H.: Prodrugs of 5-fluorouracil V. 1-Alkoxycarbonyl derivatives as potential prodrug forms for improved rectal or oral delivery of 5-fluorouracil. *J. Pharm. Sci.*, 75 (1986) 522-527.

5033 Yu, D.K., Dimmit, D.C., Lanman, R.C. and Giessing, D.H.: Pharmacokinetics of dothiepin in humans: a single dose dose-proportionality study. *J. Pharm. Sci.*, 75 (1986) 582-585.

5034 Hsyu, P.-H. and Giacomini, K.M.: High performance liquid chromatographic determination of the enantiomers of 3-adrenoceptor blocking agents in biological fluids. I: Studies with pindolol. *J. Pharm. Sci.*, 75 (1986) 601-605.

5035 Benckhuijsen, C., Varossieau, F.J., Hart, A.A.M., Wieberdink, J. and Noordhoek, J.: Pharmacokinetics of melphalan in isolated perfusion of the limbs. *J. Pharmacol. Exp. Ther.*, 237 (1986) 583-588.

5036 Newton, J.F., Hoefle, D., Gemborys, M.W., Mudge, G.H. and Hook, J.B.: Metabolism and excretion of a glutathione conjugate of acetaminophen in the isolated perfused rat kidney. *J. Pharmacol. Exp. Ther.*, 237 (1986) 519-524.

5037 Quon, C.Y. and Gorczynski, R.J.: Pharmacodynamics and onset of action of esmolol in anesthetized dogs. *J. Pharmacol. Exp. Ther.*, 237 (1986) 912-918.

5038 Green, C.E., LeValley, S.E. and Tyson, C.A.: Comparison of amphetamine metabolism using isolated hepatocytes from five species including human. *J. Pharmacol. Exp. Ther.*, 237 (1986) 931-936.

5039 Kelly, J.A. and Fletcher, K.A.: High-performance liquid chromatographic method for the determination of proguanil and cycloguanil in biological fluids. *J. Chromatogr.*, 381 (1986) 464-471.

5040 Cossum, P.A., Roberts, M.S., Yong, A.C. and Kilpatrick, D.: Distribution and metabolism of nitroglycerin and its metabolites in vascular beds of sheep. *J. Pharmacol. Exp. Ther.*, 237 (1986) 959-966.

5041 Bidiville, J. and Roch-Ramel, F.: Competition of organic anions for furosemide and *p*-aminohippurate secretion in the rabbit. *J. Pharmacol. Exp. Ther.*, 237 (1986) 636-643.

5042 Gallaher, E.J., Henauer, S.A., Jacques, C.J. and Hollister, L.E.: Benzodiazepine dependence in mice after ingestion of drug-containing food pellets. *J. Pharmacol. Exp. Ther.*, 237 (1986) 462-467.

5043 Elmarakby, S.A., Clark, A.M., Baker, J.K. and Hufford, C.D.: Microbial metabolism of bornaprine, 3-(diethylamino)propyl 2-phenylbicyclo[2.2.1]heptane-2-carboxylate. *J. Pharm. Sci.*, 75 (1986) 614-618.

5044 Baxter, J.G., Brass, C., Schentag, J.J. and Slaughter, R.L.: Pharmacokinetics of ketoconazole administered intravenously to dogs and orally as tablet and solution to humans and dogs. *J. Pharm. Sci.*, 75 (1986) 443-448.

5045 Michos, N., Zullinger, H.W., Barkworth, M.F., Johnson, K.J., Rehm, K.D., Töberich, H. and Klein, G.: Suprofen sustained release kinetics in healthy male volunteers. 1st communication: A single dose open crossover bioavailability study of suprofen sustained release tablets *versus* capsules. *Arzneim.-Forsch.*, 36 (1986) 941-948.

5046 Grundevik, I., Jerndal, G., Balmer, K. and Persson, B.-A.: Fully automated gradient elution liquid chromatographic assay of omeprazole and two metabolites. *J. Pharm. Biomed. Anal.*, 4 (1986) 389-398.

5047 Schulze, J., Weller, O. and König, W.A.: Resolution of enantiomers of ß-blocking agents by HPLC on silica gel with covalently bound monosaccharides. *Fresenius' Z. Anal. Chem.*, 324 (1986) 324.

5048 Kusajima, H., Ooie, T., Kawahara, F. and Uchida, H.: High-performance liquid chromatographic determination of 6,8-difluoro-1-(2-fluoroethyl)-1,4-dihydro-7-(4-methyl-1-piperazinyl)-4-oxo-3-quinolinecarboxylic acid and its metabolites in laboratory animals. *J. Chromatogr.*, 381 (1986) 137-148.

5049 De Jong, J., Nielen, M.W.F., Frei, R.W. and Brinkman, U.A.T.: Selective on-line sample handling for the determination of barbiturates in urine by liquid chromatography with precolumn technology. *J. Chromatogr.*, 381 (1986) 431-437.

5050 McClanahan, J.S. and Maguire, J.H.: High-performance liquid chromatographic determination of the enantiomeric composition of urinary phenolic metabolites of phenytoin. *J. Chromatogr.*, 381 (1986) 438-446.

5051 Cummings, J., Morrison, J.G. and Willmott, N.: Determination of anthracycline purity in patient samples and identification of *in vitro* chemical reduction products by application of a multi-diode array high-speed spectrophotometric detector. *J. Chromatogr.*, 381 (1986) 373-384.

5052 Mullersman, G. and Derendorf, H.: Rapid analysis of ranitidine in biological fluids and determination of its erythrocyte partitioning. *J. Chromatogr.*, 381 (1986) 385-391.

5053 Miller, L.G. and Greenblatt, D.J.: Determination of atenolol in plasma by high-performance liquid chromatography with application to single-dose pharmacokinetics. *J. Chromatogr.*, 381 (1986) 201-204.

5054 Nielsen, H.: Use of enzymatic solubilization of tissues and direct injection on pre-columns of large volumes for analysing biological samples by high-performance liquid chromatography. *J. Chromatogr.*, 381 (1986) 63-74.

5055 Placidi, P.A.M., Aubert, C. and Cano, J.P.: Simultaneous determination of tropatezine and its major metabolites by high-performance liquid chromatographic-mass spectrometric identification. Application to metabolic and kinetic studies. *J. Chromatogr.*, 381 (1986) 75-82.

5056 Gifford, R., Randolph, W.C., Heineman, F.C. and Ziemniak, J.A.: Analysis of epinine and its metabolites in man after oral administration of its pro-drug ibopamine using high-performance liquid chromatography with electrochemical detection. *J. Chromatogr.*, 381 (1986) 83-93.

5057 Lygre, T., Aarsaether, N., Stensland, E., Aarsland, A. and Berge, R.K.: Separation and measurement of clofibroyl coenzyme A and clofibric acid in rat liver after clofibrate administration by reversed-phase high-performance liquid chromatography with photodiode array detection. *J. Chromatogr.*, 381 (1986) 95-105.

5058 Nicot, G., Lachatre, G., Gonnet, C., Mallon, J. and Mocaer, E.: Ion-pair extraction and high-performance liquid chromatographic determination of tianeptine and its metabolites in human plasma, urine and tissues. *J. Chromatogr.*, 381 (1986) 115-126.

5059 Canada, A., Wilson, J. and Calabrese, E.: Elimination kinetics of theophylline in the rabbit: effect of age and sex. *Drug Metab. Disp.*, 14 (1986) 372-374.

5060 Schillings, R.T. and Sisenwine, S.F.: Disposition of (5H-dibenzo[*a*,*b*]cyclohepten-5-ylidene)acetic acid in laboratory animals. *Drug Metab. Disp.*, 14 (1986) 405-412.

5061 Meacham, R.H., Jr., Sisenwine, S.F., Liu, A.L., Kick, C.J., Barinov, I. and Ruelius, H.W.: Inhibition of ciramadol glucuronidation by benzodiazepines. *Drug Metab. Disp.*, 14 (1986) 430-436.

5062 Young, R.A. and Mehendale, H.M.: *In vitro* metabolism of amiodarone by rabbit and rat liver and small intestine. *Drug Metab. Disp.*, 14 (1986) 423-429.

5063 Gerardy, B.M., Kapusta, D., Dumont, P. and Poupaert, J.H.: Sunthesis, characterization, and quantitation of *para*-hydroxymethadone, a metabolite of methadone in the rat. *Drug Metab. Disp.*, 14 (1986) 477-481.

5064 Chang, S.-L. and Levy, R.H.: Inhibitory effect of valproic acid on the disposition of carbamazepine and carbamazepine-10,11-epoxide in the rat. *Drug Metab. Disp.*, 14 (1986) 281-286.

5065 Hekman, P., Russel, F.G.M. and van Ginneken, C.A.M.: Renal transport of the glucuronides of paracetamol and *p*-nitrophenol in the dog. *Drug Metab. Disp.*, 14 (1986) 370-371.

5066 Hoffmann, K.-J.: Identification of the main urinary metabolites of omeprazole after an oral dose to rats and dogs. *Drug Metab. Disp.*, 14 (1986) 341-348.

5067 Hoffmann, K.-J., Renberg, L. and Olovson, S.-G.: Comparative metabolic disposition of ral doses of omeprazole in the dog, rat, and mouse. *Drug Metab. Disp.*, 14 (1986) 336-340.

5068 Loh, A.C., Williams, T.H., Tilley, J.W., Sasso, G.J., Szuna, A.J., Carbone, J.J., Toome, V. and Leinweber, F.-J.: The metabolism of ^{14}C-cibenzoline in dogs and rats. *Drug Metab. Disp.*, 14 (1986) 325-330.

5069 Hessey II., G.A., Constanzer, M.L. and Bayne, W.F.: Determination of chlorothiazide in urine using reversed-phase high-performance liquid chromatography with ultraviolet detection. *J. Chromatogr.*, 380 (1986) 450-454.

5070 Nguyen-Huu, J.J., Turk, P. and Diquet, B.: Determination of rubidazone and its metabolites in human plasma and urine by reversed-phase ion-pair high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 455-461.

5071 Uchino, K., Yamamura, Y., Saitoh, Y. and Nakagawa, F.: Determination of rhein and its conjugates in urine by high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 462-467.

5072 Hartley, R., Lucock, M., Cookman, J.R., Becker, M., Smith, I.J., Smithells, R.W. and Forsythe, W.I.: High-performance liquid chromatographic determination of carbamazepine and carbamazepine 10,11-epoxide in plasma and saliva following solid-phase sample extraction. *J. Chromatogr.*, 380 (1986) 347-356.

5073 Chan, K., Wong, C.L. and Lok, S.: High-performance liquid chromatographic determination of pyrazimanide in cerebrospinal fluid and plasma in the rabbit. *J. Chromatogr.*, 380 (1986) 367-373.

5074 Mineshita, S., Eggers, R., Kitteringham, N.R. and Ohnhaus, E.E.: Determination of phenacetin and its major metabolites in human plasma and urine by high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 407-413.

5075 Schwartz, M., Chiou, R., Stubbs, R.J. and Bayne, W.F.: Determination of diflunisal in human plasma and urine by fast high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 420-424.

5076 Ogunbona, F.A., Onyeji, C.O., Lawal, A.A., Chukwuani, C.M. and Bolaji, O.O.: Liquid chromatographic analysis of chloroquine and desethylchloroquine in human plasma, saliva and urine. *J. Chromatogr.*, 380 (1986) 425-430.

5077 Sugiyama, M., Ando, T., Okuyama, Y., Sugimoto, T. and Choukai, S.: Metabolism of 2,4-diamino-6-(2,5-dichlorophenyl)-s-triazine maleate in rats, guinea pigs, dogs and monkeys. *Arzneim.-Forsch.*, 36 (1986) 1229-1236.

5078 Hamadi, S.A., Cahng, S.-L. and Wedlund, P.J.: Quantitation of verapamil and norverapamil in small blood samples from the rat by high performance liquid chromatography. *Anal. Lett.*, 19 (1986) 1297-1310.

5079 Pang, K.S., Terrell, J.A., Nelson, S.D., Feuer, K.F., Clements, M.-J. and Endrenyi, L.: An enzyme-distributed system for lidocaine metabolism in the perfused rat liver preparation. *J. Pharmacokin. Biopharm.*, 14 (1986) 107-130.

5080 Proelss, H.F. and Townsend, T.B.: Simultaneous liquid-chromatographic determination of five antiarrhythmic drugs and their major active metabolites in serum. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1311-1317.

For additional information see:
C.A., 104 (1986) 179626z;
105 (1986) 17727b.

See also 4413, 4531, 4975.

32c. Drug monitoring

5081 Erttmann, R., Bielack, S. and Landbeck, G.: Determination of 7-hydroxy-methotrexate in human plasma by reversed-phase HPLC. *Oncology*, 43 (1986) 86-88; *C.A.*, 104 (1986) 199460u.

5082 Groeneveld, A.J.N. and Brouwers, J.R.B.J.: Quantitative determination of ofloxacin, ciprofloxacin, norfloxacin and perfloxacin in serum by high-pressure liquid chromatography. *Pharm. Weekbl., Sci. Ed.*, 8 (1986) 79; *C.A.*, 104 (1986) 199468c.

5083 Shih, M.L., Smith, J.R. and Ellin, R.I.: Determination of pyridostigmine in mammalian plasma: addressing current problems. *Anal. Lett.*, 19 (1986) 1137-1151.

5084 Schindler, J. and Hamilton, G.: (Cyclosporin A determination in whole blood and bile by RIA and HPLC). *Labor-Med.*, 9 (1986) 17-19; *C.A.*, 104 (1986) 218532n.

5085 Sloerdal, L., Prytz, P.S., Aaseboe, U. and Aarbakke, J.: A simple HPLC method for measuring metoclopramide in serum. *Acta Pharmacol. Toxicol.*, 58 (1986) 240-242; *C.A.*, 104 (1986) 218523k.

5086 Plomp, T.A., Boom, H.T. and Maes, R.A.A.: Measurement of flecainide plasma concentrations by HPLC with fluorescence detection. *J. Anal. Toxicol.*, 10 (1986) 102-106; *C.A.*, 105 (1986) 17812a.

5087 Dadgar, D. and Smyth, M.R.: Validation of chromatographic methods of analysis of drugs in biological samples. *TrAC*, 5 (1986) 115-117.

5088 Hughes, H., Hagen, L.E., Cameron, E.C. and Sutton, R.A.L.: Estimation of aluminoxamine and ferrioxamine in plasma by high-performance liquid chromatography. *Clin. Chim. Acta*, 157 (1986) 115-120.

5089 Miyazaki, S., Yokouchi, C., Nakamura, T-, Hashiguchi, N., Hou, W.-M. and Takada, M.: Pluronic F-127 gels as a novel vehicle for rectal administration of indomethacin. *Chem. Pharm. Bull.*, 34 (1986) 1801-1808.

5090 Scherbel, B., Dülffer, T. and Hägele, E.: Determination of antiepileptic drugs in serum with a HPLC column switching technique. *Fresenius' Z. Anal. Chem.*, 324 (1986) 326-327.

5091 Bechtel, W.D.: A simple procedure for direct and simultaneous determination of several neurotransmitters and their metabolites from various rat brain areas using HPLC with electrochemical detection. *Fresenius' Z. Anal. Chem.*, 324 (1986) 321-322.

5092 Wrenger, M., Oellerich, M., Raude, E. and Riedmann, M.: HPLC methods for therapeutic drug monitoring involving direct serum injection, column switching, and simple mobile phase adjustements. *Fresenius' Z. Anal. Chem.*, 324 (1986) 350-351.

5093 Abrahamsson, M.: Determination of prodrug of tranexamic acid in whole blood by reversed-phase liquid chromatography after pre-column derivatization with fluorescamine. *J. Pharm. Biomed. Anal.*, 4 (1986) 399-406.

5094 Maurer, K., Schmidt, H., Keller, H.E. and Sitzmann, F.C.: HPLC-method for the determination of cytarabin in plasma. *Fresenius' Z. Anal. Chem.*, 324 (1986) 329-330.
5095 Carrum, G., Abernethy, D.R., Sadhukhan, M. and Wright, III., C.E.: Minoxidil analysis in human plasma using high-performance liquid chromatography with electrochemical detection. Application to pharmacokinetics studies. *J. Chromatogr.*, 381 (1986) 127-135.
5096 Joulin, Y., Doare, L. and Diquet, B.: Micromethod for the determination of indalpine in mouse plasma using high-performance liquid chromatography with electrochemical detection. *J. Chromatogr.*, 381 (1986) 457-463.
5097 Hamamoto, K.: Rapid high-performance liquid chromatographic method for the determination of oxolinic acid in chicken plasma. *J. Chromatogr.*, 381 (1986) 453-456.
5098 Nicolas, P., Fauvelle, F. and Ennachachibi, A., Merdjan, H. and Petitjean, O.: Improved determination of sulpiride in plasma by ion-pair liquid chromatography with fluorescence detection. *J. Chromatogr.*, 381 (1986) 393-400.
5099 Bliss, M., Mayersohn, M. and Nolan, P.: High-performance liquid chromatographic analysis of amiodarone and desethylamiodarone of serum. *J. Chromatogr.*, 381 (1986) 179-184.
5100 Van der Horst, A., de Goede, P.N.F.C., Willems, H.J.J. and van Loenen, A.C.: Determination of desferoxamine and ferrioxamine by high-performance liquid chromatography with direct serum injection and pre-column enrichment. *J. Chromatogr.*, 381 (1986) 185-191.
5101 Ueno, K. and Umeda, T.: Determination of a new dihydropyridine derivative, methyl 3-cyclopentyl-4,7-dihydro-1,6-dimethyl-4-(3-nitrophenyl)pyrazolo[3,4-*b*] pyridine-5-carboxylate, in human serum by high-performance liquid chromatography with electrochemical detection and column switching. *J. Chromatogr.*, 381 (1986) 192-197.
5102 Miller, L.G. and Greenblatt, D.J.: Determination of albuterol in human plasma by high-performance liquid chromatography with fluorescence detection. *J. Chromatogr.*, 381 (1986) 205-208.
5103 Johansson, B.: Simplified quantitative determination of plasma phenytoin: on-line pre-column high-performance liquid immunoaffinity chromatography with sample pre-purification. *J. Chromatogr.*, 381 (1986) 107-113.
5104 Lam, S.: High-performance liquid chromatography of amiodarone and desethylamiodarone in serum after microscale protein precipitation. *J. Chromatogr.*, 381 (1986) 175-178.
5105 Rosex, R., Martinez, L., Pares, S., Sagarra, R. and Esteve, J.: Single and multiple dose pharmacokinetics of Sultosilic acid in humans. *Eur. J. Drug Metab.*, 11 (1986) 1-7.
5106 Avgerinos, A. and Hutt, A.J.: High-performance liquid chromatographic determination of ibuprofen in human plasma and urine by direct injection. *J. Chromatogr.*, 380 (1986) 468-471.
5107 Satonin, D.K. and Countant, J.E.: Comparison of gas chromatography and high-performance liquid chromatography for the analysis of probucol in plasma. *J. Chromatogr.*, 380 (1986) 401-406.
5108 Duncan, G.F., Farmen, R.H., Movahhed, H.S. and Pittman, K.A.: High-performance liquid chromatographic method for the determination of etoposide in plasma using electrochemical detection. *J. Chromatogr.*, 380 (1986) 357-365.
5109 Steyn, J.M., Hundt, H.K.L., van der Merwe, H.M., Salmon, J. and Mogilnicka, E.: High-performance liquid chromatographic method for the determination of sudexanox as the free acid in plasma. *J. Chromatogr.*, 380 (1986) 414-419.
5110 Grgurinovich, N.: Simple and sensitive method for the simultaneous determination of enprofylline, theobromine, paraxanthine, theophylline and caffeine using high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 431-436.
5111 Groppi, A., Papa, P., Montagna, M. and Carosi, G.: Determination of ornidazole in human plasma and red blood cells using high-performance liquid chromatography. *J. Chromatogr.*, 380 (1986) 437-442.
5112 Nieder, M. and Jaeger, H.: High-performance liquid chromatographic assay of flunarizine in plasma and its application to biopharmaceutic investigations. *J. Chromatogr.*, 380 (1986) 443-449.

5113 Annesley, T., Matz, K., Balogh, L., Clayton, L. and Giacherio, D.: Liquid-chromatographic analysis for cyclosporine with use of a microbore column and small sample volume. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1407-1409.

For additional information see:
C.A., 104 (1986) 199457y, 218512f, 218515j, 231018u;
105 (1986) 17752f.

32d. Toxicological applications

5114 Marc, van Damme, Molle, L. and Faouzi, A.D.: Useful sample handlings for reversed-phase HPLC in energency toxicology. *J. Toxicol., Clin. Toxicol.*, 23 (1986, Pub. 1985) 589-674; *C.A.*, 104 (1986) 201696w.
5115 Noggle, F.T., Jr., DeRuiter, J. and Clark, C.R.: Liquid chromatographic determination of the enantiomeric composition of methamphetamine prepared from ephedrine and pseudoephedrine. *Anal. Chem.*, 58 (1986) 1643-1648.

See also 4977.

32e. Plant extracts

5116 Itoh, H., Shinbori, Y. and Tamura, N.: Ion-chromatographic determination of valproic acid. *Bull. Chem. Soc. Jpn.*, 59 (1986) 230591p.
5117 Chiang, G.H.: HPLC analysis of capsaicins and simultaneous determination of capsaicins and piperine by HPLC-ECD and UV. *J. Food Sci.*, 51 (1986) 499-503; *C.A.*, 104 (1986) 205618v.
5118 Grunau, J.A. and Swiader, J.M.: Application of ion chromatography to anion analysis in vegetable leaf extracts. *Commun. Soil Sci. Plant Anal.*, 17 (1986) 321-335; *C.A.*, 104 (1986) 182663q.
5119 Huovinen, K., Hiltunen, R. and von Schantz, M.: A high performance liquid chromatographic method for the analysis of lichen compounds from the genera *Cladina* and *Cladonia*. *Acta Pharm. Fenn.*, 94 (1985) 99-112; *C.A.*, 104 (1986) 182651j.
5120 Toennesen, H.H. and Karlsen, J.: Studies on curcumin and curcuminoids. VII. Chromatographic separation and quantitative analysis of curcumin and related compounds. *Z. Lebensm.-Unters. Forsch.*, 182 (1986) 215-218; *C.A.*, 105 (1986) 2947z.
5121 Yamagishi, T.: (Analysis of biopharmaceuticals by high-performance liquid chromatography: analysis of *Angelica acutiloba* and *Cnidium officinale*). *Pharm. Tech. Jpn.*, 2 (1986) 167-173; *C.A.*, 104 (1986) 230541x.

For additional information see:
C.A., 104 (1986) 230552b;
105 (1986) 21171h.

See also 4529, 4530, 4700, 5155.

32f. Clinico-chemical applications and profiling body fluids

5122 Eastman, A.: Reevaluation of interaction of *cis*-dichloro(ethylenediamine) platinum(II) with DNA. *Biochemistry*, 25 (1986) 3912-3915.
5123 Wages, S.A. Church, W.H. and Justice, J.B., Jr.: Sampling considerations for on-line microbore liquid chromatography of brain dialysate. *Anal. Chem.*, 58 (1986) 1649-1656.
5124 Borner, K., Hartwig, H., Lode, H. and Höffken, G.: Chromatographische Bestimmung von Ofloxacin in Körperflüssigkeiten. *Fresenius' Z. Anal. Chem.*, 324 (1986) 355.
5125 Kraas, E. and Hirrle, A.: Determination of ofloxacin in biological fluids using HPLC with fluorometric detection. *Fresenius' Z. Anal. Chem.*, 324 (1986) 354.

5126 Bogart, B.I., Taylor, T., Lew, G., Gaerlan, P. A. and Denning, C.R.: High-performance liquid chromatographic fractionation and partial characterization of cystic fibrosis serum ultrafiltrates. *J. Chromatogr.*, 381 (1986) 29-40.

See also 4504, 4567, 4595, 4598, 4614, 4648, 4656, 4664, 4667, 4673, 4676, 4680, 4704, 4750 - 4752, 4755, 4822, 4892, 4904, 4919, 4924, 4925, 4927, 4928, 4931, 4947, 4950, 4956, 4960, 4985, 5003, 5018.

33. INORGANIC COMPOUNDS

33a. Cations

5127 Maiti, B. and Desai, S.R.: High-performance liquid chromatographic separation of beryllium, cobalt, nickel and chromium as the β-isopropyltropolone complexes and its application to the determination of chromium in air samples. *Analyst (London)*, 111 (1986) 809-811.

5128 Muchova, A. and Pikulikova, Z.: (Separation of metal ion mixtures in the system: strong acidic cation exchanger-chelating agents with phosphonic acid groups). *Chem. Pap.*, 40 (1986) 37-43; *C.A.*, 105 (1986) 17301h.

5129 Eusebius, L.C.T. and Khopkar, S.M.: Extraction chromatographic separation of gold using bis-(2-ethylhexyl)phosphoric acid as an extractant. *Indian J. Chem., Sect A*, 25A (1986) 300-301; *C.A.*, 105 (1986) 17307q.

5130 Firsova, L.A., Chuveleva, E.A. and Nazarov, P.P.: (Effect of ionizing radiation on rare earth chromatography using sodium nitrilotriacetate solutions of different concentrations). *Zh. Fiz. Khim.*, 60 (1986) 1020-1022; *C.A.*, 105 (1986) 34684c.

5131 Miller, T.F., Jr. and Iskandarani, Z.: Independent analysis of anions and cations using indirect photometric chromatography. *U.S. Pat.* US 4,567,753 (Cl. 73-61.1C; G01N31/04), 04 Feb. 1986, Appl. 682,032, 12 Dec. 1984; 14 pp.; *C.A.*, 105 (1986) 17472q.

5132 Baraniak, L. and Nebel, D.: Preparative scale separation of rare earths and transplutonium elements by high performance ion exchange chromatography. In: Xu, G. and Xiao, J. (Editors), *New Front. Rare Earth Sci. Appl., Proc. Int. Conf. Rare Earth Dev. Appl.*, Vol. 1, Sci. Press, Beijing, 1985, pp. 503-506; *C.A.*, 104 (1986) 235963w.

5133 Pitluck, M.R., Pollard, B.D. and Haworth, D.T.: Metal-ion adsorption determination for a series of SEC column. *LC Mag.*, 4 (1986) 115-120; *C.A.*, 104 (1986) 231228n.

5134 Ragimov, T.K., Yablochkin, A.V., Timoshin, V.I. and Petrov, A.M.: (Determination of americium-243 in highly radioactive solutions by extraction chromatography, isotope dilution and gamma-ray spectrometry). *Radiokhimiya*, 28 (1986) 276-278; *C.A.*, 105 (1986) 34789r.

5135 Grazhulene, S.S., Nagy, V.Yu., Orlova, T.A., Kireiko, V.V. and Telegin, G.F.: Extraction chromatography preconcentration of impurities from high purity lead. *Microchim. Acta*, 2 (1985) 153-160; *C.A.*, 104 (1986) 236341d.

5136 Tsukada, T., Saitoh, K. and Suzuki, N.: Molecular exclusion chromatography in studies of the vanadium- and nickel-containing species in residual oil. *Anal. Chim. Acta*, 183 (1986) 97-104.

5137 Strelow, F.W.E.: Separation of traces and minor amounts of lead from large amounts of zinc, indium, gallium, and other elements on a low cross-linked anion-exchange resin. *Anal. Chim. Acta*, 183 (1986) 307-311.

5138 Victor, A.H.: Separation of nickel from other elements by cation-exchange chromatography in dimethylglyoxime/hydrochloric acid/acetone media. *Anal. Chim. Acta*, 183 (1986) 155-161.

5139 Nakata, F., Hara, S., Matsuo, H., Kumamaru, T. and Matsushita, S.: Fractional determination of chromium(III) and chromium(IV) *via* ion chromatography with inductively coupled plasma atomic emission spectrometric detection. *Anal. Sci.*, 1 (1985) 157-160; *C.A.*, 104 (1986) 179206n.

5140 Matsumoto, A., Hirao, Y., Iwasaki, M., Fukuda, E., Hanami, H., Nara, S. and Kimura, K.: (Determination of lead in environmental samples by graphite furnace AAS). *Bunseki Kagaku*, 35 (1986) 590-597.

For additional information see:
C.A., 105 (1986) 17360b, 34716q.

See also 4942.

33b. Anions

5141 Vlacil, F. and Vins, I.: (Selection of chromatographic systems in ion chromatography. II.). *Chem. Listy*, 80 (1986) 302-319; *C.A.*, 105 (1986) 17208h - a review with 81 refs.
5142 Shpigun, O.A., Obrezkov, O.N. and Zolotov, Yu.A.: (Determination of perchlorate by ion chromatography). *Z. Anal. Khim.*, 41 (1986) 692-695; *C.A.*, 104 (1986) 236477c.
5143 Honma, H., Suzuki, K., Yoshida, M. and Yanashima, H.: (Simultaneous determination of fluorine, chlorine and bromine in organic compounds by combustion tube method-ion chromatography). *Bunseki Kagaku*, 35 (1986) 536-541.

For additonal information see:
C.A., 104 (1986) 236530q;
105 (1986) 17393q.

See also 5131.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

5144 Fedotov, S.N. and Yablochkin, A.V.: (Separation of americium and curium by extraction chromatography in the system of di-2-ethylhexyl orthophosphoric acid-nitric acid). *Radiokhimiya*, 28 (1986) 266-270; *C.A.*, 104 (1986) 231221e.
5145 Van Nieuwkerk, H.J., Das, H.A., Brinkman, U.A.T. and Frei, R.W.: On-line and low-level measurement of β-radiation in HPLC. *J. Radioanal. Nucl. Chem.*, 99 (1986) 423-433; *C.A.*, 105 (1986) 17532j.

See also 4462, 4519, 5130, 5132.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35a. Surfactants

5146 Zeman, I.: Application of bonded diol phases for separation of ethoxylated surfactants by high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 223-230.
5147 Holt, M.S., McKerrell, E.H., Perry, J. and Watkinson, R.J.: Determination of alkylphenol ethoxylates in environmental samples by high-performance liquid chromatography coupled to fluorescence detection. *J. Chromatogr.*, 362 (1986) 419-424.

See also 4577.

35b. Antioxidants and preservatives

5148 Gieger, U.: (Determination of residues of fungicide preservatives and antioxidants on fresh fruit by HPLC and automatic column control). *Lebensmittelchem. Gerichtl. Chem.*, 40 (1986) 25-28; *C.A.*, 104 (1986) 223696y.

5149 Baylocq, D., Majcherczyk, C. and Pellerin, F.: (Detection and determination of antioxidants in polyolefin-based plastic materials). *Ann. Pharm. Fr. 1985*, 43 (1986) 329-336; *C.A.*, 104 (1986) 230583n.

For additional information see:
C.A., 104 (1986) 184956m.

35c. Food analysis

5150 Ehlers, D.: (HPLC-determination of patulin in fruit juices-modified extraction and purification methods). *Lebensmittelchem. Gerichtl. Chem.*, 40 (1986) 2-4; *C.A.*, 104 (1986) 205605p.
5151 Masukawa, K., Komatsu, H., Fujimura, N., Fukuyama, T., Fukushima, M. and Ishikawa, T.: (Determination of hesperidin and its enzymatic hydrolysis products in Satsuma mandarin juice by HPLC). *Nippon Shokuhin Kogyo Gakkaishi*, 32 (1985) 864-869; *C.A.*, 104 (1986) 223697z.
5152 Calcagno, C., Evangelisti, F. and Zunin, P.: (Phenothiazine determination in honey samples by HPLC). *Riv. Soc. Ital. Sci. Aliment.*, 14 (1985) 441-446; *C.A.*, 104 (1986) 223704z.
5153 Ohlin, B.: A HPLC multiresidue method for determination of pesticides in fruits and vegetables. *Vaar Foeda*, 38 (Suppl. 2) (1986) 111-124; *C.A.*, 104 (1986) 223702x.
5154 Garcia-Regueiro, J.A., Hortos, M., Arnau, C. and Monfort, J.M.: Determination of skatole and indole in back fat of pigs by HPLC. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 362-363.
5155 Collinge, A., Hermesse, B. and Noirfalise, A.: (Study and determination by HPLC of glycyrrhizin in food products). *Belg. J. Food Chem. Biotechnol.*, 40 (1985) 143-145; *C.A.*, 105 (1986) 5268q.
5156 Woollard, D.C.: Expanding use of HPLC in food analysis. *Food Technol. N.Z.*, 21 (1986) 36-39, 55; *C.A.*, 105 (1986) 5219z.
5157 Yamamoto, A., Matsunaga, A. and Makino, M.: (Determination of food additives by photometric ion chromatography. II. Chlorite in candied foods). *Eisei Kogaku*, 31 (1985) 421-425; *C.A.*, 105 (1986) 5259n.
5158 Cilliers, J.J.L. and van Niekerk, P.J.: LC determination of phytic acid in food by postcolumn colorimetric detection. *J. Agric. Food Chem.*, 34 (1986) 680-683.
5159 Clark, C.M. and Crosby, N.T.: Analysis of veterinary residues in foods. *TrAC*, 5 (1986) 118-120 - a review with 13 refs.

See also 4515, 4516, 4596, 4606, 4634, 4907, 4943, 4965.

35d. Various technical products

For additional information see:
C.A., 104 (1986) 226211x, 227283j, 227406b, 227506j;
105 (1986) 26885d, 34883s.

See also 4621, 5136.

35e. Compounds with distinct biological activity and diverse chemical nature

See 4683.

36. CELLS AND CELLULAR PARTICLES

5160 Sancho, P., Delgado, M.D., Garcia-Perez, A.I. and Luque, J.: Fractionation of bone-marrow cells by counter-current distribution in aqueous polymer two-phase systems. Relation between settling time and the efficiency of separation. *J. Chromatogr.*, 380 (1986) 339-345.

5161 Poiree, J.C., Starita-Geribaldi, M. and Sudaka, P.: Separation and reconstitution of sodium-dependent glucose transport activity from renal brush-border membranes using gel-filtration chromatography. *Biochim. Biophys. Acta*, 858 (1986) 83-91.

For additional information see:
C.A., 104 (1986) 221664n, 221665p, 221666q.

37. ENVIRONMENTAL ANALYSIS

37a. General papers and reviews

See 4413.

37b. Air pollution

See 4647, 4935, 5127.

37c. Water pollution

5162 Senior, W., Chavelot, L. and Courtot, P.: (Determination of carbohydrates in the marine environment by HPLC). *J. Rech. Oceanogr.*, 10 (1985) 105-107; *C.A.*, 105 (1986) 17584c.

For additional information see:
C.A., 104 (1986) 230139x.

See also 4503, 4590, 4594, 4899, 4933, 4979, 5140.

37d. Soil pollution

5163 Kanatharana, P.: The column efficiency for the determination of paraquat residues in soil. *J. Environ. Sci. Health, Part A*, A21 (1986) 169-175; *C.A.*, 104 (1986) 220634r.

See also 5140.

Gas Chromatography

1. REVIEWS AND BOOKS

2402 Brondz, I. and Olsen, I.: Chemotaxonomy of selected species of the *Actinobacillus-Haemophilus-Pasteurella* group by means of gas chromatography, gas chromatography-mass spectrometry and bioenzymatic methods. *J. Chromatogr.*, 380 (1986) 1-17 - a review with 59 refs.
2403 Drugov, Yu.S. and Berezkin, V.G.: (Reaction-sorptive method of enrichment in gas chromatographic determination of impurities in air). *Usp. Khim.*, 55 (1986) 999-1022 - a review with 93 refs.
2404 Grob, K.: *Classical Split and Splitless Injection in Capillary GC.* Hüthig, Heidelberg, 1986.
2405 Grob, R.L.: *Modern Practice of Gas Chromatography. 2nd Edition.* Wiley-Interscience, N. York, 1985.
2406 Kirichenko, V.E. and Pashkevich, K.I.: (Gas-liquid chromatography of pesticide derivatives of phenylamide). *Zh. Anal. Khim.*, 41 (1986) 969-986 - a review with 133 refs.
2407 McDonald, R.S.: Review: Infrared spectrometry. *Anal. Chem.*, 58 (1986) 1906-1925 - a review with 10 refs. on GC-IR.
2408 Nikelly, J. (Editor): *Advances in Capillary Chromatography.* Hüthig, Heidelberg, 1986.
2409 Yanovskii, S.M.: (Use of chromadistillation for separation of large samples in gas chromatography for determination of impurities). *Usp. Khim.*, 55 (1986) 1162-1197 - a review with 131 refs.

See also 2447, 2467, 2502, 2506, 2606.

2. FUNDAMENTALS, THEORY AND GENERAL

2a. General

2410 Tamamushi, K. and Wilson, D.J.: Line shapes in gas chromatography. An improved numerical integration method. *Separ. Sci. Technol.*, 21 (1986) 339-351.

2b. Thermodynamics and theoretical relationships

2411 Kozloski, R.P.: Extrapolation and interpretation of gas chromatographic retention times. *Chromatographia*, 21 (1986) 397-401.
2412 Zolotarev, P.P. and Maksimycheva, M.A.: (Theory of chromatographic processes in a capillary column formed from two coaxial cylinders). *Zh. Fiz. Khim.*, 60 (1986) 381-385.

See also 2414, 2463, 2477.

2c. Relationship between structure and chromatographic behavior

2413 Fernandez Sanchez, E., Fernandez-Torres, A., Garcia-Dominguez, J.A., Molera, M.J., Garcia-Munoz, J. and Pertierra-Rimada, E.: The use of the retention of the methylene group to calculate specific retention volumes in gas chromatography. *An. Quim., Ser. A*, 81 (1985) 251-258; *C.A.*, 105 (1986) 49569t.
2414 Kiselev, A.V., Poshkus, D.P. and Shcherbakova, K.D.: (Chromatography and molecular structure). *Zh. Fiz. Khim.*, 60 (1986) 1329-1343.
2415 Vigdergauz, M.S. and Pakhomova, V.I.: (Use published retention indices for chromatographic identification of organic substances). *Zavod. Lab.*, 52, No. 7 (1986) 19-22.

See also 2515, 2552, 2556.

2d. Measurement of physico-chemical and related values

2416 Ashworth, A.J. and Letcher, T.M.: Mixed solvents in gas-liquid chromatography. Activity coefficients for acetone in squalane-dinonyl phtalate mixtures at 303 K. *J. Chromatogr.*, 362 (1986) 1-7.

2417 Cai Gencai: (On-line coupled simultaneous QDTA/T/EGA/GC technique. III. Screening of methanation catalysts and their poisoning by sulfur dioxide and regeneration). *Ranliao Huaxue Xuebao*, 13 (1985) 357-362; *C.A.*, 104 (1986) 151216s.

2418 Carrott, P.J.M. and Sing, K.S.W.: Gas chromatographic determination of heats of physisorption in micropores. *Chem. Ind. (London)*, (1986) 360-361; *C.A.*, 105 (1986) 12684a.

2419 Furio, D.L.: Physicochemical investigations of pure and blended solvents, and mesomorphic solvents. *Univ. Microfilms*, Order No. DA 8518942 (1985) 513 pp.; *C.A.*, 105 (1986) 17557w.

2420 Gavrilova, T.B., Kiselev, A.V., Parshina, I.V. and Roshchina, T.M.: (Adsorption properties of α-boron nitride). *Kolloidn. Zh.*, 48 (1986) 421-427; *C.A.*, 105 (1986) 34853g.

2421 Gidley, M.A. and Stubley, D.: Activity coefficients at infinite dilution of solutes in liquid-crystalline solvents. *J. Chem. Thermodyn.*, 18 (1986) 595-600; *C.A.*, 105 (1986) 49970s.

2422 Hirata, T.: A study of the reaction of CO or CO_2 with H_2 on $FeTi_{1.14}O_{9.03}$ by gas chromatography. *J. Mater. Sci. Lett.*, 5 (1986) 528-530; *C.A.*, 105 (1986) 12865k.

2423 Kiselev, A.V., Kovaleva, N.V., Kosheleva, L.S. and Titova, T.I.: (Adsorption properties of acetylenic carbon black modified with polyorganosiloxane liquids studied by gas chromatography and electron paramagnetic resonance spectroscopy). *Kolloidn. Zh.*, 48 (1986) 467-473; *C.A.*, 105 (1986) 34854h.

2424 Kozlov, V.A., Ivanov, A.N. and Erykalov, M.Yu.: (Gas-liquid chromatographic study of distribution of *m*- and *p*-disubstituted benzenes in a gas-liquid two-phase system). *Izv. Vyssh. Uchebn. Zaved., Khim. Khim. Tekhnol.*, 29, No. 1 (1986) 25-28; *C.A.*, 105 (1986) 42228x.

2425 Mowry, R.A., Jr.: Determining the calorific value of natural gas by using a silicon micromachined process gas chromatographic analyzer. *Anal. Instrum.*, 22 (1986) 13-26; *C.A.*, 105 (1986) 45923f.

2426 Shoji, K., Nakamura, Yu., Ueda, E. and Takeda, M.: (Studies on interaction between alkane and thermotropic liquid-crystalline polymer by gas chromatography). *Kobunshi Ronbunshu*, 43 (1986) 295-299; *C.A.*, 105 (1986) 43759h.

2427 Weidlich, U., Berg, J. and Gmehling, J.: Extension of UNIFAC by headspace gas chromatography. Part 2. *J. Chem. Eng. Data*, 31 (1986) 313-317; *C.A.*, 105 (1986) 49863j.

See also 2465, 2603.

3. GENERAL TECHNIQUES

3a. Apparatus and accessories

2428 Aranovich, G.L.: (Gas-liquid chromatographic analysis.) *U.S.S.R. Pat.* SU 1,221,595 (Cl. G01N30/02), 30 Mar. 1986, Appl. 3,720,051, 30 Mar. 1984; *C.A.*, 105 (1986) 17478w.

2429 Berezkin, V.G., Zakhodskii, L.V. and Khudyakov, V.L.: (Simple method for increasing the accuracy of measurement of the flow rate of a carrier gas). *Zavod. Lab.*, No. 4 (1986) 17-18.

2430 Boatman, R.J., Cunningham, S. and Ziegler, D.A.: A method for measuring the biodegradation of organic chemicals. *Environ. Toxicol. Chem.*, 5 (1986) 233-243; *C.A.*, 105 (1986) 1734r.

2431 Chen Yusen: (Modification of 102-G chromatograph for high-speed analysis). *Sepu*, 4, No. 1-2 (1986) 110-111; *C.A.*, 105 (1986) 17537q.

2432 Fisher, D.J.: Method and apparatus for analyzing gases dissolved in a liquid sample. *U.S. Pat.* US 4,587,834 (Cl. 73-23.1; G01N30/00), 13 May 1986, Appl. 709,253, 7 Mar. 1985; 9 pp.; *C.A.*, 105 (1986) 63524f.

2433 Gu Kanying and Wang Changshi: (A simple rapid method for sealing capillary columns). *Sepu*, 4, No. 1-2 (1986) 108, 69; *C.A.*, 105 (1986) 71813q.
2434 Hackett, J.P., Gibbon, G.A. and Feldman, J.: On-line gas chromatography for Fischer-Tropsch product characterization. *Anal. Instrum.*, 22 (1986) 27-42; *C.A.*, 105 (1986) 45943n.
2435 Hagiwara, S. and Takayama, Y.: (Silicon wafer for capillary gas chromatographic column). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,230,058 (85,230,058) (Cl. G01N30/60), 15 Nov. 1985, Appl. 84/85,796, 27 Apr. 1984; 4 pp.; *C.A.*, 105 (1986) 71872h.
2436 Marcu, M., Roman, G., Stiubianu, G. and Ilie, S.E.: (Silicone rubber compositions for gas chromatography septums). *Rom. Pat.* RO 88,122 (Cl. C08L83/04), 30 Oct. 1985, Appl. 112,341, 17 Oct. 1983; 2 pp.; *C.A.*, 105 (1986) 61971a.
2437 Monistere, M. and Giammanco, J.: A multiple analyzer, multiple host communication interface. *Anal. Instrum.*, 22 (1986) 103-106; *C.A.*, 105 (1986) 45448e.
2438 Schmid, R. and Wolf, C.: Construction of a new "closed on-column" injector for hot "on-column" injection in capillary gas chromatography. *Fresenius' Z. Anal. Chem.*, 324 (1986) 315-316.
2439 Schomburg, G. and Haeusig, U.: (Splitting and non-splitting sample handling with injection in capillary columns). *Ger. Offen. Pat.* DE 3,435,216 (Cl. G01N30/16), 3 Apr. 1986, Appl. 26 Sep. 1984; 16 pp.; *C.A.*, 105 (1986) 46158x.
2440 Staphanos, S.: Applications of capillary columns (FSOT columns) in one-line process gas chromatography. *Anal. Instrum.*, 22 (1986) 7-12; *C.A.*, 105 (1986) 45447d.
2441 Tanigawa, I. and Fujita, Y.: (Simultaneous generation of nitrogen and hydrogen). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,230,989 (85,230,989) (Cl. C25B1/00), 16 Nov. 1985, Appl. 84/87,508, 28 Apr. 1984; 4 pp.; *C.A.*, 105 (1986) 71776e.
2442 Thomas, L.R.: A GC sample system with automatic calibration using a liquid standard. *Anal. Instrum.*, 22 (1986) 63-67; *C.A.*, 105 (1986) 45324m.
2443 Valentin, J.R.: Multiplex gas chromatography for use in space craft. *Univ. Microfilm*, No. DA 8526745, 1985, 100 pp.; *C.A.*, 105 (1986) 71808s.
2444 Vinnikov, Yu.Ya., Dernenev, V.V. and Tamb'eva, N.S.: (Device for headspace analysis by means of chromatograph Tswett-100). *Zavod. Lab.*, 52, No. 6 (1986) 7-9.
2445 Zhang Hongtian: (Model QF-1 gas chromatograph for special use in ammonia synthesis). *Sepu*, 4, No. 1-2 (1986) 80-83; *C.A.*, 105 (1986) 34662u.

See also 2404, 2484, 2504, 2505, 2513, 2712.

3b. Detectors and detection reagents

2446 Knighton, IV., W.B.: Chemical and physical events affecting the quantitative response of the pulsed ^{63}Ni electron capture detector. *Univ. Microfilms*, Order No. DA 8507894, 1984, 155 pp.; *C.A.*, 104 (1986) 218174x.
2447 Koponen, J.: (Electrochemical detectors for chromatography. Part 2. Applications in gas chromatography). *KemKemi*, 13 (1986) 109-113; *C.A.*, 105 (1986) 17191x - a review with 43 refs.
2448 Zeng Yadi, Ou Qingyu, Qin Zhongcheng and Yu Weiluo: (Performance of photoionization detectors). *Sepu*, 4, No. 1-2 (1986) 117-119; *C.A.*, 105 (1986) 17571w.

See also 2486, 2491, 2510, 2514, 2530, 2553, 2716, 2732, 2736.

3c. Sorbents, carriers, column and layer performance, packing procedures

2449 Ares, M., Rodriguez, M.N. and Geczy, E.: (Use of addition products between polyoxyethylated fatty alcohols with isocyanates as stationary phase of multiple use in gas-liquid chromatography). *Rev. Cubana Quim.*, 1, No. 1 (1985) 79-85; *C.A.*, 105 (1986) 17554t.
2450 Barcelo-Culleres, D., Galceran-Huguet, M.T. and Eek-Vancelles, L.: (Liquid phases on solid supports for gas chromatography). *Butll. Soc. Catalana Cienc. Fis., Quim. Mat.*, 6 (1985) 263-283; *C.A.*, 105 (1986) 12695e.
2451 Buffham, B.A., Mason, G. and Meecham, R.I.: Sorption-effect chromatography. *J. Chromatogr. Sci.*, 24 (1986) 265-269.

2452 Chai Duanren, Zhang Zhiaiang, Shen Yaping and Ouyang Zheng: (Separation of chlorobenzoic acid by series-columns coated with ordinary stationary liquid and liquid crystal). *Sepu*, 4, No. 1-2 (1986) 60-62; *C.A.*, 105 (1986) 17569b.

2453 Dawidowicz, A.L. and Mendyk, E.: A study on the properties of chromatographic sorbents obtained by bonding alcohols to controlled porosity glasses. *Pol. J. Chem.*, 59, No. 7-9 (1985) 865-874; *C.A.*, 105 (1986) 17541m.

2454 Hagiwara, S. and Takayama, Y.: (Column substrate for capillary gas chromatography). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,230,056 (85,230,056) (Cl. G01N30/60), 15 Nov. 1985, Appl. 84/85,792, 27 Apr. 1984; 4 pp.; *C.A.*, 105 (1986) 71874k.

2455 Hagiwara, S. and Takayama, Y.: (Column substrate for a capillary gas chromatograph). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,230,057 (85,230,057) (Cl. G01N30/60), 15 Nov. 1985, Appl. 84/85,795, 27 Apr. 1984; 4 pp.; *C.A.*, 105 (1986) 71873j.

2456 Huang Xin Bu Aijin and Sun Yiliang: Static coating method for glass capillary columns at elevated temperatures. *J. Chromatogr.*, 362 (1986) 121-124.

2457 Kuai Naigong, Guo Shizhuo, Yang Xuezjong and Li Guozhen: (Synthesis and properties of high-temperature liquid crystals as stationary phase in gas-chromatography. III. Schiff bases liquid crystals of ethylene-4,4'-diaminodiphenylbis(*p*-alkoxybenzylidine). *Huandong Fangzhi Gongxueyuan Xuebao*, 12 (1986) 87-94; *C.A.*, 105 (1986) 70525k.

2458 Lipski, S.R. and Duffi, M.L.: High temperature gas chromatography: The development of new aluminium clad flexible fussed silica glass capillary columns coated with thermostable nonpolar phases. Part I. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 376-382.

2459 Lu Zufang and Li Guiqin: (Deactivation thermally stable SCOT column: preparation and evaluation of the column). *Sepu*, 4, No. 1-2 (1986) 1-5; *C.A.*, 105 (1986) 34848j.

2460 Melda, K.J. and Leaseburge, E.J.: Thick film capillaries and their application for process gas chromatography. *Anal. Instrum.*, 22 (1986) 1-6; *C.A.*, 105 (1986) 53824q.

2461 Naizhong, Z. and Green, L.E.: Multidimensional GC with macrobore WCOT and PLOT columns. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 400-404.

2462 Nawrocki, J.: How strongly do silanols interact with hydrocarbon solutes in gas chromatography? *J. Chromatogr.*, 362 (1986) 117-120.

2463 Ovechkin, I.A.: (Thermodynamic approach to evaluating the selectivity of individual and mixed liquid-crystal stationary phases in gas-liquid chromatography). *Izv. Vyssh. Uchebn. Zaved., Khim. Khim. Tekhnol.*, 29, No. 3 (1986) 115-117; *C.A.*, 105 (1986) 12683z.

2464 Paronyan, R.V., Eritsyan, M.L., Abgaryan, G.V., Vardanyan, L.S. and Dalalyan, N.Ya.: (Chromatographic analysis of organic substance mixtures). *U.S.S.R. Pat.* SU 1,206,697 (Cl. G01N30/48), 23 Jan. 1986, Appl. 3,705,555, 24 Feb. 1984; *C.A.*, 105 (1986) 17611j.

2465 Row Kyung Ho and Lee Won Kook: Separation of close-boiling components by gas-liquid chromatography. *J. Chem. Eng. Jpn.*, 19 (1986) 173-180; *C.A.*, 105 (1986) 45455e.

2466 Smith, J.L.: High speed gas chromatography using liquid crystalline stationary phases. *Univ. Microfilm*, Order No. DA 8600555 (1985) 202 pp.; *C.A.*, 105 (1986) 53859e.

2467 Sojak, L.: (Separation of isomeric hydrocarbons on liquid crystals used as stationary phases in gas-liquid chromatography). *Ropa Uhlie*, 28 (1986) 405-432 - a review with 34 refs.

2468 Welsch, T., Welsch, K., Vigh, G. and Engewald, W.: (Capillary-column gas chromatography with immobilized silicone phases.) *Wiss. Z.*, 35 (1986) 50-61; *C.A.*, 105 (1986) 34871m.

2469 Zakharov, A.P., Rastaturina, I.D. and Fedotova, V.M.: (Sorbent for gas-liquid chromatography). *U.S.S.R. Pat.* SU 1,226,306 (Cl. G01N30/48), 23 Apr. 1986, Appl. 3,403,072, 26 Feb. 1982; *C.A.*, 105 (1986) 34821v.

2470 Zhang Tieyuan and Zhang Shibin: (The intermediates of microparticulate silica gel bonded stationary phases - analysis of alkylchlorosilanes). *Beijing Shifan Daxue Xuebao, Ziran Kexueban*, No. 3 (1985) 61-64; *C.A.*, 105 (1986) 53876h.

See also 2412, 2416, 2501, 2508, 2511, 2543, 2558, 2607, 2654.

3d. Quantitative analysis

2471 Hangos, K. and Leisztner, L.: (Transformation of random error into systematic error by data reduction transformation). *Magy. Kem. Foly.*, 92 (1986) 282-286; *C.A.*, 105 (1986) 71613z.
2472 Ioffe, B.V., Kokovina, L.A. and Stolyarov, B.V.: (Quantitative headspace analysis in nonequilibrium systems). *Dokl. Akad. Nauk SSSR*, 286 (1986) 117-121.
2473 Kaiser, R.E. and Rieder, R.I.: Serie: Multi-Chromatographie VII. Probleme quantitativer Auswertungen in der Gas-Chromatographie: Änderung stoffspezifischer Korrekturfaktoren durch Änderung der Peakposition und -form. *LaborPraxis*, 10 (1986) 862-871.
2474 Olstowski, F.: Temperature programming in process gas chromatography. *Anal. Instrum.*, 22 (1986) 107-127; *C.A.*, 105 (1986) 45449f.
2475 Phillips, J.B.: Comments on imporvement of the limit of detection in chromatography by an integration method. *Anal. Chem.*, 58 (1986) 2091-2092.
2476 Synovec, R.E. and Yeung, E.S.: Comparison of an integration procedure to Fourier transform and data averaging procedures in chromatographic data analysis. *Anal. Chem.*, 58 (1986) 2093-2095.

See also 2514, 2530.

3f. Programmed temperature, pressure, vapors, gradients

2477 Podmaniczky, L., Szepesy, L., Lakszner, K. and Schomburg, G.: Determination of retention indices in LPTGC. *Chromatographia*, 21 (1986) 387-391.

See also 2473.

4. SPECIAL TECHNIQUES

4a. Automation and computerization

2478 Delaney, M.F.: Scientific literature management using Electronic Laboratory Notebook software. *Am. Lab. (Fairfield)*, 17, No. 7 (1986) 51-57 - useful for GC, too.
2479 Morita Y. and Yamagami, T.: (Applying a personal computer to measuring slow chemical reaction behaviors). *Kenkyu Hobun - Asahikawa Kogyo Koto Senmon Gakko*, 23 (1986) 83-91; *C.A.*, 105 (1986) 30801r.

See also 2437, 2643, 2712.

4b. Combination of various chromatographic techniques

See 2540, 2571, 2578, 2624, 2632, 2638, 2642, 2648, 2652, 2680, 2690, 2705.

4c. Combination with other physico-chemical techniques (MS, IR etc.)

2480 Abdulvakhobov, A., Sattarov, G. and Kist, A.A.: (Radioactivation determination of some noble metals in geological objects by the use of thermochromatography). *Radiokhimiya*, 28 (1986) 215-221; *C.A.*, 105 (1986) 71711e.
2481 Cody, R.B., Kinsinger, J.A., Ghaderi, S., Amster, I.J., McLafferty, F.W. and Brown, C.E.: Developments in analytical Fourier-transform mass spectrometry. *Anal. Chim. Acta*, 178 (1985) 43-66.
2482 Dmitriev, M.T., Rastyannikov, E.G. and Malysheva, A.G.: (Chromatographic-mass spectrometry of hair). *Lab. Delo*, No. 4 (1986) 223-226; *C.A.*, 105 (1986) 3047t.
2483 Fröhlich, O., Kahre, C. and Schreier, P.: GC-FTIR-MS for the analysis of volatiles. *Fresenius' Z. Anal. Chem.*, 324 (1986) 314.
2484 Matsumoto, K., Tsuge, S. and Hirata, Y.: Development of directly coupled supercritical fluid chromatography-mass spectrometry with self-spouting and vacuum nebulizing assisted interface. *Anal. Sci.*, 2 (1986) 3-7; *C.A.*, 105 (1986) 53837w.

2485 Murata, T. and Nakamura, J.: (Application of Shimadzu GCMS-QP 1000 gas chromatograph-mass spectrometer system to the analysis of high-boiling and high-mass number compounds). *Shimadzu Hyoron*, 42 (1985) 219-228; *C.A.*, 105 (1986) 53900m.

2486 Pepich, B.V., Callis, J.B., Danielson, J.D.S. and Gouterman, M.: Pulsed free jet expansion system for high-resolution fluorescence spectroscopy of capillary gas chromatographic effluents. *Rev. Sci. Instruments*, 57 (1986) 878-887; *C.A.*, 105 (1986) 34847h.

2487 Pivonka, D.E., Fateley, W.G. and Fry, R.C.: Simultaneous determination of carbon, hydrogen, nitrogen, oxygen, fluorine, chlorine, bromine and sulfur in gas chromatographic effluent by Fourier transform red/near-infrared atomic emission spectroscopy. *Appl. Spectrosc.*, 40 (1986) 291-297; *C.A.*, 105 (1986) 53834t.

2488 Shafer, K.H.: The hyphenation of chromatography and spectrometry. *Univ. Microfilms*, Order No. DA 8529026 (1985) 174 pp.; *C.A.*, 105 (1986) 34844e.

2489 Shimazu, K.: (Gas chromatograph-mass spectrometer). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,231,161 (85,231,161) (Cl. G01N27/62), 16 Nov. 1985, Appl. 84/87,362, 30 Apr. 1984; 3 pp.; *C.A.*, 105 (1986) 71875m.

2490 Wu Jia Cherng: Developments of GC-AA and HPLC-AA for metal speciation studies. *Univ. Microfilms*, Order No. DA 8526391 (1985) 281 pp.; *C.A.*, 105 (1986) 1762w.

2491 Zhou Yanru, Zhang Zongping and Hou Wenle: (Resolution of capillary gas chromatography-Fourier-transform IR in analysis). *Sepu*, 4, No. 1-2 (1986) 62-65; *C.A.*, 105 (1986) 71844a.

See also 2407, 2417, 2550, 2551, 2555, 2557, 2572, 2621, 2637, 2638, 2685, 2703, 2717, 2735.

4e. Functional analysis

2492 Valdez, D. and Iler, H.D.: Application of silylation to soaps, alcohols and amines in aqueous solutions. *J. Am. Oil Chem. Soc.*, 63 (1986) 119-122.

See also 2537.

4f. Trace analysis and preseparation techniques

2493 Booker, J.L. and Huang, V.: (Forensic applications of the static and dynamic collection and concentration of volatile organic compounds). *Fenxi Huaxue*, 13 (1985) 942-945; *C.A.*, 105 (1986) 36952n.

2494 Hawthorne, S.B. and Miller, D.J.: Extraction and recovery of organic pollutants from environmental solids and Tenax-GC using supercritical CO_2. *J. Chromatogr. Sci.*, 24 (1986) 258-264.

2495 Kolb, B., Liebhardt, B. and Ettre, L.S.: Cryofocusing on the combination of gas chromatography with equilibrium headspace sampling. *Chromatographia*, 21 (1986) 305-311.

2496 McElroy, F.F., Thompson, V.L., Holland, D.M., Lonneman, W.A. and Seila, R.L.: Cryogenic preconcentration-direct FID method for measurement of ambient NMOC: refinement and comparison with GC speciation. *J. Air Pollut. Control Assoc.*, 36 (1986) 710-714; *C.A.*, 105 (1986) 48101x.

2497 Rudling, J.: Simple model based on solubility parameters for liquid desorption of organic solvents adsorbed on activated carbon. *J. Chromatogr.*, 362 (1986) 175-185.

See also 2403, 2409, 2443, 2480, 2483, 2576, 2656, 2658, 2661, 2670, 2696, 2703, 2717.

4g. Separation of enantiomers

2498 Brooks, C.J.W. and Cole, W.J.: Analytical separation and characterisation of 1,2- and 1,3-diols as their cyclic ferroceneboronate derivatives. *J. Chromatogr.*, 362 (1986) 113-116.

2499 Facklam, C., Kortus, K. and Oehme, G.: (An N-acyl-group modified valinamide phase for gas chromatography in the enantiomeric separation of amino-acid derivatives). *Z. Chem.*, 25 (1985) 438-439; *C.A.*, 105 (1986) 71818v.

2500 König, W.A., Gyllenhaal, O. and Vessman, J.: Enantiomer separation of phenolic α- and β-recepted active drug by chiral capillary gas chromatography after derivatization with diazomethane and phosgene. *Fresenius' Z. Anal. Chem.*, 324 (1986) 325.

See also 2613.

4h. Other special techniques

2501 Caude, M. and Rosset, R.: Chromatographie en phase supercritique: colonnes capillaires ou colonnes remplies? *Analusis*, 14 (1986) 310-311.
2502 Chester, T.L.: The role of supercritical fluid chromatography in analytical chemistry. *J. Chromatogr. Sci.*, 24 (1986) 226-229 - a review with 15 refs.
2503 Ecknig, W. and Polster, H.-J.: Supercritical chromatography of paraffins on a molecular sieve: Analytical and preparative scale. *Separ. Sci. Technol.*, 21 (1986) 139-156.
2504 Fjeldsted, J.C.: Instrumentation for capillary supercritical fluid chromatography. *Univ. Microfilms*, Order No. DA 8516167, (1985) 376 pp.; *C.A.*, 105 (1986) 30554n.
2505 Guthrie, E.J. and Schwartz, H.E.: Integral pressure restrictor for capillary SFC. *J. Chromatogr. Sci.*, 24 (1986) 236-241.
2506 Lancas, F.M.: (Supercritical-fluid chromatography. Chromatography of the future). *Rev. Quim. Ind.*, 55 (1986) 9-11; *C.A.*, 105 (1986) 71800h - a review with 18 refs.
2507 Later, D.W., Richter, B.E., Knowles, D.E. and Andersen, M.R.: Analysis of various classes of drugs by capillary supercritical fluid chromatography. *J. Chromatogr. Sci.*, 24 (1986) 249-253.
2508 Levy, J.M. and Ritchey, W.M.: Investigation of the uses of modifiers in supercritical fluid chromatography. *J. Chromatogr. Sci.*, 24 (1986) 242-248.
2509 Markides, K.E., Fields, S.M. and Lee, M.L.: Capillary supercritical fluid chromatography of labile carboxylic acids. *J. Chromatogr. Sci.*, 24 (1986) 254-257.
2510 Pentoney, S.L., Jr., Shafer, K.H. and Griffiths, P.R.: A solvent elimination interface for capillary supercritical fluid chromatography/Fourtier transform infrared spectrometry using an infrared microscope. *J. Chromatogr. Sci.*, 24 (1986) 230-235.
2511 Schmitz, F.P.: Chromatography with sub- and supercritical eluents. Influence of the separation conditions on selectivity, plate number and resolution. *J. Chromatogr.*, 356 (1986) 261-269.
2512 Schwartz, H.E., Higgins, J.W. and Brownlee, R.G.: Simulated distillation of heavy petroleum fractions by capillary supercritical-fluid chromatography. *LC-GC*, 4 (1986) 639-643; *C.A.*, 105 (1986) 63312k.
2513 Smith, R.D., Fulton, J.L., Petersen, R.C., Kopriva, A.J. and Wright, B.W.: Performance of capillary restrictors in supercritical fluid chromatography. *Anal. Chem.*, 58 (1986) 2057-2064.

See also 2472, 2484, 2494, 2495.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5a. Aliphatic hydrocarbons

2514 Dierickx, J.L., Plehiers, P.M. and Froment, G.F.: On-line gas chromatographic analysis of hydrocarbon effluents. Calibration factors and their correlation. *J. Chromatogr.*, 362 (1986) 155-174.
2515 Kissin, Y.V.: Gas chromatographic analysis of branched olefins. *J. Chromatogr. Sci.*, 24 (1986) 278-284.

See also 2503, 2643, 2678, 2702, 2713.

5b. Cyclic hydrocarbons

2516 Agarwal, R., Kumar, S. and Mehrotra, N.K.: Polyaromatic hydrocarbon profile of a mineral oil (JBO-P) by gas chromatography. *J. Chromatogr. Sci.*, 24 (1986) 289-292.

See also 2632, 2698.

5c. Halogen derivatives

2517 Jin Xiufen: (Gas chromatographic analysis for chlorotoluene isomers in their synthesis mixtures). *Sepu*, 4, No. 1-2 (1986) 123-124; *C.A.*, 105 (1986) 53853y.

See also 2424, 2685, 2711, 2725.

5d. Complex hydrocarbon mixtures

See 2723.

6. ALCOHOLS

2518 Chiarotti, M., De Giovanni, N. and Offidani, C.: Selection of a suitable internal standard in headspace gas chromatographic breath ethanol analysis after adsorption in silica gel. *Blutalkohol*, 23 (1986) 138-142; *C.A.*, 105 (1986) 1748y.

2519 Sisfontes, L., Nyborg, G., Jones, A.W. and Blomstrand, R.: Occurrence of short-chain aliphatic diols in human blood: identification by gas chromatography-mass spectrometry. *Clin. Chim. Acta*, 155 (1986) 117-122.

2520 Werkhoff, P. and Bretschneider, W.: (Gas chromatographic determination of diethylene glycol in wine, grape huice and grape juice concentrates). *Z. Lebensm.-Unters. Forsch.*, 182 (1986) 298-302; *C.A.*, 105 (1986) 5038q.

See also 2492, 2498, 2534, 2635, 2674, 2677, 2691, 2709, 2720, 2721.

7. PHENOLS

See 2665, 2715, 2735.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

8a. Flavonoids

See 2630.

8b. Aflatoxins and other mycotoxins

2521 Martin, P.J., Stahr, H.M., Hyde, W. and Domoto, M.: Chromatography of trichothecene mycotoxins. *J. Liquid Chromatogr.*, 9 (1986) 1591-1602.

9. OXO COMPOUNDS, ETHERS AND EPOXIDES

2522 Vrabel, M.: (Determination of diethyl ether in aqueous solutions by gas chromatography). *Farm. Obz.*, 55 (1986) 269-274; *C.A.*, 105 (1986) 66549d.

See also 2691, 2720.

10. CARBOHYDRATES

10a. Mono and oligosaccharides. Structural studies

2523 El'kin, Yu.N. and Surits, V.B.: (Identification of sugars as O-methyl oxime acetates by mass spectrometry). *Bioorg. Khim.*, 12 (1986) 391-398; *C.A.*, 105 (1986) 71853c.

2524 Englmaier, P.: Identification and quantitative estimation of plant cyclitols and polyols by gas chromatography. *Fresenius' Z. Anal. Chem.*, 324 (1986) 338-339.

2525 Li Tielin and Wu Changxian: (Gas chromatographic determination of saccharides and alditols. III. Improvements in the determination of O-trimethylsilyl derivatives of sugar oximes). *Fenxi Huaxue*, 13 (1985) 908-912; *C.A.*, 105 (1986) 71847d.

10b. Polysaccharides, mucopolysaccharides, lipopolysaccharides

2526 Meier, D. and Weissmann, G.: (Methanolysis of acidic xylo-oligosaccharides and GC/MS of silylated cleavage products). *Holzforschung*, 40 (1986) 55-57; *C.A.*, 105 (1986) 45016n.

2527 Van Langenhove, A. and Reinhold, V.: Determination of polysaccharide linkage and branching by reductive depolymerization. Gas-liquid chromatography and gas-liquid chromatography-mass spectrometry reference data. *Carbohydr. Res.*, 143 (1985) 1-20; *C.A.*, 105 (1986) 24522j.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

2528 Kawashiro, K., Morimoto, S. and Yoshida, H.: Gas chromatography-mass spectrometry of N-trifluoroacetyl trimethylsilyl esters of some iminodicarboxylic acids. *Bull. Chem. Soc. Jpn.*, 58 (1985) 2727-2728; *C.A.*, 105 (1986) 42125m.

2529 Lee Kuo Chen: (Determination of volatile fatty acids and lactic acid in silage). *Chung-kuo Nung Yeh Hua Hsueh Hui Chih*, 24 (1986) 80-85; *C.A.*, 105 (1986) 23196u.

See also 2509, 2637, 2645, 2648, 2650, 2671, 2686, 2693, 2716.

11c. Lipids and their constituents

2530 Bannon, C.D., Craske, J.D. and Hilliker, A.E.: Analysis of fatty acid methyl esters with high accuracy and reliability. V. Validation of theoretical relative response factors of unsaturated esters in the flame ionization detector. *J. Am. Oil Chem. Soc.*, 63 (1986) 105-110.

2531 Bjoerkman, C. and Forslund, K.: Volatile fatty acids in adult and young ruminants; an evaluation of a chromatographic method. *J. Dairy Sci.*, 69 (1986) 998-1003; *C.A.*, 105 (1986) 38494p.

2532 Graille, J., Pina, M. and Pioch, D.: Routine analysis of jojoba wax fatty acids and alcohols by single column capillary GC. *J. Am. Oil Chem. Soc.*, 63 (1986) 111-116.

2533 Maltby, D.A. and Millington, D.S.: Analysis of volatile free fatty acids in human urine by capillary column gas chromatography/mass spectrometry. *Clin. Chim. Acta*, 155 (1986) 167-172.

2534 Oborn, R.E. and Ullman, A.H.: A capillary gas chromatographic method for the characterization of linear fatty alcohols. *J. Am. Oil Chem. Soc.*, 63 (1986) 95-97.

2535 Rezanka, T. and Podojil, M.: Identification of wax esters of the fresh-water green alga *Chlorella Kessleri* by gas chromatography-mass spectrometry. *J. Chromatogr.*, 362 (1986) 399-406.

2536 Tobioka, H. and Kato, M.: (Methods of sample preparation for determination of volatile fatty acids in rumen fluid). *Kyushu Tokai Daigaku Nogakubu Kiyo*, 5 (1986) 77-82; *C.A.*, 105 (1986) 57271e.

2537 Van Kuijk, F.J.G.M., Thomas, D.W., Konopelski, J.P. and Dratz, E.A.: Trans-esterification of phospholipids or triglycerides to fatty acid benzyl esters with simultaneous methylation of free fatty acids for gas-liquid chromatographic analysis. *J. Lipid. Res.*, 27 (1986) 452-456; *C.A.*, 105 (1986) 57239a.

See also 2492, 2642, 2646, 2681, 2683, 2707, 2709.

13. STEROIDS

13a. Pregnane and androstane derivatives

2538 Akiyama, T., Hashino, M., Kawamura, E., Kosaki, T., Yanaihara, T., Nakayama, T. and Mori, H.: (Determination of serum 16α-hydroxydehydroepiandrosterone, 16α-hydroxyestrone and estriol by gas chromatography-mass spectrometry and their perinatal movement). *Nippon Sanka Fujinka Gakkai Zasshi*, 38 (1986) 505-512; *C.A.*, 105 (1986) 54691f.

2539 Gould, V.J., Turkes, A.O. and Gaskell, S.J.: Gas chromatography-mass spectrometric analysis of salivary testosterone with reference to diethylstilbestrol--treated prostatic cancer patients. *J. Steroid Biochem.*, 24 (1986) 563-567; *C.A.*, 105 (1986) 763n.

2540 Moretti, G., Boniforti, L., Secco, F., Amici, M., Cammarata, P. and Innocenti, R.: (Studies on diethylstilbestrol residues in bovine feces using HPTLC and GC-MS. *Ann. Ist. Super. Sanita*, 21 (1985) 391-400; *C.A.*, 105 (1986) 23159j.

2541 Nikulicheva, S.I., Trubnikov, V.I., Kotova, I.A., Volovel'skii, L.N., Sokolov, S.D., Sapozhnikov, Yu.M. and Makarenko, P.N.: (Gas-liquid chromatography for the analysis of androstane derivatives). *Farmatsiya (Moscow)*, 35, No. 2 (1986) 18-19; *C.A.*, 105 (1986) 12223z.

See also 2619.

13c. Sterols

See 2683.

13d. Bile acids and alcohols

2542 Nakashima, T., Hasegawa, T., Sano, A., Nakagawa, Y., Seto, Y., Nakamjima, T., Okuno, T. and Takino, T.: (GC/MS gas chromatography/mass spectrometry analyses of unusual bile acids in the urine of rifampionin-treated patients). *Iyo Masu Kenkyukai Koenshu*, 10 (1985) 185-188; *C.A.*, 104 (1986) 179781w.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

15a. Terpenes

2543 Koscielski, T., Sybilska, D., Belniak, S. and Jurczak, J.: Application of a gas-liquid chromatography system with *n*-cyclodextrin for monitoring the stereochemical course of β-pinene hydrogenation. *Chromatographia*, 21 (1986) 413-416.

2544 Vorob'eva, N.S., Zemskova, Z.K., Pekhk, T.I. and Petrov, A.A.: (Diterpenoid tetracyclic hydrocarbons in petroleum). *Neftekhimiya*, 26 (1986) 291-297.

15b. Essential oils

2545 Chen Gang, Cai Minghong and Zong Xiufeng: (Quantitative determination of safrole by gas chromatography). *Sepu*, 4, No. 1-2 (1986) 68-69; *C.A.*, 105 (1986) 29772a.

2546 Chen Shuzhen: (Determination of cis and trans isomers of anethole from star aniseed oil by combined gas chromatography-mass spectrometry). *Sepu*, 4, No. 1-2 (1986) 120, 111; *C.A.*, 105 (1986) 41413s.

2547 Cotroneo, A., Verzera, A., Alfa, M. and Dugo, G.: (Purity of citrus essential oils. Note XI. Determination of the total amount of carbonyl compounds ("citral") in lemon essential oils). *Riv. Soc. Ital. Sci. Aliment.*, 14 (1985) 447-452; *C.A.*, 105 (1986) 48804d.

2548 Gao Shiyan and Zheng Hongjun: (Determination of the main constituents of the essential oils from the peels and immature fruits of citrus by gas chromatography (GC)). *Yaoyu Fenxi Zazhi*, 6 (1986) 83-85; *C.A.*, 105 (1986) 49127x.

2549 Lapikova, L.S., Morozova, V.I. and Bakhtinov, A.A.: (Standard procedure for gas chromatographic analysis of perfume linalool). *Maslo-Zhir. Prom-st.*, No. 4 (1986) 22-23; *C.A.*, 105 (1986) 48814g.

2550 Mazza, G.: Etude sur la composition aromatique de l'huile essentielle de bergamote (*Citrus aurantium* subsp. *bergamia* Risso et Poiteau Engler) par chromatographie gazeuse et spectrometrie de masse. *J. Chromatogr.*, 362 (1986) 87-99.

2551 Vernin, G., Metzger, J., Fraisse, D. and Scharff, C.: GC-MS (EI, PCI, NCI) computer analysis of volatile sulfur compounds in garlic essential oils. Application of the mass fragmentometry SIM technique. *Planta Med.*, No. 2 (1986) 96-101; *C.A.*, 105 (1986) 48808h.

16. NITRO AND NITROSO COMPOUNDS

2552 Robbat, A., Jr., Corso, N.P., Doherty, P.J. and Marshall, D.: Multivariate relationships between gas chromatographic retention index and molecular connectivity of mononitrated polycyclic aromatic hydrocarbons. *Anal. Chem.*, 58 (1986) 2072-2077.

2553 Robbat, A., Jr., Corso, N.P., Doherty, P.J. and Wolf, M.H.: Gas chromatographic chemiluminiscent detection and evaluation of predictive models for identifying nitrated polycyclic aromatic hydrocarbons in a Diesel fuel particulate extract. *Anal. Chem.*, 58 (1986) 2078-2084.

2554 Spanedda, L., Melis, M. and Roni, C.: Separation of nitromusks by capillary gas chromatography. *J. Chromatogr.*, 362 (1986) 278-280.

2555 Thompson, H.C., Jr., Billedeau, S.M. and Miller, B.J.: Gas chromatographic thermal energy analysis method for N-nitrosodibutylamine in latex infant pacifiers: collaborative study. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 504-507.

See also 2424.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

17a. Amines and polyamines

See 2492, 2714, 2722.

17c. Amine derivatives and amides (excluding peptides)

2556 Oszczapowicz, J., Ciszkowski, K. and Osek, J.: Amidines. XXVI. Retention indices of N^1,N^1-dimethylpropionamidines, isobutyramidines, pivalamidines and phenylacetamidines on a non-polar column. *J. Chromatogr.*, 362 (1986) 383-389- retention data for 92 amidines.

See also 2663.

18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

18a. Amino acids and their derivatives

2557 Hayashi, T., Minatogawa, Y., Kamada, S., Shimamura, M., Naruse, H. and Iida, Y.: Sensitive determination of deuterated phenylalanine and tyrosine in human plasma by combined capillary gas chromatography- negative ion chemical ionization mass spectrometry. *J. Chromatogr.*, 380 (1986) 239-245.

2558 Moodie, I.M., Shephard, G.S. and Labadarios, D.: Gas-liquid chromatography of amino acids with Supelcoport as solid support. *J. Chromatogr.*, 362 (1986) 407-412.

See also 2499.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

2559 Buhlert, J.: (A method to determine thyrostatics through gas chromatography). *Dtsch. Lebensm.-Rundsch.*, 82 (1986) 146-148; *C.A.*, 105 (1986) 59520j.
2560 Ishida, H., Sekine, H., Kimura, S. and Sekiya, S.: (Gas chromatographic determination of theobromine in foods). *Shokuhin Eiseigaku Zasshi*, 27 (1986) 75-80; *C.A.*, 105 (1986) 23155e.

See also 2625.

22. ALKALOIDS

2561 Ylinen, M., Naaranlahti, T., Lipinjoki, S., Huhtikangas, A., Salonen, M.L., Simola, L.K. and Lounasmaa, M.: Tropane alkaloids from *Atropa belladonna*; Part I. Capillary gas chromatographic analysis. *Planta Med.*, (1986) 85-87; *C.A.*, 105 (1986) 49138b.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23d. Pyridine derivatives

See 2620.

23e. Other N-heterocyclic compounds

See 2641, 2672, 2719.

24. ORGANIC SULPHUR COMPOUNDS

2562 Hovorka, J. and Vsetecka, J.: (Determination of toluene sulphoamides and ditolylsulphones by gas chromatography). *Chem. Prum.*, 36 (1986) 316-318.
2563 Itoh, H., Yano, M., Okada, N. and Nikkuni, S.: Volatile isothiocyanate detected in the cultivar of *Brassica* vegetable. Part 2. Analysis of flavor of cabbage by gas chromatography-mass spectrometry. *Shokuhin Sogo Kenkyusho Kenkyu Hokoku*, No. 47 (1985) 41-48; *C.A.*, 105 (1986) 41467n.

See also 2551, 2639, 2644, 2654, 2656, 2658.

25. ORGANIC PHOSPHORUS COMPOUNDS

2564 Abraham, S.J. and Criddle, W.J.: Anion effects in the pyrolysis-gas chromatography of quaternary phosphonium compounds. *J. Anal. Appl. Pyrolysis*, 9 (1986) 65-74; *C.A.*, 105 (1986) 6007r.

See also 2665.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26a. Organometallic compounds

2565 Stel'makh, V.P., Pozdeev, V.V. and Pomeshchikov, V.S.: (Analysis of products from direct radiation-chemical synthesis of dibutyldibromotin). *Zavod. Lab.*, 52 No. 6 (1986) 17.

2566 Zhang Xie, Qi Jiziang, Zhong Guolun and Niu Fenlan: (Determination of organomercury in sediments with the combined gas chromatography-mercury analyzer). *Huanjing Huaxue*, 5 (1986) 20-25; *C.A.*, 105 (1986) 29637k.

2567 Zuo Yuegang and Pang Shuwei: (Determination of dialkylmercury compounds by reaction gas chromatography). *Fenxi Huaxue*, 13 (1985) 890-895; *C.A.*, 105 (1986) 17605k.

See also 2717, 2732, 2736.

26b. Boranes, silanes and related non-metallic compounds

See 2470.

26c. Coordination compounds

See 2490.

27. VITAMINS AND VARIOUS GROWTH REGULATORS (NON-PEPTIDIC)

2568 Amegah, R.: The application of inverse gas chromatography to beta-carotene oxidation. *Univ. Microfilms*, Order No. DA 8520333 (1985) 154 pp.; *C.A.*, 105 (1986) 41363a.

2569 Hunter, W.J.: High-performance gas chromatographic method for the estimation of the indole-3-acetic acid content of plant materials. *J. Chromatogr.*, 362 (1986) 430-435.

2570 Velisek, J. and Davidek, J.: Gas-liquid chromatography of vitamins in foods: the water-soluble vitamins. *J. Micronutr. Anal.*, 2 (1986) 25-42; *C.A.*, 105 (1986) 23135y.

See also 2669.

28. ANTIBIOTICS

2571 Takatsuki, K., Suzuki, S. and Ushizawa, I.: Liquid chromatographic determination of monensin in chicken tissues with fluorometric detection and confirmation by gas chromatography-mass spectrometry. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 443-448.

29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS

29a. Chlorinated insecticides

2572 Alford-Stevens, A.L., Bellar, T.A., Eichelberger, J.W. and Budde, W.L.: Accuracy and precision of determination of chlorinated pesticides and polychlorinated biphenyls with automated interpretation of mass spectrometric data. *Anal. Chem.*, 58 (1986) 2022-2029.

2573 Atuma, S.S., Jensen, S., Mowrer, J. and Orn, U.: Separation of lipophilic substances in environmental samples with special reference to toxaphene. *Int. J. Environ. Anal. Chem.*, 24 (1986) 213-225.

2574 Fukushima, M. and Yamamoto, T.: (Multi-residue analysis for organochlorine compounds by capillary GC/MS (gas chromatography-mass spectrometry). *Seikatsu Eisei*, 30 (1986) 19-29; *C.A.*, 105 (1986) 71798p.
2575 LeBel, G.L. and Williams, D.T.: Determination of halogenated contaminants in human adipose tissue. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 451-458.
2576 Reeve, V., Jeffery, J., Weihs, D. and Jennings, W.: Developments in arson analysis: a comparison of charcoal adsorption and direct headspace injection techniques using fused silica capillary gas chromatography. *J. Forensic Sci.*, 31 (1986) 479-488; *C.A.*, 105 (1986) 55811g.
2577 Seymour, M.P., Jefferies, T.M. and Notarianni, L.J.: An analysis of PCBs and organochlorine pesticides by capillary gas chromatography - a modern approach to PCB/OCP residue analysis of human milk. *Anal. Proc.*, 23 (1986) 260-261.
2578 Sun Weixiang: (Separation and purification of organochlorine pesticide residues in lipoids using high-performance liquid chromatography). *Fenxi Huaxue*, 14 (1986) 122-124; *C.A.*, 105 (1986) 36914b.
2579 Turman, K.W., Erickson, M.D., Boone, P.J., Flora, J.D., Jr. and Heggem, D.T.: Effect of oil matrix on PCB quantification. *Bull. Environ. Contam. Toxicol.*, 37 (1986) 10-17; *C.A.*, 105 (1986) 56193u.
2580 Wu Bohua and Liu Shuren: (Gas chromatographic determination of 666 and DDT). *Sepu*, 4, No. 1-2 (1986) 122-123; *C.A.*, 105 (1986) 5265m.
2581 Yang Guoliang, Wang Qinjian, Tao Lianfa and Chen Xi: (Separation of organochlorine agrochemicals with the PEG 1000-CBP gas chromatographic column). *Sepu*, 4, No. 1-2 (1986) 125; *C.A.*, 105 (1986) 20338f.

See also 2680, 2684, 2685, 2724, 2727.

29b. Phosphorus insecticides

2582 Betker, W.R.: Gas chromatographic determination of fensulfothion in formulations: colaborative study. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 488-490.
2583 Fukuhara, K., Matsuki, Y. and Nambara, T.: (Determination of dephosphate-bromophenophos excreted in cow's milk by gas-liquid chromatoraphy using an electron capture detector). *Shokuhin Eisegaku Zasshi*, 26 (1985) 658-661; *C.A.*, 105 (1986) 23156f.

See also 2680, 2684, 2731.

29c. Carbamates

2584 Baldi, M., Bovolenta, A., Penazzi, L., Pederzini, C., Buriani, S. and Pocaterra, F.: (GLC-ECD determination of α-naphthaleneacetic and β-naphthoxyacetic acids after derivatization with pentafluorobenzyl bromide and confirmation by HRGC-MS-EI). *Ind. Conserve*, 60 (1985) 304-309; *C.A.*, 105 (1986) 23160c.
2585 Bondarev, V.S., Talalakina, T.N., Spiridonov, Yu.Ya., Shestakov, V.G. and Raskin, M.S.: (Gas chromatographic determination of sangor in water, soil and plants). *Khim. Sel'sk. Khoz.*, No. 5 (1986) 68-69; *C.A.*, 105 (1986) 56191s.

See also 2730.

29d. Herbicides

2586 Janos, E., Cserhati, T., Bordas, B. and Dobrovolszky, A.: Lipophilicity of triazine herbicides measured by gas chromatography. *Acta Phytopathol. Acad. Sci. Hung.*, 20 (1985) 219-224; *C.A.*, 105 (1986) 2089w.

29e. Fungicides

See 2616, 2733, 2734.

29f. Other types of pesticides and various agrochemicals

See 2406.

31. PLASTICS AND THEIR INTERMEDIATES

2587 Barashkov, O.K. and Barshtein, R.S.: (Determination of the solubility parameters of poly(vinyl chloride) plasticizers by inverse gas chromatography). *Vysokomol. Soedin., Ser. B*, 28 (1986) 214-216; *C.A.*, 105 (1986) 61397t.

2588 Castells, R.C., Mazza, G.D. and Arancibia, E.L.: (Gas chromatography study of polymer-solvent interactions. Systems formed by hydrocarbons and alcohols with poly(vinyl acetate)). *An. Asoc. Quim. Argent.*, 73 (1985) 519-530; *C.A.*, 105 (1986) 7151v.

2589 Chekhuta, O.M. and Zhilkina, L.I.: (Chromatographic control in continuous production of light epoxy-diane resins. Analysis of organic phase). *Zavod. Lab.*, 52, No. 6 (1986) 14-15.

2590 Demertzis, P.G. and Kontominas, M.G.: Interaction of vinyl chloride with poly(vinyl chloride) by inverse gas chromatography: effect of monomer concentration, plasticizer content and temperature. *Dev. Food Sci.*, 12 (1986) 513-523; *C.A.*, 105 (1986) 7266m.

2591 De Rudder, D., de Graeve, E., van Severen, R. and Braeckman, P.: Quantification of ethylene chlorohydrin and ethylene glycol as potential reaction products in gas-sterilized medical-grade plastics. *J. Clin. Hosp. Pharm.*, 11 (1986) 125-130; *C.A.*, 105 (1986) 49013g.

2592 Goetz, N., Lasserre, P. and Kaba, G.: Characterization and identification of synthetic high polymers using pyrolysis-gas chromatography. *Cosmet. Sci. Technol. Ser.*, 4 (1985) 81-103; *C.A.*, 104 (1986) 174331q.

2593 Hayashi, H. and Matsuzawa, Sh.: Gas chromatographic determination of acid-catalyzed transesterified anioxidant additive Irganox 1076 in polypropylene. *J. Appl. Polym. Sci.*, 31 (1986) 1709-1719; *C.A.*, 105 (1986) 7320z.

2594 Joffrion, L.L. and Glover, C.J.: Vapor-liquid equilibrium of the ternary *n*-heptane/isopropyl alcohol/atactic polypropylene mixture from perturbation gas chromatography. *Macromolecules*, 19 (1986) 1710-1718; *C.A.*, 105 (1986) 24959g.

2595 Kalman, D.A.: Survey analysis of volatile organics released from plastics under thermal stress. *Am. Ind. Hyg. Assoc. J.*, 47 (1986) 270-275; *C.A.*, 105 (1986) 48075s.

2596 Liu Minzhen: (Determination of the composition of α-SAN resin by pyrolytic gas chromatography). *Shiyou Huagong*, 14 (1985) 285-288; *C.A.*, 105 (1986) 7115m.

2597 Liu Yicai: (Application of head-space gas chromatographic determination of ethyl methyl terephthalate in polypropylene). *Shiyou Huangong*, 14 (1985) 680-683; *C.A.*, 105 (1986) 7116n.

2598 Ohtani, H., Kimura, T. and Tsuge, S.: Analysis of thermal degradation of terephthalate polyesters by high-resolution pyrolysis-gas chromatography. *Anal. Sci.*, 2 (1986) 179-182; *C.A.*, 105 (1986) 25047v.

2599 Shoji, K. and Takeda, M.: (Studies on the phase diagram of a lyotropic liquid-crystalline polymer by gas chromatography). *Kobunshi Ronbunshu*, 43 (1986) 243-245; *C.A.*, 105 (1986) 24890c.

2600 Smith, S.R., Krenceski, M.A., Hubball, J., Erickson, E.D. and Johnson, J.H.: The determination of solvents in polymers by a simple direct GC/MS method. *J. Adhes.*, 18 (1985) 157-165; *C.A.*, 105 (1986) 24987q.

2601 Sourisseau, R., Mueller, W. and Sourisseau, R.: (Gas chromatographic investigation of the structure of industrial butadiene-styrene copolymers). *Plaste Kautsch.*, 33 (1986) 61-63; *C.A.*, 105 (1986) 7718k.

2602 Vimalasiri, P.A.D.T., Haken, J.K. and Burford, R.P.: Gas chromatographic analysis of cross-linked polyester-based polyurethane foams containing tri- and tetrafunctional alcohols after alkali fusion. *J. Chromatogr.*, 362 (1986) 391-397.

2603 Voznyakovskii, A.P., Genkin, A.N. and Petrova, N.A.: (Study of a block copolymer-modifying additive-sorbate system by reversed gas chromatography). *Zh. Fiz. Khim.*, 60 (1986) 686-689.

2604 Zhou Yanru, Zhang Zhongping and Wu Jingjia: (Identification of pyrolysis products of polybutadienes with the Curie-Point pyrolysis capillary gas chromatograph and Fourier transform infrared system). *Sepu*, 4, No. 1-2 (1986) 85-88; *C.A.*, 105 (1986) 7122m.

See also 2436, 2664, 2665, 2694, 2701.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. Synthetic drugs

2605 Brandenberger, H.: Neue Wege in der Pharmaka- und Drogenanalytik. *Fresenius' Z. Anal. Chem.*, 324 (1986) 233-234.

2606 Calvo, M.B., Pedraz, J.L. and Dominguez-Gil, A.: (Drug derivatization for gas chromatographic analysis). *Cienc. Ind. Farm.*, 5 (1986) 131-135; *C.A.*, 105 (1986) 53936c - a review with 35 refs.

2607 Dzhabarov, D.N., Ivanova, T.V., Lenchik, N.V. and Rudenko, B.A.: (Use of metal solid carriers in gas chromatographic separation of pharmaceuticals). *Zh. Anal. Khim.*, 41 (1986) 307-312.

2608 Evtushenko, M.S.: (Determination and standardization of Validol dosage forms). *Farm. Zh. (Kiev)*, No. 2 (1986) 51-56; *C.A.*, 105 (1986) 49160c.

2609 Lauko, A. and Gorog, S.: (Analysis of pyridinol carbamate. Part 1. Gas chromatographic determination of pyridinol carbamate). *Acta Pharm. Hung.*, 56 (1986) 129-132; *C.A.*, 105 (1986) 49174k.

2610 Nixon, A., Mallet, A.I., Jackman, P.J.H. and Gower, D.B.: Testosterone metabolism by isolated human axillary *Corynebacterium* spp.: a gas-chromatographic mass-spectrometric study. *J. Steroid Biochem.*, 24 (1986) 887-892; *C.A.*, 105 (1986) 3290s.

2611 Shardinov, V.N.: (Gas chromatography of the derivatives of pyridinecarboxylic acids based on the products of their pyrolysis). *Khim.-Farm. Zh.*, 20 (1986) 221-224; *C.A.*, 105 (1986) 12214x.

2612 Utezhanov, K.S. and Starchevskii, M.K.: (Gas chromatographic determination of cyclodol). *Farm. Zh. (Kiev)*, No. 2 (1986) 56-58; *C.A.*, 105 (1986) 30171k.

See also 2500, 2507, 2541, 2562.

32b. Pharmacokinetic studies

2613 Singh, N.N., Jamali, F., Pasutto, F.M., Russell, A.S., Coutts, R.T. and Drader, K.S.: Pharmacokinetics of the enantiomers of thiaprofenic acid in humans. *J. Pharm. Sci.*, 75 (1986) 439-442.

32c. Drug monitoring

2614 Dadgar, D. and Smyth, M.R.: Validation of chromatographic method of analysis of drugs in biological samples. *TrAC*, 5 (1986) 115-117.

2615 Ervik, M., Kylberg-Hanssen, K. and Johansson, L.: Determination of metoprolol in plasma and urine using high-resolution gas chromatography and electron-capture detection. *J. Chromatogr.*, 381 (1986) 168-174.

2616 Hamada, T., Kadowaki, M., Nakamura, Y. and Awata, N.: Determination of the antiallergic agent KB-2413 in plasma by means of capillary gas chromatography with a nitrogen-sensitive detector. *Chem. Pharm. Bull.*, 34 (1986) 1168-1171; *C.A.*, 105 (1986) 35007w.

2617 Holland, M.L., Uetz, J.A. and Ng, K.T.: Capillary gas chromatographic assay with nitrogen-phosphorus detection for trans-6-(2-chlorophenyl)-1,2,3,5,6,10b-hexahydropyrrolo-(2,1-a)isoquinoline hydrobromide, a new antidepressant drug, in plasma. *J. Chromatogr.*, 380 (1986) 151-156.

2618 Karawya, M.S., Khayyal, S.E., Farrag, N.M. and Ayad, M.M.: Screening of diphenylamine as an antihyperglycemic agent in certain edible plant organs. *Acta Pharm. Hung.*, 56 (1986) 55-58; *C.A.*, 105 (1986) 12202s.

2619 Leith, H.M. and Truran, P.L.: Quantification of progesterone in human saliva. *Biomed. Environ. Mass Spectrom.*, 13 (1986) 257-261; *C.A.*, 105 (1986) 18650h.

2620 Lutz, D., Llias, E. and Jaeger, H.: Automated determination of nifedipine in human plasma by capillary gas chromatography with electron capture detection. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 397-399.

2621 Nakajima, K., Kotaki, H., Saitoh, Y. and Nakagawa, F.: Determination of methylphenidate and its main metabolite in plasma by gas chromatography-chemical ionization mass spectrometry. *Chem. Pharm. Bull.*, 34 (1986) 1701-1708; *C.A.*, 105 (1986) 35012u.

2622 Nazarali, A.J., Baker, G.B. and Boisvert, D.P.: Analysis of clonidine in biological tissues and body fluids by gas chromatography with electron-capture detection. *J. Chromatogr.*, 280 (1986) 393-400.

2623 Phillips, M. and Greenberg, J.: Measurement of breath carbon disulfide during disulfiram therapy by gas chromatography with flame photometric detection. *J. Chromatogr.*, 381 (1986) 164-167.

2624 Satonin, D.K. and Coutant, J.E.: Comparison of gas chromatography and high-performance liquid chromatography for the analysis of probucol in plasma. *J. Chromatogr.*, 380 (1986) 401-406.

2625 Stavchansky, S., Combs, A. and Delgado, M.: Gas-liquid chromatographic determination of coffeine in breast milk and blood plasma. *Anal. Lett.*, 19 (1986) 639-648.

2626 Stefek, M., Benes, L. and Kovacik, V.: Identification of *in vitro* rat metabolites of pentacaine, a carbanilate local anesthetic, by gas chromatography/mass spectrometry. *Biomed. Environ. Mass Spectrom.*, 13 (1986) 193-198; *C.A.*, 105 (1986) 17771m.

2627 Syracuse, C.D., Kuhnert, B.R., Kaine, C.J., Santos, A.C. and Finster, M.: Measurement of midazolam and α-hydroxymidazolam by gas chromatography with electron-capture detection. *J. Chromatogr.*, 380 (1986) 145-150.

2628 Theis, D.L., Halstead, G.W. and Halm, K.A.: Development of capillary gas chromatographic-mass spectrometric methodology for the simultaneous determination of ibuprofen and (ar-$^2H_4$) ibuprofen in serum: demonstration of kinetic equivalence in the beagle. *J. Chromatogr.*, 380 (1986) 77-87.

2629 Wan Weihua and Li Hanling: (Rapid determination of diazepam in human saliva). *Yaowu Fenxi Zazhi*, 6 (1986) 85-87; *C.A.*, 105 (1986) 100u.

2630 Yamamoto, K., Kato, S. and Shimomura, H.: Gas chromatographic-mass spectrometric analysis of monodemethylated metabolites of 6,7- and 7,8-dimethoxycoumarin isomers. *J. Chromatogr.*, 362 (1986) 274-277.

See also 2559.

32d. Toxicological applications

2631 Angerer, J.: Umweltgifte in Körper und Ihre Erfassung. *Fresenius' Z. Anal. Chem.*, 324 (1986) 232-233.

2632 Colin, P., Sirois, G. and Chakrabarti, S.: Determination of styrene in biological samples by reversed-phase liquid chromatography. *J. Chromatogr.*, 375 (1986) 431-437.

2633 Esin, M.S. and Vigdergauz, M.S.: (Correlations between toxicity indexes and chromatographic characteristics of chemical substances). *Gig. Sanit.*, No. 5 (1986) 61-62; *C.A.*, 105 (1986) 55759w.

2634 Geldmacher-von Mallinckrodt, M.: Die Analytik von Pesticiden und Pesticid-Rückständen im Körper. *Fresenius' Z. Anal. Chem.*, 324 (1986) 231-232.

2635 Kolarska, A., Benchev, I. and Rizov, N.: (Determination of volatile toxic substances in biological products in gas chromatography - head space analysis. I. Determination of alcohol in urine). *Khig. Zdraveopaz.*, 29, No. 2 (1986) 75-78; *C.A.*, 105 (1986) 55802e.

2636 Okamoto, I., Chikasue, F., Miyazaki, T., Yashiki, M. and Kojima, T.: (Extrelut column extraction for screening of drugs in biological materials by gas chromatography and gas chromatography-mass spectrometry. A fatal poisoning by ingestion of a drug containing acetaminophen, ethenzamide and bromvalerylurea). *Nippon Hoigaku Zasshi*, 39 (1985) 386-391; *C.A.*, 105 (1986) 19955y.

2637 Pettit, B.R.: The analysis of thiodiglycollic acid by selected ion monitoring. *Clin. Chim. Acta*, 156 (1986) 85-90.

2638 Verebey, K., Mule, S.J., Alrazi, J. and Lehrer, M.: One hundred emit positive cannabinoid urine samples confirmed by BPA/TLC, RIA, and GC/MS. *J. Anal. Toxicol.*, 10 (1986) 79-80; *C.A.*, 104 (1986) 181226n.

2639 Zhang Runian, Lu Peikun, Bao Zhanggang and Shen Xinyu: (Gas chromatographic determination of the urinary vinyl chloride metabolite thiodiglycolic acid). *Zhonghua Laodong Weisheng Zhiyebing Zazhi*, 3 (1985) 355-357; *C.A.*, 105 (1986) 29126t.

See also 2493, 2518, 2519, 2573, 2575, 2576, 2577, 2583, 2718.

32e. Plant extracts

2640 Adesina, S.K. and Akinwusi, D.D.: New constituets of *Zanthoxylum tessmannii* (Eng.) ayafor root. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 412-414.

2641 Belikov, V.G., Kudrin, S.A. and Kompantseva, E.V.: (Determination cytisine in the grass *Thermopsis alterniflora* by gas-liquid chromatography). *Khim. Prir. Soedin.*, No. 1 (1986) 118; *C.A.*, 105 (1986) 2953y.

32f. Clinico-chemical applications and profiling body fluids

2642 Beaumelle, B.D. and Vial, H.J.: Total cholesterol, fatty acids, and plasmalogens can be reliably quantitated by analysis on chromarods after the methylation step required for fatty acid analysis by gas-liquid chromatography. *Anal. Biochem.*, 155 (1986) 346-351.

2643 Brill, J.H., Mar, T., Mayfield, H.T. and Bertsch, W.: Application of computer-based pattern recognition procedures in the study of biological samples. Comparison of the cuticular hydrocarbon profiles of different colonies of the black imported fire ant. *Analyst (London)*, 111 (1986) 711-716.

2644 Chikamoto, T. and Maitani, T.: Gas chromatographic determination of thiocyanate ion in biological fluids using immobilized phase-transfer catalyst for derivatization. *Anal. Sci.*, 2 (1986) 161-164; *C.A.*, 105 (1986) 21156g.

2645 Hsiao Kwang Jen, Hung Su Hwi, Wu Shew Jen and Yeh Sheau Farn: Gas chromatographic analysis of abnormal urinary organic acids in phenylketonuria. *T'ai-wan I Hsueh Hui Tsa Chih*, 84 (1985) 1240-1250; *C.A.*, 105 (1986) 21151b.

2646 Kuksis, A., Myher, J.J., Marai, L., Little, J.A., McArthur, R.G. and Roncari, D.A.K.: Usefulness of gas chromatographic profiles of plasma total lipids in diagnosis of phytosterolemia. *J. Chromatogr.*, 381 (1986) 1-12.

2647 Mio, T., Inoue, M. and Sumino, K.: (GC/MS gas chromatography/mass spectrometry analysis of urinary metabolites of opeprim in a cushing's syndrome patient). *Iyo Masu Kenkyukai Koenshu*, 10 (1985) 91-94; *C.A.*, 104 (1986) 179660f.

2648 Muro, H. and Tatsuhara, T.: (Effect of valproic acid metabolites on immunoassay). *Igaku no Ayumi*, 135 (1985) 413-414; *C.A.*, 105 (1986) 71k.

2649 Okudzhava, V.M., Chankvetadze, B.G., Antadze, Z.I., Rukhadze, M.D. and Vetrogon, F.G.: (Quantitative determination of sodium valproate by gas-liquid chromatography). *Soobshch. Akad. Nauk Gruz. SSR*, 121 (1986) 557-559; *C.A.*, 105 (1986) 17745f.

2650 Schatowitz, B. and Gercken, G.: Gas-chromatographic determination of carboxylic acids in serum as benzyl esters. *Fresenius' Z. Anal. Chem.*, 324 (1986) 331-333 - retention data of 47 acids.

See also 2542.

33. INORGANIC COMPOUNDS

33b. Anions

2651 Hanika, G.: (Trimethylchlorosilane method for the gas chromatographic determination of fluoride). *Z. Gesamte Hyg. Ihre Grenzgeb.*, 32 (1986) 151-153; *C.A.*, 105 (1986) 34742v.

2652 Kishima, N.: Simultaneous determination of molecular hydrogen, sulfide, and sulfate in solution samples from experimental hydrothermal systems. *Anal. Chem.*, 58 (1986) 1255-1258.

33c. Permanent and rare gases

2653 Minon, G. and Masschelein, W.J.: (Direct method for determination of dissolved nitrogen). *Sci. Eau*, 5 (1986) 169-184; *C.A.*, 105 (1986) 48701t.

See also 2661.

33d. Volatile inorganic compounds

2654 Barinaga, C.J. and Farwell, S.O.: Putative ester effects on the cryogenic FSOT capillary chromatography of sulfur-containing gases. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 388-391.
2655 Barsky, J.B., Hee, S.S.Q., Clark, S. and Trapp, J.H.: Simultaneous multi-instrumental monitoring of vapors in sewer headspaces by several direct-reading instruments. *Environ. Res.*, 39 (1986) 307-320.
2656 Berezkin, V.G., Pryakhina, V.M., Boiko, A.I., Shcherbina, A.A. and Novotorova, L.G.: (Reaction-chromatographic determination of sulfur microimpurities in titanium(IV)chloride). *Zavod. Lab.*, 52, No. 6 (1986) 11-14.
2657 Chen Shusheng and Wang Jianxin: (Determination of inorganic iodine by gas chromatography). *Sepu*, 4, No. 1-2 (1986) 66-67; *C.A.*, 105 (1986) 17408y.
2658 Deprez, P.P., Franzmann, P.D. and Burton, H.R.: Determination of reduced sulfur gases in antarctic lakes and seawater by gas chromatography after solid adsorbent preconcentration. *J. Chromatogr.*, 362 (1986) 9-21.
2659 He Luqing, Huang Yixia, Cao Lei and Gao Guangjin: (Determination of micro-amounts of elemental sulfur in antimony by gas chromatography). *Fenxi Huaxue*, 14 (1986) 139-141; *C.A.*, 105 (1986) 34755b.
2660 Muto, N., Okada, S., Kane, K., Yamauchi, A., Nakamura, A. and Asazuma, T.: (Uses of headspace analysis. (2). Hydrogen sulfide from sewage treatment facility). *Akushu No Kenkyu*, 14, No. 64 (1985) 9-17; *C.A.*, 104 (1986) 155514k.
2661 Nemets, V.M., Solovev, A.A. and Funtov, V.N.: (Isotopic-chromatographic-atomic-emission determination of carbon dioxide in helium using adsorption preconcentration). *Zh. Anal. Khim.*, 41 (1986) 1054-1060.
2662 Nie Tiezheng, Li Xiumei, Lu Sidong and Wang Qinghua: (Determination of trace hydrogen sulfide in synthetic ammonia raw gases). *Sepu*, 4, No. 1-2 (1986) 109-110; *C.A.*, 105 (1986) 53705b.

See also 2430, 2445, 2623, 2712.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

See 2557, 2628.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35a. Surfactants

2663 Suzuki, S., Sakai, M., Ikeda, K., Mori, K., Amemiya, T. and Watanabe, Y.: Analysis of alkyltrimethyl- and dialkyldimethylammonium compounds by gas chromatography. *J. Chromatogr.*, 362 (1986) 227-234.

35b. Antioxidants and preservatives

2664 Cwiek, K., Mazur, H. and Berger, S.: (Determination of butylated hydroxy-toluene (BHT) migration from polystyrene and polypropylene into model fluids by the method of gas chromatography). *Roczn. Panstw. Zakl. Hig.*, 36 (1985) 406-410; *C.A.*, 105 (1986) 23176n.
2665 Petko, M.-and Bystricky, L.: GLC and HPLC method for direct determination of the content of phenol and free alkylphenols in the polymer additives of the type of phosphoric acid aryl esters. *Chem. Papers*, 40 (1986) 357-362.
2666 Tokarska, B., Hawrysh, Z.J. and Clandinin, M.T.: Study of the effect of antioxidants on storage stability of canola oil using gas liquid chromatography. *Can. Inst. Food Sci. Technol. J.*, 19 (1986) 130-133; *C.A.*, 105 (1986) 59648g.

35c. Food analysis

2667 Aishima, T.: Application of multivariate analysis to silica capillary GC profiles to differentiate the aroma characteristics of Worcestshire sauces. *Dev. Food Sci.*, 12 (1986) 755-774; *C.A.*, 105 (1986) 59586k.

2668 Apostolopoulos, D.V.: Inverse gas chromatography as used in studying water sorption of coffee solubles. *Univ. Microfilms*, Order No. DA 8520334 (1985) 399 pp.; *C.A.*, 105 (1986) 41384h.

2669 Echols, R.E., Miller, R.H. and Foster, W.: Analysis of thiamine in milk by gas chromatography and nitrogen-phosphorus detector. *J. Dairy Sci.*, 69 (1986) 1246-1249; *C.A.*, 105 (1986) 59511g.

2670 Etievant, P., Maarse, H. and van den Berg, F.: Wine analysis: Study and comparison of techniques developed for the study of volatile constituents. *Chromatographia*, 21 (1986) 379-386.

2671 Gilsbach, W.: (Gas chromatographic determination of monohaloacetic acids in beer and wine-containing drinks). *Dtsch. Lebensm.-Rundsch.*, 82 (1986) 107-111; *C.A.*, 105 (1986) 22965g.

2672 Grimmer, G. and Naujack, K.-W.: Gas chromatographic profile analysis of basic nitrogen-containing aromatic compounds (azaarenes) in high protein foods. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 537-541.

2673 Guentert, M., Rapp, A., Takeoka, G. and Jennings, W.: HRGC and HRGC-MS applied to wine constituents of lower volatility. *Z. Lebensm.-Unters. Forsch.*, 182 (1986) 200-204; *C.A.*, 104 (1986) 223516q.

2674 Hollingworth, T.A., Jr., Throm, H.R., Wekell, M.M., Trager, W.F. and O'Donnell, M.W., Jr.: Head space gas chromatographic method for determination of ethanol in canned salmon: collaborative study. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 524-526.

2675 Iwai, T., Wada, K., Takemura, A., Takayama, K. and Ninomiya, T.: (Determination of loxoprofen sodium in animal feed by capillary column-gas chromatography). *Sankyo Kenkyusho Nempo*, 37 (1985) 113-120; *C.A.*, 105 (1986) 5234a.

2676 Kasahara, K., Funakoshi, J. and Nishibori, K.: (Identification of volatile components of roasted laver by GC-MS (gas chromatography-mass spectrometry). *Nippon Suisan Gakkaishi*, 52 (1986) 751-754; *C.A.*, 105 (1986) 41474n.

2677 Li Yuanqian and Zeng Yongchang: (Gas chromatographic analysis for methanol and fusel oil in potable spirits). *Huaxi Yike Daxue Xuebao*, 17 (1986) 41-44; *C.A.*, 105 (1986) 22958g.

2678 Lusky, K., Stoyke, M., Bauch, J., Gentzsch, G., Ackermann, H. and Martin, S.: (Examination on the quantitative determination of hydrocarbons in the boiling range of *n*-hexane in vegetable oil and animal fatty tissue). *Arch. Lebensmittelhyg.*, 37 (1986) 48-50; *C.A.*, 105 (1986) 59518q.

2679 Minarova, E., Kurucova, M. and Kovac, J.: (Determination of trimorphamide residues in hops). *Agrochemia (Bratislava)*, 26 (1986) 139-140; *C.A.*, 105 (1986) 59388x.

2680 Onji, Y., Uno, M., Nagami, H., Ueda, N. and Ueda, Y.: (Food contaminants monitored by GC/MS. II. Droplet counter-current chromatographic fractionation for food contamination monitoring by GC/MS). *Shokuhin Eiseigaku Zasshi*, 26 (1985) 662-665; *C.A.*, 105 (1986) 5248h.

2681 Scher, A.: Identitätsprüfung und Qualitätskontrolle von Fetten. *Fresenius' Z. Anal. Chem.*, 324 (1986) 215-216.

2682 Shishikura, A., Fujimoto, K., Kaneda, T., Arai, K. and Saito, S.: Modification of butter oil by extraction with supercritical carbon dioxide. *Agric. Biol. Chem.*, 50 (1986) 1209-1215; *C.A.*, 105 (1986) 23291w.

2683 Stack, J.B., Joe, F.L., Jr., Cunningham, D.G., Fazio, T. and Roach, J.A.G.: Gas chromatographic determination of fatty acids and sterols in orange juice. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 551-559.

2684 Vogelgesang, J. and Thier, H.P.: (Contributions to the analysis of pesticide residues in ready-to-eat foods). *Z. Lebensm.-Unters. Forsch.*, 182 (1986) 400-406; *C.A.*, 105 (1986) 41360x.

See also 2520, 2529, 2563, 2570, 2584, 2666.

35d. Various technical products

2685 Alford-Stevens, A.L., Bellar, T.A., Eichelberger, J.W. and Budde, W.L.: Characterization of commercial Aroclors by automated mass spectrometric determination of polychlorinated biphenyls by level of chlorination. *Anal. Chem.*, 58 (1986) 2014-2022.

2686 Amer, A., Alley, E.G. and Pittman, C.U.: Development of a successful gas chromatographic method of analyzing *o*-aminobenzenesulfonic acids *via* their sulfonyl chlorides. *J. Chromatogr.*, 362 (1986) 413-418.

2687 Berezkin, V.G. and Drugov, Yu.S.: (Reaction-chromatographic identification of thermal degradation products of cooling oil fluids). *Zavod. Lab.*, 52, No. 7 (1986) 16-19.

2688 Bertoni, G., Liberti, A., Agostinone, C.B., D'Antonio, M., Pettinari, L. and Leoni, V.: Identification by gas chromatography-mass spectrometry of the products obtained from thermal decomposition of azinphosmethyl (guthion). *Ann. Chim. (Rome)*, 76 (1986) 19-28; *C.A.*, 105 (1986) 2222j.

2689 Jackson, H.W., Mirmira, C.K. and Wagner, W.M.: Oxidative oil stability using volatiles methodology. *J. Am. Oil Chem. Soc.*, 63 (1986) 117-118.

2690 Kholostova, G.G., Bakunin, V.N. and Shimonaev, G.S.: (Analysis of the quality of aviation lubricating oils by liquid and gas-liquid chromatography). *Khim. Tekhnol. Topl. Masel*, No. 6 (1986) 24-26; *C.A.*, 105 (1986) 63361a.

2691 Levy, J.W. and Yancey, J.A.: Dual capillary gas chromatographic analysis of alcohols and methyl *tert.*-butyl ether in gasolines. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 383-387.

2692 Mokeeva, R.N., Tsarfin, Ya.A. and Shtol'tse, M.: (Gas chromatographic analysis of aniline oxypropylation products). *Zh. Anal. Khim.*, 41 (1986) 1231-1234.

2693 Pang Yuechuan: (Gas chromatography of volatile acids in biogas fermentation fluid). *Weishengwuxue Tongbao*, 13 (1986) 41-43; *C.A.*, 105 (1986) 9190f.

2694 Peltonen, K.: Gas chromatographic-mass spectrometric determination of volatile compounds arising from epoxy powder paints during the curing process. *Analyst (London)*, 111 (1986) 819-822.

2695 P'yanova, V.P., Tsypysheva, L.G. and Kruglov, E.A.: (Quanlity control of petroleum solvents Nefras A-63/75 and Nefras A-65/75). *Neftepererab. Neftekhim.*, No. 4 (1986) 20-21; *C.A.*, 105 (1986) 45970u.

2696 Sakaki, T., Niino, K., Sakuma, H. and Sugawara, S.: Studies on tobacco aroma. Part V. Relationship between tobacco headspace volatiles and their smoking quality. *Agric. Biol. Chem.*, 50 (1986) 317-323; *C.A.*, 104 (1986) 183497a.

2697 Schulz, H., Böhringer, W., Kohl, C.P., Rahmann, N.M. and Vill, A.: Entwicklung und Anwendung der Kapillar-GC-Gesamtprobentechnik für Gas/Dampf-Vielstoffgemische. *Erdöl Kohle, Erdgas, Petrochem.*, 39 (1986) 333.

2698 Sheput'ko, N.B. and Golokozova, A.G.: (Gas chromatographic determination of impurities in *o*-xylene). *Neftepererab. Neftekhim.*, No. 3 (1986) 23-24; *C.A.*, 105 (1986) 17595g.

2699 Skachko, V.P., Gashchuk, M.D., Pazderskii, Yu.A. and Moiseev, I.I.: (Gas chromatographic determination of the products of reaction between methylformiate and acetic acid). *Zh. Anal. Khim.*, 41 (1986) 1228-1230.

2700 Sushko, L.G., Arzhannikova, Z.Sh. and Batyrbaev, N.A.: (Comparison of fractionating and chromatographic methods for determination of the content of narrow fractions in straight-run gasoline). *Neftepererab. Neftekhim.*, No. 6 (1986) 7-9; *C.A.*, 105 (1986) 45952q.

2701 Yamazaki, T., Inoue, T., Yamada, T. and Tanimura, A.: Analysis of residual vulcanization accelerators in baby bottle rubber teats. *Food Addit. Contam.*, 3 (1986) 145-152; *C.A.*, 105 (1986) 12227d.

See also 2434, 2461, 2516, 2554, 2555, 2591, 2593.

35e. Compounds with distinct biological activity and diverse chemical nature

2702 Brill, J.H. and Bertsch, W.: An investigation of sampling methods for the analysis of insect cuticular hydrocarbons. *J. Entomol. Sci.*, 20 (1985) 435-443; *C.A.*, 105 (1986) 57229x.

2703 Nakagawa, A., Tanishima, Y., Hirota, T., Takahagi, H., Horiguchi, M. and Kawahara, Y.: (Determination of a carbacyclin derivative in plasma by gas chromatography/mass spectrometry using a clean-up method with immobilized antibody). *Bunseki Kagaku*, 35 (1986) 298-302.

2704 Sadovskaya, V.L., Kazakov, V.S., Rakitin, L.Yu. and Muromtsev, G.S.: (GC-mass spectrometric analysis of fusicoccin metabolites produced by the phytopathogen *Fusicoccum amygdali* D.). *Bioorg. Khim.*, 12 (1986) 828-835; *C.A.*, 105 (1986) 57573e.

See also 2402.

35f. Complex mixtures and non-identified compounds

2705 Aratskova, A.A., Mel'nikova, V.I., Shushunova, A.P., Yashin, E.Ya. and Yashin, Ya.I.: (Investigation of mummy composition by chromatographic methods). *Zh. Anal. Khim.*, 41 (1986) 1096-1100 - also GC.

See also 2694.

36. CELLS AND CELLULAR PARTICLES

2706 Peng Chien Fang and Yang Jwu Maw: (The application of gas chromatography on the identification of anaerobes). *Kao-hsiung I Hsueh K'o Hsueh Tsa Chih*, 1 (1986) 175-187; *C.A.*, 105 (1986) 3853iy.

2707 Salati, F. and Kusuda, R.: (Gas chromatography-mass spectrometry of lipid a of *Edwardsiella tarda*). *Arch. Vet. Ital.*, 37 (1986) 43-52; *C.A.*, 105 (1986) 20697x.

2708 Scolari, G., Bottazzi, V. and Brambilla, E.: (Evaluation of volatile metabolic products for the characterization of homofermentative lactic acid bacteria cultures). *Sci. Tec. Latt.-Casearia*, 36 (1985) 593-602; *C.A.*, 105 (1986) 23150z.

2709 Seifert, H.S.H., Böhnel, H., Giercke, S., Heine, A., Hoffmann, D., Sukop, U. and Boege, D.H.: Routine identification of clostridia using headspace GC and integral biometric analysis. *Int. Lab.*, 17, No. 6 (1986) 46-56.

37. ENVIRONMENTAL ANALYSIS

37a. General papers and reviews

2710 Meriam, E.: Analytical and environmental chemistry of pollutants. *Swiss Chem.*, 8, No. 7/8 (1986) 39-44.

37b. Air pollution

2711 Dmitriev, M.T. and Mishchikhin, V.A.: (Gas chromatographic methyl bromide determination in the air and biological media). *Gig. Sanit.*, No. 4 (1986) 60-62; *C.A.*, 105 (1986) 11192b.

2712 Fielden, P.R., Smith, S.J. and Alder, J.F.: Rapid automatic gas chromatographic method for continual measurement of hydrogen cyanide and cyanogen in air. *Analyst (London)*, 111 (1986) 695-705.

2713 Maeda, T.: (Determination of methane and nonmethane in air). *Jpn. Kokai Tokkyo Koho Pat. JP 60,227,165 (85,227,165)* (Cl. G01N30/38), 12 Nov. 1985, Appl. 84/82, 937, 26 Apr. 1984; 8 pp.; *C.A.*, 105 (1986) 48269h.

2714 Miazek-Kula, M.: (Determination of diethylamine in air by gas chromatography). *Pr. Cent. Inst. Ochr. Pr.*, 35 (1985) 213-222; *C.A.*, 105 (1986) 11178b.

2715 Novitskii, V.F.: (Gas-chromatographic determination of phenol in air as its bromine derivative). *Gig. Tr. Prof. Zabol.*, No. 5 (1986) 55-56; *C.A.*, 105 (1986) 28955a.

2716 Pfäffli, P.: Phtalic anhydride as an impurity in industrial atmospheres: Assay in air samples by gas chromatography with electron-capture detection. *Analyst (London)*, 111 (1986) 813-817.

2717 Seckin, M.A., Aygün, S. and Ataman, O.Y.: Determination and speciation of mercury in a dental work-place by cold vapour atomic absorption spectrometry and gas-liquid chromatography. *Int. J. Environ. Anal. Chem.*, 26 (1986) 1-17.

2718 Thompson, J.M., Stephen, W.I. and Adarajah, B.S.: The gas chromatographic separation of anaesthetic agents and aerosol propellants in operating room air using serially packed columns. *Anal. Chim. Acta*, 178 (1985) 341-345.

2719 Tomingas, R., Mönch, W. and Matthiesen, U.: Remarks on the detection of aza arenes in airborne particulates. *Chromatographia*, 21 (1986) 327-330.

2720 Troshina, Z.P., Kulikova, N.P. and Andreev, E.L.: (Gas-chromatographic determination of methanol and furfural in the air of the working zone and in steam and gas wastes from hydrolytic yeast production). *Gidroliz. Lesokhim. Prom-st.*, No. 4 (1986) 23-25; *C.A.*, 105 (1986) 65477s.

2721 Ushakova, V.A., Titova, N.A. and Vagina, L.K.: (Gas chromatographic air determination of butyl and isobutyl alcohols in the work zone and at industrial sites). *Gig. Sanit.*, No. 3 (1986) 69-70; *C.A.*, 105 (1986) 11172v.

2722 Vagina, L.K., Slutskovskaya, L.P. and Titova, N.A.: (Gas chromatographic detection of dimethyldipropylentriamine and tetramethyldipropyltriamine in workplace air). *Gig. Sanit.*, No. 3 (1986) 87-88; *C.A.*, 105 (1986) 11173w.

2723 Williams, R., Sparacino, C., Petersen, B., Bumgarner, J., Jungers, R.H. and Lewtas, J.: Comparative characterization of organic emissions from Diesel particles, coce oven mains, roofing tar vapors and cigarette smoke condensate. *Intern. J. Environ. Anal. Chem.*, 26 (1986) 27-49.

See also 2496, 2553.

37c. Water pollution

2724 Aakerblom, M. and Jansson, L.: (Determination of pesticides in river and well waters). *Vaextskyddsrapp., Jordbruk*, 39 (1986) 184-188; *C.A.*, 105 (1986) 20343d.

2725 Armstrong, A., Daniel, W. and Golden, T.: Determination of distribution and concentration of trihalomethanes in aquatic recreational and therapeutic facilities by electron-capture GC. *LC-GC*, 4 (1986) 652-655; *C.A.*, 105 (1986) 66035h.

2726 Grimvall, A. and Saevenhed, R.: (Off-flavors in drinking water - causes and analytical methods). *Vaar Foeda*, 38 (1986) 66-74; *C.A.*, 105 (1986) 11670f.

2727 Kesten, E.M., Kempny, M.J.: (Optimization of the methodology for lindane and heptachlor determination in the industrial environment). *Acta Bioquim. Clin. Latinoam.*, 20 (1986) 49-60; *C.A.*, 105 (1986) 48093w.

2728 Koel, M.: (Chromatography of aqueous solutions of organic compounds). *Tead. Akad. Toim., Keem.*, 35 (1986) 154-156; *C.A.*, 105 (1986) 11716a.

2729 Kuthan, A.: (Significance and methods for determination of halogenated hydrocarbons in water). *Vodni Hospod.*, 36 (1986) 105-109; *C.A.*, 105 (1986) 29455z.

2730 Lee Hing-Biu, Stokker, Y.D. and Chau, A.S.Y.: Chemical derivation analysis of pesticide residues X. Analysis of ten acid herbicides in natural waters. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 557-560.

2731 Liu Shufen: (Gas-chromatographic determination of malathion and malaoxon in water). *Huanjing Huaxue*, 5 (1986) 26-29; *C.A.*, 105 (1986) 48675n.

2732 Measures, C.I. and Edmond, J.M.: Determination of beryllium in natural waters in real time using electron capture detection gas chromatography. *Anal. Chem.*, 58 (1986) 2065-2069.

2733 Ozaki, K., Tominaga, Y. and Kurosaki, H.: (Microanalysis of pesticides in river water and sediment. (4). Determination of pesticides by GC/MS (gas chromatography/mass spectrometry) with a capillary column). *Niigata-ken Kogai Kenkyusho Kenkyu Hokoku*, 10 (1985) 12-14; *C.A.*, 105 (1986) 2087u.

2734 Ozaki, K., Tominaga, Y. and Kurosaki, H.: (Microanalysis of pesticides in river water and sediment. (5). Simple method for determination of pesticide traces in river water by GC/MS (gas chromatography/mass spectrometry) with a capillary column). *Niigata-ken Kogai Kenkyusho Kenkyu Hokoku*, 10 (1985) 15-18; *C.A.*, 105 (1986) 2088v.

2735 Sithole, B.B., Williams, D.T., Lastoria, C. and Robertson, J.L.: Determination of halogenated phenols in raw and potable water by selected ion gas chromatography-mass spectrometry. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 466-473.

2736 Unger, M.A., MacIntyre, W.G., Greaves, J. and Huggett, R.J.: GC determination of butyltins in natural waters by flame photometric detection of hexyl derivatives with mass spectrometric confirmation. *Chemosphere*, 15 (1986) 461-470; *C.A.*, 105 (1986) 11675m.

See also 2585, 2658, 2660.

37d. Soil pollution

2737 Harmsen, J.: Sampling ans analysis of organic micropollutants in the soil. *TrAC.*, 5 (1986) 124-128.

2738 Jiang Shanchun: (Detection of phenols in Okinawa Trough sediments by GC-MS/gas chromatography-mass spectrometry). *Diqiu Huaxue*, No. 1 (1986) 85-87; *C.A.*, 105 (1986) 29560e.

2739 Ozretich, R.J. and Schroeder, W.P.: Determination of selected neutral priority organic pollutants in marine sediments, tissue, and reference materials utilizing bonded-phase sorbents. *Anal. Chem.*, 58 (1986) 2041-2048.

2740 Saiz-Jimenez, C. and de Leeuw, J.W.: Chemical characterization of soil organic matter fractions by analytical pyrolysis-gas chromatography-mass spectrometry. *J. Anal. Appl. Pyrolysis*, 9 (1986) 99-119; *C.A.*, 104 (1986) 87563y.

See also 2494, 2566, 2585, 2733.

Planar Chromatography

1. REVIEWS AND BOOKS

1062 Treiber, L.R.: Utility of thin-layer chromatography as an analytical tool. *J. Chromatogr. Sci.*, 24 (1986) 220-224 - a review with 15 refs.

See also 1288, 1310, 1331.

2. FUNDAMENTALS, THEORY AND GENERAL

2a. General

1063 Cooley, J.H. and Wong, A.L.: Reversed-phase thin-layer chromatography. *J. Chem. Educ.*, 63 (1986) 353; *C.A.*, 104 (1986) 224282x.

See also 1065, 1323, 1324.

2b. Thermodynamics and theoretical relationships

1064 Chen, S., Luo, G. and Zhao, H.: (A simple method for the selection of a mobile phase in thin-layer chromatography). *Sichuan Daxue Xuebao, Ziran Kexueban*, No. 1 (1985) 76-82; *C.A.*, 104 (1986) 236593n.

3. GENERAL TECHNIQUES

3a. Apparatus and accessories

1065 An, D. and Xiang, B.: (Software for pharmaceutical analysis (I). Design of a software package for evaluation and selection of optimal combination of solvent systems for paper and thin-layer chromatography). *Yaowu Fenxi Zazhi*, 6, No. 2 (1986) 69-73; *C.A.*, 105 (1986) 49123t.

1066 Soczewinski, E.: (Continuous thin-layer chromatography in sandwich tanks with an eluent distributor). *Zh. Anal. Khim.*, 41 (1986) 140-145; *C.A.*, 104 (1986) 218344c - a review with 28 refs.

3b. Detectors and detection reagents

1067 Merril, C.R. and Pratt, M.E.: A silver stain for the rapid quantitative detection of proteins or nucleic acids on membranes or thin layer plates. *Anal. Biochem.*, 156 (1986) 96-110.

3c. Sorbents, carriers, column and layer performance, packing procedures

1068 Hauck, H.E. and Jost, W.: (Stationary-phase material for thin-layer chromatography). *Ger. Offen. Pat.* DE 3,427,923 (Cl. G01N30/92), 30 Jan. 1986, Appl. 28 Jul. 1984; 29 pp.; *C.A.*, 104 (1986) 218333y.

1069 Jost, W., Hauck, H.E. and Fischer, W.: Cyano-modified pre-coated plates - a medium polar modification for high-performance thin-layer chromatography. *Chromatographia*, 21 (1986) 375-378.

1070 Moraru, E., Sarbu, C., Hodisan, T. and Liteanu, C.: (A stationary phase for thin-layer chromatography). *Rom. Pat.* RO 87,520 (Cl. G01H31/08), 30 Sep. 1985, Appl. 111,486, 01 Jul. 1983; 2 pp.; *C.A.*, 105 (1986) 17613m.

1071 Yanovskii, Yu.G., Vasin, A.V., Berezkin, V.G. and Bolotov, S.L.: (Study of the motions of mobile phases in thin-layer chromatography with molten organic compounds). *Zh. Fiz. Khim.*, 60 (1986) 402-405; *C.A.*, 104 (1986) 236592m.

1072 Zlatanov, L., Gonnet, C. and Marichy, M.: Demixing effects in thin-layer chromatography with NH_2-modified silica gel precoated plates. *Chromatographia*, 21 (1986) 331-334.

3d. Quantitative analysis

See 1067, 1324.

4. SPECIAL TECHNIQUES

4a. Automation and computerization

See 1065.

4g. Separation of enantiomers

See 1215, 1221, 1226.

4h. Other special techniques

1073 Lu, Y.: (Triangular thin-layer chromatography). *Sepu*, 4, No. 1-2 (1986) 124; *C.A.*, 105 (1986) 34873p.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5b. Cyclic hydrocarbons

1074 Kozlova, G.G., Vasilevskaya, L.N. and Botvin'eva, A.M.: (Study of aromatic hydrocarbon impurities in dimethylformamide and their determination by luminescence). *Zh. Anal. Khim.*, 41 (1986) 539-542; *C.A.*, 105 (1986) 34884t.

See also 1078.

5c. Halogen derivatives

1075 Guo, J. and Lu, F.: (Separation and purification of direct-brominated products of *p*-terphenyl). *Xi'an Jiaotong Daxue Xuebao*, 19, No. 1 (1985) 21-27; *C.A.*, 104 (1986) 206789p.

5d. Complex hydrocarbon mixtures

1076 Ponomareva, L.P. and Tkachenko, G.G.: (Quantitative determination of group composition of petroleum hydrocarbons in sea bottom sediments). *U.S.S.R. Pat.* SU 1,211,222 (Cl. G01N30/90), 15 Feb. 1986, Appl. 3,699,383, 31 Jan. 1984; *C.A.*, 105 (1986) 26904j.

6. ALCOHOLS

1077 Stoemmer, R.: (Contributions to the determination of diethylene glycol in wine. II. The HPTLC-method). *Dtsch. Lebensm.-Rundsch.*, 82 (1986) 150-152; *C.A.*, 105 (1986) 41119a.

1078 Yang, H.-Y.L., Majesky, M.W., Namkung, M.J. and Juchau, M.R.: Phase II biotransformation of carcinogens/atherogens in cultured aortic tissues and cells. II. Glucuronidation of 3-hydroxy-benzo[*a*]pyrene. *Drug Metab. Disp.*, 14 (1986) 293-298.

7. PHENOLS

1079 Bajaj, K.L. and Ahuja, K.L.: Ammonium vanadate-perchloric acid, a new reagent for the determination of phenolic compounds on thin layer plates. *Analusis*, 14 (1986) 161-162; *C.A.*, 104 (1986) 236604s.

1080 Kurth, M.J.: Thin-layer chromatographic separation of phenols. An undergraduate laboratory experiment. *J. Chem. Educ.*, 63 (1986) 360-361; *C.A.*, 104 (1986) 224285a.

See also 1345.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

8a. Flavonoids

1081 Kosuge, T., Ishida, K., Nagasawa, M.: (Preparation of an isoflavone derivative from *Astragalus* roots). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,246,394 (85,246,394) (Cl.CO7H17/07), 06 Dec. 1985, Appl. 84/100,623, 21 May 1984; 5 pp.; *C.A.*, 105 (1986) 12081b.

8b. Aflatoxins and other mycotoxins

1082 Czerwiecki, L.: (Zearalenone determination in cereals). *Rocz. Panstw. Zakl. Hig.*, 36 (1985) 373-377; *C.A.*, 105 (1986) 5275q.

1083 Hsieh, D.P.H., Beltran, L.M., Fukayama, M.Y., Rice, D.W. and Wong, J.J.: Production and isolation of aflatoxin M_1 for toxicological studies. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 510-512.

1084 Kozloski, R.P.: High performance thin layer chromatographic screening for aflatoxins in poultry feed by using silica Sep-Paks. *Bull. Environ. Contam. Toxicol.*, 36 (1986) 815-818; *C.A.*, 105 (1986) 23195t.

1085 Sakamoto, T., Swanson, S.P., Yoshizawa, T. and Buck, W.B.: Structures of new metabolites of diacetoxyscirpenol in the excreta of orally administered rats. *J. Agric. Food Chem.*, 34 (1986) 698-701.

1086 Whitaker, T.B., Dickens, J.W. and Giesbrecht, F.G.: Optimum methanol concentration and solvent/peanut ratio for extraction of aflatoxin from raw peanuts by modified AOAC method II. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 508-510.

8c. Other compounds with heterocyclic oxygen

1087 Kiss, I. and Racz, G.: (Fluorometric and spectrophotometric assay of umbelliferone isolated from the root of *Angelica archangelica* L.). *Rev. Med. (Tirgu-Mures, Rom.)*, 30, No. 2 (1984) 80-84; *C.A.*, 105 (1986) 30143c.

1088 Zakharova, T.P. and Komissarov, S.A.: (Fractional composition of some syntans). *Izv. Vyssh. Uchebn. Zaved., Tekhnol. Legk. Promsti.*, 29, No. 1 (1986) 57-59; *C.A.*, 104 (1986) 226631j.

1089 Zhao, T., Deng, X., Ye, Y., Yu, R. and Liu, J.: (Determination of isofraxidin in Ciwujia Chongji by thin-layer densitometry). *Nanjing Yaoxueyuan Xuebao*, 17, No. 1 (1986) 52-55; *C.A.*, 105 (1986) 49145b.

9. OXO COMPOUNDS, ETHERS AND EPOXIDES

1090 Hoque, E.: High-performance liquid chromatographic analysis of *p*-hydroxyacetophenone and *p*-hydroxyacetophenone-β-D-glucopyranoside, two major phenolic compounds in Norway spruce. *J. Chromatogr.*, 360 (1986) 452-458.

1091 Wang, M.: (Chemical assay of anthraquinone derivatives in plant drugs). *Yaoxue Xuebao*, 21 (1986) 230-237; *C.A.*, 104 (1986) 213335r - a review with 72 refs.

See also 1254, 1285.

10. CARBOHYDRATES

10a. Mono and oligosaccharides. Structural studies

1092 Angyal, S.J. and Mills, J.A.: Complexes of carbohydrates with metal cations. XIV. Separation of sugars and alditols by means of their lanthanum complexes. *Aust. J. Chem.*, 38 (1985) 1279-1285; *C.A.*, 104 (1986) 207566a.

1093 Donald, A.S.R. and Feeney, J.: Oligosaccharides obtained from a blood-group-Sd(a+) Tamm-Horsfall glycoprotein. *Biochem. J.*, 236 (1986) 821-828.

1094 Golc-Wondra, A. and Vitez, L.: (Methods of sugar analysis - thin-layer chromatography). *Nova Proizvod.*, 36 (1985) 35-38; *C.A.*, 104 (1986) 223689y.

1095 Hughes, R.C. and Feeney, J.: Ricin-resistant mutants of baby-hamster-kidney cells deficient in α-mannosidase-II-catalyzed processing of asparagine-linked oligosaccharides. *Eur. J. Biochem.*, 158 (1986) 227-237.

1096 Kakehi, K. and Honda, S.: Profiling of carbohydrates, glycoproteins and glycolipids. *J. Chromatogr.*, 379 (1986) 27-55 - a review.

1097 Koizumi, K., Utamura, T., Kuroyanagi, T., Hizukuri, S. and Abe, J.-I.: Analysis of branched cyclodextrins by high-performance liquid and thin-layer chromatography. *J. Chromatogr.*, 360 (1986) 397-406.

1098 Nakamura, T., Naito, A., Takahashi, Y. and Akanuma, H.: Oxidation of 1,5-anhydro-D-glucitol to 1,5-anhydro-D-fructose catalyzed by an enzyme from bacterial membranes. *J. Biochem. (Tokyo)*, 99 (1986) 607-613.

1099 Robin, J. and Bernard, J.: A charring method for quantitative determination of carbohydrates on thin-layer chromatograms. *Exp. Biol.*, 45, No. 2 (1986) 123-126; *C.A.*, 105 (1986) 34888x.

1100 Sarkar, M. and Mookerjea, S.: Recovery of dolichyl diphosphate oligosaccharide in methanolic aqueous phase prepared from rat liver microsomal fractions. *Biochem. J.*, 236 (1986) 913-916.

1101 Strong, F.C. and Duarte, A.M.A.: (Analysis of commercial Brazilian honeys for the detection of adulteration by corn syrup). *Ciênc. Tecnol. Aliment.*, 5 (1985) 116-122; *C.A.*, 105 (1986) 5256j.

1102 Tugrul, L. and Ozer, A.: TLC-flurodensitometric determination of monosaccharides in drug hydrolyzates. Part III. Application on various drug hydrolyzates. *Acta Pharm. Turc.*, 28, No. 1 (1986) 5-8; *C.A.*, 104 (1986) 213346v.

1103 Yuchi, S., Kimura, Y. and Kimura, Y.: (Antiobesity O-phenylglucose derivatives). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,208,993 (85,208,993) (Cl. C07H15/203), 21 Oct. 1985, Appl. 84/64,990, 30 Mar. 1984; 5 pp.; *C.A.*, 105 (1986) 30035u.

See also 1118, 1152, 1217.

10b. Polysaccharides, mucopolysaccharides, lipopolysaccharides

1104 Vermeulen, C.A. and Wessels, J.G.H.: Chitin biosynthesis by a fungal membrane preparation. Evidence for a transient non-crystalline state of chitin. *Eur. J. Biochem.*, 158 (1986) 411-415.

See also 1096, 1097.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

1105 Asif, M., Mannan, A., Itoh, T. and Matsumoto, T.: Analysis of *Albizzia lebbeck* flower oil. *Fette, Seifen, Anstrichm.*, 88 (1986) 180-182.

1106 Bielen, N. and Turina, S.: Possibility of linoleic and linolenic acid determination by argentation thin-layer chromatography. *Prehrambeno-Technol. Rev.*, 23, No. 3 (1985) 77-80; *C.A.*, 105 (1986) 59512h.

1107 Duval, D., Lynde, P., Hatzfeld, A. and Hatzfeld, J.: Dexymethasone-induced stimulation of arachidonic acid release by U_{937} cells grown in defined medium. *Biochim. Biophys. Acta*, 887 (1986) 204-213.

1108 Hamberg, M., Herman, C.A.and Herman, R.P.: Novel biological transformations of 15-L_S-hydroperoxy-5,8,11,13-eicosatetraenoic acid. *Biochim. Biophys. Acta*, 877 (1986) 447-457.

1109 Hasegawa, K., Uchida, T., Tamura, Z., Matsumoto, K., Kano, S. and Iri, H.: (A modified spot test for urinary vanilmandelic acid by open-system paper chromatography and its separation mechanism). *Rinsho Kagaku (Nippon Rinsho Kagakkai)*, 14 (1985) 321-326; *C.A.*, 105 (1986) 57243x.
1110 Hwang, P.L.H.: Unsaturated fatty acids as endogenous inhibitors of tamoxifen binding to anti-oestrogen-binding sites. *Biochem. J.*, 237 (1986) 749-755.
1111 Schwartzman, M.L., Abraham, N.G., Carroll, M.A., Levere, R.D. and McGiff, J.C.: Regulation of arachidonic acid metabolism by cytochrome P-450 in rabbit kidney. *Biochem. J.*, 238 (1986) 283-290.
1112 Troke, J.A. and Wilson, I.D.: Reversed-phase ion-pair thin-layer chromatography of organic acids. Influence of ion-pair structure and colvent pH on *Rp*. *J. Chromatogr.*, 360 (1986) 236-240.
1113 Ueda, N., Kaneko, S., Yoshimoto, T. and Yamamoto, S.: Purification of arachidonate 5-lipoxygenase from porcine leukocytes and its reactivity with hydroperoxyeicosatetraenoic acids. *J. Biol. Chem.*, 261 (1986) 7982-7988.

See also 1069, 1128, 1163, 1209, 1253, 1254.

11b. Prostaglandins

1114 Dimov, V., Green, K., Bygdeman, M. and Christensen, N.J.: Metabolism of 16,16-dimethyl-trans-Δ^2-prostaglandin E_1 methyl ester (ONO-802) following intravenous and vaginal administration to pregnant women. *Drug Metab. Disp.*, 14 (1986) 494-502.
1115 Honda, A., Morita, I., Murota, S.-i. and Mori, Y.: Appearance of the arachidonic acid metabolic pathway in human promyelitic leukemia (HL-60) cells during monocytic differentiation: enhancement of thromboxane synthesis by 1α,25-hydroxy-vitamin D-3. *Biochim. Biophys. Acta*, 877 (1986) 423-432.
1116 Van Sickle, W.A., Wilcox, H.G., Malik, K.U. and Nasjletti, A.: High density lipoprotein-induced cardiac prostacyclin synthesis *in vitro*: relationship to cardiac arachidonate mobilization. *J. Lipid Res.*, 27 (1986) 517-522.

11c. Lipids and their constituents

1117 Basu, S.K., Whisler, R.L. and Yates, A.J.: Effects of lectin activation on sialyltransferase activities in human lymphocytes. *Biochemistry*, 25 (1986) 2577-2581.
1118 Batra, A., Mehta, B.K. and Bokadia, M.M.: Characterization of *Amaranthus hybridus* phospholipids. *Fette, Seifen, Anstrichm.*, 88 (1986) 189-191.
1119 Beals, J.M. and Castellino, F.J.: The interaction of bovine factor IX, its activation intermediate, factor IXα, and its activation products, factor IXαα and factor IXαβ, with acidic phospholipid vesicles of various compositions. *Biochem. J.*, 236 (1986) 861-869.
1120 Bethke, U., Muething, J., Schauder, B., Conradt, P. and Muehlradt, P.F.: An improved semi-quantitative enzyme immunostaining procedure for glycosphingolipid antigens on high performance thin layer chromatograms. *J. Immunol. Methods*, 89 (1986) 111-116; *C.A.*, 105 (1986) 4707v.
1121 Cochet, C. and Chambaz, E.M.: Catalytic properties of a purified phosphatidylinositol-4-phosphate kinase from rat brain. *Biochem. J.*, 237 (1986) 25-31.
1122 Datta, S.C., Snider, R.M. and Radin, N.S.: Uptake by neuroblastoma cells of glucosylceramide, glucosylceramide glucosidase, its stimulator protein and phosphatidylserine. *Biochim. Biophys. Acta*, 877 (1986) 387-398.
1123 DeGeorge, J.J., Morell, P., McCarthy, K.D. and Lapetina, E.G.: Cholinergic stimulation of arachidonic acid and phosphatidic acid metabolism in C62B glioma cells. *J. Biol. Chem.*, 261 (1986) 3428-3433.
1124 Dennis, R.D.: Wiegandt, H., Haustein, D., Knowles, B.H. and Ellar, D.J.: Thin-layer chromatography overlay technique in the analysis of the binding of the solubilized protoxin of *Bacillus thuringiensis* var. *kurstaki* to an insect glycosphingolipid of known structure. *Biomed. Chromatogr.*, 1 (1986) 31-37.
1125 Dugan, L.L., Demediuk, P., Pendley, C.E., II and Horrocks, L.A.: Separation of phospholipids by high-performance liquid chromatography: all major classes, including ethanolamine and choline plasmalogens, and most minor classes, including lysophosphatidylethanolamine. *J. Chromatogr.*, 378 (1986) 317-327.

1126 El-Sayed, L., Ahmad, A.K.S. and Amer, M.M.: Detection of lard in hydrogenated fats. *Riv. Ital. Sostanze Grasse*, 62 (1985) 553-557; *C.A.*, 104 (1986) 205606q.
1127 Fan, T., deMan, L. and deMan, J.M.: Reactivity of fatty acids in the different positions of the triglycerides during hydrogenation of canola oil. *J. Am. Oil Chem. Soc.*, 63 (1986) 898-901.
1128 Flint, A.P.F., Leat, W.M.F., Sheldrick, E.L. and Stewart, H.J.: Stimulation of phosphoinositide hydrolysis by oxytocin and the mechanism by which oxytocin controls prostaglandin synthesis in the ovine endometrium. *Biochem. J.*, 237 (1986) 797-805.
1129 Fujisaki, S., Nishino, T. and Katsuki, H.: Biosynthesis of isoprenoids in intact cells of *Escherichia coli*. *J. Biochem. (Tokyo)*, 99 (1986) 1137-1146.
1130 Fukushi, Y., Nudelman, E., Levery, S.B., Higuchi, T. and Hakomori, S.-i.: A novel disialoganglioside ($IV^3NeuAcIII^6NeuAcLc_4$) of human adenocarcinoma and the monoclonal antibody (FH9) defining this disialosyl structure. *Biochemistry*, 25 (1986) 2859-2866.
1131 Ghidoni, R., Trinchera, M., Venerando, B., Fiorilli, A., Sonnino, S. and Tettamanti, G.: Incorporation and metabolism of exogenous G_{M1} ganglioside in rat liver. *Biochem. J.*, 237 (1986) 147-155.
1132 Hanfland, P., Kordowicz, M., Peter-Katalinic, J., Pfannschmidt, G., Crawford, R.J., Graham, H.A. and Egge, H.: Immunochemistry of the Lewis blood-group system: isolation and structures of Lewis-c active and related glycosphingolipids from the plasma of blood-group O Le(a-b) nonsecretors. *Arch. Biochem. Biophys.*, 246 (1986) 655-672.
1133 Hansen, H.O., Jensen, S.S. and Knudsen, J.: Absence of monoacylglycerol pathway for triacylglycerol synthesis in goat mammary gland. *Biochem. J.*, 238 (1986) 173-176.
1134 Hassanien, F.R. and Mukherjee, K.D.: Isolation of lipase from germinating oilseeds for biotechnological processes. *J. Am. Oil Chem. Soc.*, 63 (1986) 893-897.
1135 Huang, E.M. and Detwiler, T.C.: The effects of lithium on platelet phosphoinositide metabolism. *Biochem. J.*, 236 (1986) 895-901.
1136 Javadov, S.A., Preobrazhensky, A.N. and Saks, V.A.: (Effect of phosphocreatine on the lysophosphoglyceride level during total ischemia of rat myocardium). *Biokhimiya (Moscow)*, 51 (1986) 668-674.
1137 Johnson, F.L., Babiak, J. and Rudel, L.L.: High density lipoprotein accumulation in perfusates of isolated livers of African green monkeys. Effects of saturated *versus* polyunsaturated dietary fat. *J. Lipid Res.*, 27 (1986) 537-548.
1138 Kamanna, V.S. and Chandrasekhara, N.: Lipid composition of garlic. *Fette, Seifen, Anstrichm.*, 88 (1986) 136-139.
1139 Kiguchi, K., Henning-Chubb, C. and Huberman, E.: Alteration in glycosphingolipid pattern during phorbol-12-myristate-13-acetate-induced cell differentiation in human T-lymphoid leukemia cells. *Cancer Res.*, 46 (1986) 3027-3033.
1140 Kolarovic, L. and Fournier, N.C.: A comparison of extraction methods for the isolation of phospholipids from biological sources. *Anal. Biochem.*, 156 (1986) 244-250.
1141 Kolattukudy, P.E. and Rogers, L.: Acyl-CoA reductase and acyl-CoA: fatty alcohol acyl transferase in the microsomal preparation from the bovine meibomian gland. *J. Lipid Res.*, 27 (1986) 404-411.
1142 Kuksis, A. and Myher, J.J.: Lipids and their constituents. *J. Chromatogr.*, 379 (1986) 57-90 - a review.
1143 Langeland, N., Haarr, L. and Holmsen, H.: Polyphosphoinositide metabolism in baby-hamster kidney cells infected with herpes simplex virus type 1. *Biochem. J.*, 237 (1986) 707-712.
1144 Larson, G.: Globoseries glycosphingolipids of human meconium. *Arch. Biochem. Biophys.*, 246 (1986) 531-545.
1145 Levade, T., Maret, A., Salvayre, R., Livni, N., Rogalle, P. and Douste-Blazy, L.: Biochemical and ultrastructural studies on an Epstein-Barr virus-transformed lymphoid cell line from a Niemann-Pick disease type C patient. *Biochim. Biophys. Acta*, 877 (1986) 415-422.
1146 Lingwood, C.A., Dennis, J., Hsu, E., Sakac, D., Oda, K., Strasberg, P., Taylor, T., Warren, I., Yeger, H. and Baumal, R.: Regulation of renal sulfoglycolipid biosynthesis. *Biochim. Biophys. Acta*, 877 (1986) 246-251.
1147 Low, M.G., Carroll, R.C. and Cox, A.C.: Characterization of multiple forms of phosphoinositide-specific phospholipase C purified from human platelets. *Biochem. J.*, 237 (1986) 139-145.

1148 Malgat, M., Maurice, A. and Baraud, J.: Sphingomyelin and ceramide-phosphoethanolamine synthesis by microsomes and plasma membranes from rat liver and brain. *J. Lipid Res.*, 27 (1986) 251-260.

1149 Montecucco, C. and Schiavo, G.: 1-Palmitoyl-2-(*p*-benzoyl)phosphatidylcholine, a photoactive phospholipid for the labelling of membrane components. *Biochem. J.*, 237 (1986) 309-312.

1150 Morton, R.E.: Specifity of lipid transfer protein for molecular species of cholesteryl ester. *J. Lipid Res.*, 27 (1986) 523-529.

1151 Mustafa, J., Gupta, A., Agarwal, R. and Osman, S.M.: *Cupania anacardioides*: a rich source of cyanolipids. *J. Am. Oil Chem. Soc.*, 63 (1986) 671-672.

1152 Nakamura, K. and Handa, S.: Biochemical properties of N-methylamides of sialic acids in gangliosides. *J. Biochem. (Tokyo)*, 99 (1986) 219-226.

1153 Nichols, G.E., Lovejoy, J.C., Borgman, C.A., Sanders, J.M. and Young, W.W., Jr.: Isolation and characterization of two types of MDCK epithelial cell clones based on glycosphingolipid pattern. *Biochim. Biophys. Acta*, 887 (1986) 1-12.

1154 Nudelman, E., Fukushi, Y., Levery, S.B., Higuchi, T. and Hakamori, S.-i.: Novel fucolipids of human adenocarcinoma: disialosyl Le^a antigen ($III^4FucIII^6NeuAcIV^3NeuAcLc_4$) of human colonic adenocarcinoma and the monoclonal antibody (FH7) defining this structure. *J. Biol. Chem.*, 261 (1986) 5487-5495.

1155 Opstvedt, A., Rongved, S., Aarsaether, N., Lillehaug, J.R. and Holmsen, H.: Differential effects of chlorpromazine on secretion, protein phosphorylation and phosphoinositide metabolism in stimulated platelets. *Biochem. J.*, 238 (1986) 159-166.

1156 Pajares, M.A., Villalba, M. and Mato, J.M.: Purification of phospholipid methyltransferase from rat liver microsomal fraction. *Biochem. J.*, 237 (1986) 699-705.

1157 Riboni, L., Sonnino, S., Acquotti, D., Malesci, A., Ghidoni, R., Egge, H., Mingrino, S. and Tettamanti, G.: Natural occurrence of ganglioside lactones. Isolation and characterization of G_{D1b} inner ester from adult human brain. *J. Biol. Chem.*, 261 (1986) 8514-8519.

1158 Ridell, M., Minnikin, D.E., Parlett, J.H. and Mattsby-Baltzer, I.: Detection of mycobacterial lipid antigens by a combination of thin-layer chromatography and immunostaining. *Lett. Appl. Microbiol.*, 2, No. 4 (1986) 89-92; *C.A.*, 105 (1986) 40615x.

1159 Roughan, G.: *A simplified isolation of phosphatidylglycerol. Plant Sci. (Limerick)*, 43, No. 1 (1986) 57-62; *C.A.*, 104 (1986) 203292k.

1160 Saether, O., Ellingsen, T.E. and Mohr, V.: Lipids of North Atlantic krill. *J. Lipid Res.*, 27 (1986) 274-285.

1161 Schimmel, R.J., Dzierzanowski, D., Elliott, M.E. and Honeyman, T.W.: Stimulation of phosphoinositide metabolism in hamster brown adipocytes exposed to α_1-adrenergic agents and its inhibition with phorbol esters. *Biochem. J.*, 236 (1986) 757-764.

1162 Schuch, R., Ahmad, F. and Mukherjee, K.D.: Composition of triacylglycerols containing cyclopropene fatty acids in seed lipids of Munguba (*Bombax munguba* Mart.). *J. Am. Oil Chem. Soc.*, 63 (1986) 778-783.

1163 Seto, A., Kitagawa, K., Yamashita, M. and Fujita, T.: (Preparation of glycolipids rich in eicosapentaenoic acid from *Chlorella minutissima*). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 63,624 (86 63,624) (Cl. A61K35/80), 01 Apr. 1986, Appl. 84/184, 550, 05 Sep. 1984; 3 pp.; *C.A.*, 105 (1986) 30041t.

1164 Smith, D.M., Jr. and Waite, M.: Phospholipid metabolism in human neutrophil subfractions. *Arch. Biochim. Biophys.*, 246 (1986) 263-273.

1165 Takamizawa, K., Iwamori, M., Mutai, M. and Nagai, Y.: Gangliosides of bovine buttermilk. Isolation and characterization of a novel monosialoganglioside with a new branching structure. *J. Biol. Chem.*, 261 (1986) 5625-5630.

1166 Taki, T., Hirabayashi, Y., Ishikawa, H., Ando, S., Kon, K., Tanaka, Y. and Matsumoto, M.: A ganglioside of rat ascites hepatoma AH 7974 F cells. Occurrence of a novel disialoganglioside ($G_{D1\alpha}$) with a unique N-acetylneuraminosyl (α2-6)-N-acetylgalactosamine structure. *J. Biol. Chem.*, 261 (1986) 3075-3078.

1167 Tanaka, Y., Takei, T., Aiba, T., Masuda, K., Kiuchi, A. and Fujiwara, T.: Development of synthetic lung surfactans. *J. Lipid Res.*, 27 (1986) 475-485.

1168 Wertz, P.W., Stover, P.M., Abraham, W. and Downing, D.T.: Lipids of chicken epidermis. *J. Lipid Res.*, 27 (1986) 427-435.

1169 Witzke, N.M. and Bittman, R.: Convenient synthesis of racemic mixed-chain ether glycerophosphocholines from fatty alkyl allyl ethers: useful analogs for biophysical studies. *J. Lipid Res.*, 27 (1986) 344-351.

1170 Wynkoop, E.M., Broekman, M.J., Korchak, H.M., Marcus, A.J. and Weissmann, G.: Phospholipid metabolism in human neutrophils activated by N-formyl-methionyl-leucyl-phenylalanine. Degranulation is not required for release of arachidonic acid: studies with neutrophils and neutrophil-derived cytoplasts. *Biochem. J.*, 236 (1986) 829-837.
1171 Zeigler, M. and Bach, G.: Internalization of exogenous gangliosides in cultured skin fibroblasts for the diagnosis of mucolipidosis IV. *Clin. Chim. Acta*, 157 (1986) 183-190.

See also 1096, 1110, 1193, 1335.

12. ORGANIC PEROXIDES

See 1108.

13. STEROIDS

1172 Brind, J.L., Kuo, S.W., Chervinsky, K., Fitzgerald, K. and Orentreich, N.: A new partition thin-layer chromatographic method for steroid separations. *Steroids*, 45 (1985) 565-571; *C.A.*, 105 (1986) 773r.
1173 Xue, S. and Yang, M.: (The application of system combination methods et al. in selection of optimal combination of solvent systems for thin-layer chromatography of 16 hormonal drugs). *Yaowu Fenxi Zazhi*, 6, No. 2 (1986) 108-110; *C.A.*, 105 (1986) 49154d.

13a. Pregnane and androstane derivatives

1174 Ban, P. and Stanciu, T.: (Study of the purity of prednisolone acetate by thin-layer chromatography). *Farmacia (Bucharest)*, 33 (1985) 135-140; *C.A.*, 105 (1986) 12206w.
1175 Boursier, B. and Delpont, C.: (Determination of urinary 17α-trenbolone residues in the calf. Use of a thin-layer chromatographic method and comparison with results obtained by RIA). *Recl. Med. Vet.*, 162 (1986) 157-162; *C.A.*, 105 (1986) 54697n.
1176 Frank, H., Heinisch, G. and Tanzer, F.: Differentiation of drug substances. Part 6. Some selected keto-steroids. *Pharmazie*, 41 (1986) 488-490 - R_{rel} for 25 compounds and colour reactions.
1177 Koyama, T., Okamoto, M., Futamura, A., Goto, S. and Tamaoki, S.: (Determination of hydrocortisone in powdered preparations). *Byoin Yakugaku*, 12, No. 1 (1986) 37-40; *C.A.*, 105 (1986) 30153f.
1178 Pavlova, A.Z. and Rakov, S.S.: (Determination of steroid hormones in material evidence of biological origin by thin-layer chromatography). *Sud.-Med. Ekspert.*, 29, No. 1 (1986) 33-34; *C.A.*, 104 (1986) 220250n.
1179 Shackleton, C.H.L.: Profiling steroid hormones and urinary steroids. *J. Chromatogr.*, 379 (1986) 91-156 - a review.
1180 Sunahara, G.I. and Bellward, G.D.: Testosterone metabolism in rat liver cytosolic androgen binding assays. *Drug Metab. Disp.*, 14 (1986) 366-369.

See also 1069, 1343.

13b. Estrogens

1181 Moretti, G., Boniforti, L., Secco, F., Amici, M., Cammarata, P. and Innocenti, R.: (Studies on diethylstilbestrol residues in bovine feces using HPTLC and GC-MS). *Ann. Ist. Super. Sanita*, 21 (1985) 391-400; *C.A.*, 105 (1986) 23159j.

See also 1064, 1069.

13c. Sterols

1182 Akihisa (ne Itoh), T., Ghosh, P., Thakur, S., Rosenstein, F.U. and Matsumoto, T.: Sterol compositions of seeds and mature plants of family *Cucurbitaceae*. *J. Am. Oil Chem. Soc.*, 63 (1986) 653-658.
1183 Etingin, O.R., Weksler, B.B. and Hajjar, D.P.: Cholesterol metabolism is altered by hydrolytic metabolites of prostacyclin in arterial smooth muscle cells. *J. Lipid Res.*, 27 (1986) 530-536.
1184 Hiermann, A. and Mayr, K.: Dünnschicht-, Säulen- und Hochleistung-Flüssigkeits-chromatographischer Auftrennung pflanzlicher Sterole an alkylsilylierten Kieselgelen. *J. Chromatogr.*, 361 (1986) 417-420.
1185 Kasama, T. and Seyama, Y.: Biochemical diagnosis of cerebrotendinous xanthomatosis using reversed phase thin layer chromatography. *J. Biochem. (Tokyo)*, 99 (1986) 771-775.
1186 Maerker, G. and Bunick, F.J.: Cholesterol oxides II. Measurement of the 5,6-epoxides during cholesterol oxidation in aqueous dispersions. *J. Am. Oil Chem. Soc.*, 63 (1986) 771-777.
1187 Maerker, G. and Unruh, J., Jr.: Cholesterol oxides I. Isolation and determination of some cholesterol oxidation products. *J. Am. Oil Chem. Soc.*, 63 (1986) 767-771.
1188 Sripada, P.K.: A simple method for the synthesis of cholesteryl ethers. *J. Lipid Res.*, 27 (1986) 352-353.

See also 1107, 1110, 1137, 1150.

13b. Bile acids and alcohols

1189 Deng, Z., Wang, F., Zheng, L. and Luo, M.: (Determination of conjugated bile acid in gallstone with scanning thin-layer chromatography). *Fenxi Huaxue*, 14 (1986) 382-384; *C.A.*, 105 (1986) 57278n.
1190 Iida, T., Momose, T., Chang, F.C. and Nambara, T.: Potential bile acid metabolites. XI. Syntheses of stereoisomeric 7,12-dihydroxy-5α-cholanic acids. *Chem. Pharm. Bull.*, 34 (1986) 1934-1938.
1191 Iida, T., Momose, T., Manbara, T. and Chang, F.C.: Potential bile acid metabolites. X. Syntheses of stereoisomeric 3,7-dihydroxy-5α-cholanic acids. *Chem. Pharm. Bull.*, 34 (1986) 1929-1933.
1192 Kihira, K., Noma, Y., Tsuda, K., Watanabe, T., Yamamoto, Y., Une, M. and Hoshita, T.: Absolute configuration at C-24 of 5β-ranol, a principal bile alcohol of the bullfrog. *J. Lipid Res.*, 27 (1986) 393-397.
1193 Sambaiah, K., Ganesh Bhat, B. and Chandrasekhara, N.: Elimination of phospholipid interference in biliary bile acid determination by thin-layer chromatography-densitometry. *J. Chromatogr.*, 380 (1986) 235-237.
1194 Selivanovski, B., Zivkovic, L., Hranisavljevic, S. and Turner, J.: (Influence of the collection method on quality of beef and pigs bile). *Tehnol. Mesa*, 26 (1985) 351-353; *C.A.*, 105 (1986) 48876d.
1195 Usui, E. and Okuda, K.: Identification of 7α,12α-dihydroxy-5β-cholestan-3-one 3α-reductase as 3α-hydroxysteroid dehydrogenase. *Biochim. Biophys. Acta*, 877 (1986) 158-166.

14. STEROID GLYCOSIDES AND SAPONINS

1196 Nakayama, K., Fujino, H. (Nee Kimata), Kasai, R., Tanaka, O. and Zhou, J.: Saponins of pericarps of Chinese *Sapindus delavayi* (Pyi-shiau-tzu), a source of natural surfactants. *Chem. Pharm. Bull.*, 34 (1986) 2209-2213.
1197 Tani, T., Katsuki, T., Kubo, M. and Arichi, S.: Histochemistry. IX. Distribution of saikosaponins in *Bupleurum falcatum* root. *J. Chromatogr.*, 360 (1986) 407-416.

See also 1069.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

15a. Terpenes

1198 Nishino, C., Kobayashi, K., Sato, S. and Oya, J.: (Antitumor diterpenes from (*Chamaecyparis pisifera*). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 50,916 (86 50,916) (Cl. A61K31/19), 13 Mar. 1986, Appl. 84/172,597, 20 Aug. 1984; 5 pp.; *C.A.*, 105 (1986) 30039y.

See also 1253.

15c. Bitter substances

1199 Luo, J. and Lou, Z.: (TLC-densitometry determination of bitter glycosides in the Chinese drug Longdan, radix *Gentianae*, and its quality evaluation). *Yaoxue Xuebao*, 21 (1986) 40-46; *C.A.*, 104 (1986) 213344t.

16. NITRO AND NITROSO COMPOUNDS

See 1207.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

17a. Amines and polyamines

1200 Cserhati, T., Bordas, B. and Szögyi, M.: Determination of the lipophilicity of some aniline derivatives by reversed-phase thin-layer chromatography. The effect of salts. *Chromatographia*, 21 (1986) 312-316 - R_M values for 37 compounds in 14 solvent systems.

1201 Hougaard, D.M., Nielsen, J.H. and Larsson, L.-I.: Localization and biosynthesis of polyamines in insulin-producing cells. *Biochem. J.*, 238 (1986) 43-47.

1202 Karawya, M.S., Khayyal, S.E., Farrag, N.M. and Ayad, M.M.: Screening of diphenylamine as an intihyperglycemic agent in certain edible plant organs. *Acta Pharm. Hung.*, 56, No. 2 (1986) 55-58; *C.A.*, 105 (1986) 12202s.

1203 Matschiner, H., Heberer, H. and Guennel, G.: (Determination of long-chain aliphatic amines). *Ger. (East) Pat.* DD 228,900 (Cl. G01N21/64), 23 Oct. 1985, Appl. 267,106, 07 Sep. 1984; 9 pp.; *C.A.*, 105 (1986) 17616q.

1204 Seiler, N.: Polyamines. *J. Chromatogr.*, 379 (1986) 157-176 - a review.

1205 Thams, P., Capito, K. and Hedeskov, C.J.: An inhibitory role for polyamines in protein kinase c activation and insulin secretion in mouse pancreatic islets. *Biochem. J.*, 237 (1986) 131-138.

See also 1118, 1217.

17b. Catecholamines and their metabolites

1206 Liu, C. and Miao, H.: (Stability of catecholamine injections and improvement of the formulation. 2.). *Yiyao Gongye*, 17, No. 3 (1986) 102-106; *C.A.*, 105 (1986) 29983v.

17c. Amine derivatives and amides (excluding peptides)

1207 Gracheva, I.N., Zhukoca, G.F., Kovel'man, I.R., Pimenova, V.V. and Tochilkin, A.I.: (Fluorescence determination of carcinogenic N-nitrosamines by using N-(8-methoxy-5-quinolinesulfonyl)aziridine). *Zh. Anal. Khim.*, 41 (1986) 356-359; *C.A.*, 104 (1986) 201662g.

See also 1074.

18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

18a. Amino acids and their derivatives

1208 Airas, R.K., Schischkoff, J. and Cramer, F.: Biochemical comparison of the *Neurospora crassa* wild-type and the temperature-sensitive leucine-auxotroph mutant leu-5. Detailed kinetic comparison of the leucyl-tRNA synthetases. *Eur. J. Biochem.*, 158 (1986) 51-56.

1209 Cheynier, V.F., Trousdale, E.K., Singleton, V.L., Salgues, M.J. and Wylde, R.: Characterization of 2-S-glutathionylcaftaric acid and its hydrolysis in relation to grape wines. *J. Agric. Food Chem.*, 34 (1986) 217-221.

1210 Deyl, Z., Hyanek, J. and Horakova, M.: Profiling of amino acids in body fluids and tissues by means of liquid chromatography. *J. Chromatogr.*, 379 (1986) 177-250 - a review.

1211 Hojrup, P., Andersen, S.O. and Roepstorff, P.: Primary structure of a structural protein from the cuticle of the migratory locust, *Locusta migratoria*. *Biochem. J.*, 236 (1986) 713-720.

1212 Jiang, Y., Huang, M., Zhu, G., Zhou, L., Wang, M. and Zheng, Y.: (Analysis of free amino acids in silkworm excrement, *Dioscorea opposita*, *Astragalus membranaceus*, *Angelica sinensis* and *Codonopsis pilosula*). *Zhongcaoyao*, 17, No. 3 (1986) 105-107; *C.A.*, 105 (1986) 29863f.

1213 Jost, W., Michali, M. and Herbert, H.: (Separation of derivatized amino acids on HPTLC precoated plates with cyano modification). *GIT Fachz. Lab.*, 30 (1986) 105-108; *C.A.*, 105 (1986) 17551q.

1214 Khanna, N.C., Tokuda, M., Chong, S.M. and Waisman, D.M.: Phosphorylation of P36 *in vitro* by protein kinase C. *Biochem. Biophys. Res. Commun.*, 137 (1986) 397-403.

1215 Martens, J., Guenther, K. and Schickedanz, M.: Resolution of optical isomers by thin-layer chromatography. Enantiomeric purity of D-penicillamine. *Arch. Pharm. (Weinheim)*, 319 (1986) 461-465; *C.A.*, 105 (1986) 6791s.

1216 Mauro, J.M., Lewis, R.V. and Barden, R.E.: Photoaffinity labelling of carnitine acetyltransferase with S-(*p*-azidophenacyl)thiocarnitine. *Biochem. J.*, 237 (1986) 533-540.

1217 Pallante, S.L., Lisek, C.A., Dulik, D.M. and Fenselau, C.: Glutathione conjugates. Immobilized enzyme synthesis and characterization by fast atom bombardment mass spectrometry. *Drug Metab. Disp.*, 14 (1986) 313-318.

1218 Xu, D. and Xu, G.: (Thin layer chromatography for separation of iodotyrosine and iodothyronine). *Sepu*, 4 (1986) 112-114; *C.A.*, 105 (1986) 18638k.

1219 Yamato, M., Koguchi, T., Okachi, R., Yamada, K., Nakayama, K., Kase, H., Karasawa, A. and Shuto, K.: K-26, a novel inhibitor of angiotensin I converting enzyme produced by an actinomycete K-26. *J. Antibiot.*, 39 (1986) 44-52.

See also 1069, 1201.

18b. Peptides and peptidic and proteinous hormones

1220 Bausback, H.H. and Ward, P.E.: Degradation of low-molecular-weight opioid peptides by vascular plasma membrane aminopeptidase M. *Biochim. Biophys. Acta*, 882 (1986) 437-444.

1221 Guenther, K., Martens, J. and Schickedanz, M.: (Thin-layer chromatographic separation of dipeptide stereoisomers). *Angew. Chem.*, 98 (1986) 284-285; *C.A.*, 104 (1986) 207663e.

1222 Hardie, D.G., Carling, D., Ferrari, S., Guy, P.S. and Aitken, A.: Characterization of the phosphorylation of rat mammary ATP-citrate lyase and acetyl-CoA carboxylase by Ca^{2+} and calmodulin-dependent multiprotein kinase and Ca^{2+} and phospholipid-dependent protein kinase. *Eur. J. Biochem.*, 157 (1986) 553-561.

1223 Hefford, M.A., Oda, G. and Kaplan, H.: Structure - function relationships in the free insulin monomer. *Biochem. J.*, 237 (1986) 663-668.

1224 Moreno, S., Cardini, C.E. and Tandecarz, J.S.: α-Glucan synthesis on a protein primer, uridine diphosphoglucose: protein transglucosylase I. Separation from starch synthetase and phosphorylase and a study of its properties. *Eur. J. Biochem.*, 157 (1986) 539-545.

1225 Shichi, H. and O'Meara, P.D.: Purification and properties of anionic glutathione S-transferase from bovine ciliary body. *Biochem. J.*, 237 (1986) 365-371.

1226 Wang, K.T., Chen, S.T. and Lo, L.C .: The thin-layer chromatographic separation of enantiomeric dipeptides. *Fresenius' Z. Anal. Chem.*, 324 (1986) 339-340.

See also 1219, 1227, 1228, 1229.

18c. General techniques of elucidation of structure of proteins

1227 Irie, M., Watanabe, H., Ohgi, K. and Harada, M.: Site of alkylation of the major ribonuclease from *Aspergillus saitoi* iodoacetate. *J. Biochem. (Tokyo)*, 99 (1986) 627-633.

1228 Karpova, O.I., Ananyeva, N.M., Ermokhina, T.M. and Krasheninnikov, I.A.: (Some peculiarities of primary structure of histone H2b of the mould fungus *Neurospora crassa*). *Biokhimiya (Moscow)*, 51 (1986) 788-800.

1229 Walker, P.: Thyroxine increases neonatal mouse submandibular gland mRNA-directed synthesis of epidermal growth factor. *Can. J. Biochem. Cell Biol.*, 64 (1986) 290-296.

19. PROTEINS

19a. General techniques

1230 Imaeda, K., Ohsawa, K., Uchiyama, K., Nakamura, S. and Tokieda, T.: Light-scanning photoacoustic densitometer applied to protein determination. *Anal. Sci.*, 2, No. 1 (1986) 9-13; *C.A.*, 105 (1986) 53838x.

See also 1067.

19b. Proteins of cells, viruses and subcellular particles (excluding blood cells and platelets

See 1237.

20. ENZYMES

20c. Transferases transferring phosphorus containing groups (E.C. 2.7.-.-)

See 1227.

20f. Other hydrolases

1231 Bond M.D., Auld, D.S. and Lobb, R.R.: A convenient fluorescent assay for vertebrate collagenases. *Anal. Biochem.*, 155 (1986) 315-321.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

1232 Budowsky, E.I., Axentyeva, M.S., Abdurashidova, G.G., Simukova, N.A. and Rubin, L.B.: Induction of polynucleotide-protein cross-linkages by ultraviolet irradiation. Peculiarities of the high-intensity laser pulse irradiation. *Eur. J. Biochem.*, 159 (1986) 95-101.

1233 Ferrera, R.S., Boese, J.L. and Thrasher, J.J.: Improved spray reagent for thin layer chromatographic method for detecting uric acid: collaborative study. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 499-503.

1234 Furth, J.J. and Su, C.-Y.: Transcription of genomic bovine and *Xenopus laevis* DNA species by RNA polymerase III in HeLa-cell cytosol extracts. *Biochem. J.*, 237 (1986) 827-835.

1235 Garcia-Segura, J.M., Orozco, M.M., Fominaya, J.M. and Gavilanes, J.G.: Purification, molecular and enzymic characterization of an acid RNase from the insect *Ceratitis capitata*. *Eur. J. Biochem.* 158 (1986) 367-372.

1236 Hamel, E., Batra, J.K., Huang, A.B. and Lin, C.M.: Effects of pH tubulin-nucleotide interactions. *Arch. Biochem. Biophys.*, 245 (1986) 316-330.
1237 Longabaugh, J.P., Vatner, D.E., Graham, R.M. and Homcy, C.J.: NADP improves the efficiency of cholera toxin catalyzed ADP-ribosylation in liver and heart membranes. *Biochem. Biophys. Res. Commun.*, 137 (1986) 328-333.
1238 McCoy, J.M., Keene, N.M. and Jones, D.S.: The nucleotide sequence of *Scenedesmus obliquus* chloroplast elongator methionine-accepting tRNA. *Biochem. J.*, 238 (1986) 297-300.
1239 Sato, F., Omura, H. and Hayano, K.: Adenosine deaminase activity in soils. *Soil Sci. Plant Nutr. (Tokyo)*, 32 (1986) 107-112; *C.A.*, 104 (1986) 206078f.
1240 Tsujibo, H., Taniguchi, T., Koyama, I., Kubo, M. and Inamori, Y.: Hypotensive compounds isolated from the dried body of *Naja naja kaouthia* Lesson. I. Isolation of inosine as a hypotensive principle and structure-activity study of related compounds. *Chem. Pharm. Bull.*, 34 (1986) 1716-1720.
1241 Wu, F.Y.-H., Abdulwajid, A.W. and Solaiman, D.: Synthesis and properties of adenosine-5'-triphosphoro-γ-1-(5-sulfonic acid)naphthyl ethylamidate: a fluorescent nucleotide substrate for DNA-dependent RNA polymerase from *Escherichia coli*. *Arch. Biochem. Biophys.*, 246 (1986) 564-571.
1242 Zhao, C. and Si, S.: (Preliminary study on chemical constituents of earthworm Daping II). *Zhongyao Tongbao*, 11 (1986) 296-297; *C.A.*, 105 (1986) 49144a.

See also 1067, 1255.

21c. Nucleic acids, DNA

See 1067.

22. ALKALOIDS

1243 Cai, B., Mu, F., Li, W., Jin, J. and Zhong, J.: (New technology for extraction of Quinjiao alkaloids). *Zhongcaoyao*, 17, No. 3 (1986) 111-112; *C.A.*, 105 (1986) 11901g.
1244 Elaev, N.R., Evdokimov, L.D. and Ryzhakov, A.V.: (Alkaloid-inactivating enzymes of blood plasma). *Biokhimiya (Moscow)*, 51 (1986) 649-654.
1245 Grishina, M.S., Dyukova, V.V., Kovalenko, L.I. and Popov, D.M.: (Atropine and scopolamine assays in belladonna tincture). *Farmatsiya (Moscow)*, 35, No. 2 (1986) 24-27; *C.A.*, 104 (1986) 230558h.
1246 Liu, G., Wang, X. and Sun, Y.: (Paper chromatography for poison detection in legal medicine). *Hebei Yixueyuan Xuebao*, 6, No. 2 (1985) 84-86; *C.A.*, 105 (1986) 1765b.
1247 Petrishek, I.A., Zorin, E.B. and Lovkova, M.Ya.: (Methods of quantitative determination of tropane alkaloids in bulk and preparations of *Atropa belladonna* L.). *Khim.-Farm. Zh.*, 20 (1986) 579-583; *C.A.*, 105 (1986) 30135b - a review with 80 refs.
1248 Slepova, L.N.: (Determining codeine in medicinal mixtures). *U.S.S.R. Pat.* SU 1,223,095 (Cl. G01N21/78), 07 Apr. 1986, Appl. 3,779,915, 13 Aug. 1984; *C.A.*, 104 (1986) 230601s.
1249 Wang, J., Zhang, L., Gong, R. and Zhu, L.: (Preparation and identification of xianghuangsu). *Zhongcaoyao*, 17, No. 2 (1986) 4-5; *C.A.*, 104 (1986) 230374v.
1250 Tang, F., Yang, X. and Yang, G.: (Determination of berberine in *Coptis chinensis* by TLC-spectrophotometry). *Yaowu Fenxi Zashi*, 6, No. 2 (1986) 100-102; *C.A.*, 105 (1986) 49131u.

See also 1069, 1322.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23c. Indole derivatives

1251 Guo, Y. and Chen, F.: (TLC-UV spectrophotometric and TLC-scanning determination of isatin in leaf of *Isatis*). *Zhongcaoyao*, 17, No. 2 (1986) 8-11; *C.A.*, 104 (1986) 213068f.

1252 Pastore, T.C.M. and Limas, C.G.: Analytical investigation of some fluorogenic reactions of indol-3-yl acids with *o*-phthalaldehyde. Part II. Thin-layer chromatographic studies. *Analyst (London)*, 111 (1986) 707-710.
1253 Savinskii, S.V., Kofman, I.S., Il'yashuk, E.M. and Likholat, D.A.: (Quantitative determination of abscisic and indole-3-acetic acids using spectrodensitometric thin-layer chromatography). *Fiziol. Biokhim. Kul't. Rast.*, 18 (1986) 193-195; *C.A.*, 104 (1986) 203301n.

23d. Pyridine derivatives

See 1298.

23e. Other N-heterocyclic compounds

1254 Ansari, M.H. and Ahmad, M.: Synthesis of fatty 2-oxazolines from fatty methyl 2,3-epoxy ester. *J. Am. Oil Chem. Soc.*, 63 (1986) 908-914.
1255 De Bree, P.K., Wadman, S.K., Duran, M. and De Jonge, H.F.: Diagnosis of inherited adenylosuccinase deficiency by thin-layer chromatography of urinary imidazoles and by automated cation exchange column chromatography of purines. *Clin. Chim. Acta*, 156 (1986) 279-288.
1256 Okayasu, Y., Hamada, K. and Shimizu, H.: (2(1H)-Quinoline derivatives from rice bran for therapeutic use). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 01,666 (86 01,666) (Cl. CO7D215/54), 07 Jan. 1986, Appl. 84/123,083, 15 Jun. 1984; 5 pp.; *C.A.*, 105 (1986) 30036v.
1257 Park, D.L., Adams, W.N., Graham, S.L. and Jackson, R.C.: Variability of mouse bioassay for determination of paralytic shellfish poisoning toxins. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 547-550.

See also 1203.

24. ORGANIC SULPHUR COMPOUNDS

1258 Succar, S.D. and Catoggio, J.A.: (Behavior of thin layer chromatography of thiocarbamates. Correlations between R_M values and molecular structure). *An. Asoc. Quim. Argent.*, 73 (1985) 489-497; *C.A.*, 105 (1986) 17562u.

See also 1260, 1334.

25. ORGANIC PHOSPHORUS COMPOUNDS

1259 Di Renzo, M.F., Ferracini, R., Naldini, L., Giordano, S. and Comoglio, P.M.: Immunological detection of proteins phosphorylated at tyrosine in cells stimulated by growth factors or transformed by retroviral-oncogene-coded tyrosine kinases. *Eur. J. Biochem.*, 158 (1986) 383-391.

See also 1262.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26c. Coordination compounds

1260 Vuckovic, G., Juranic, N. and Celap, M.B.: New synthesis and thin-layer chromatography of tris(alkylxanthato)cobalt(III) complexes. *J. Chromatogr.*, 361 (1986) 217-221.

See also 1092, 1327, 1328, 1329, 1330.

27. VITAMINS AND VARIOUS GROWTH REGULATORS (NON-PEPTIDIC)

1261 Blanchin, M.D. and Fabre, H.: (Thin-layer chromatographic-reflectometric determination of vitamin B_{12} in pharmaceuticals). *Pharm. Acta Helv.*, 61 (1986) 139-141; *C.A.*, 105 (1986) 49146c.

1262 O'Fallon, J.V. and Chew, B.P.: Characterization of a retinylmonophosphatase in the plasma membrane of mouse brain. *Biochem. J.*, 237 (1986) 625-630.

28. ANTIBIOTICS

1263 Beijnen, J.H., Lingeman, H., van Munster, H.A. and Underberg, W.J.M.: Mitomycin antitumour agents: a review of their physico-chemical and analytical properties and stability. *J. Pharm. Biomed. Anal.*, 4 (1986) 275-295 - a review.

1264 Blomkvist, G.B., Jansson, K.M., Ryhage, E.R. and Osterdahl, B.-G.: Quantitative and qualitative analysis of monensin A sodium salt in the low-nanogram range by thin-layer chromatography and fast atom bombardment mass spectrometry. *J. Agric. Food Chem.*, 34 (1986) 274-276.

1265 Brown, M.A. and Rajan, S.: Maduramicin: rat metabolism of a highly potent polyether anticoccidial examined by carbon-13 NMR. *J. Agric. Food Chem.*, 34 (1986) 470-472.

1266 Dimenna, G.P., Walker, B.E., Turnbull, L.B. and Wright, G.J.: Thin-layer bioautographic assay for salinomycin in chicken liver. *J. Agric. Food Chem.*, 34 (1986) 472-474.

1267 Karkocha, I.: (Monensin determination in milk). *Roczn. Panstw. Zakl. Hig.*, 36 (1985) 310-312; *C.A.*, 105 (1986) 23192q.

1268 Kny, L. and Witte, P.: Quantitative DC von Gentamicin. *Pharmazie*, 41 (1986) 433.

1269 Nelson, R.A., Pope, J.A., Jr., Luedemann, G.M., McDaniel, L.E. and Schaffner, C.P.: Crisamicin A, a new antibiotic from *Micromonospora*. I. Taxonomy of the producing strain, fermentation, isolation, physico-chemical characterization and antimicrobial properties. *J. Antibiot.*, 39 (1986) 335-344.

1270 Schindler, P.W., König, W., Chatterjee, S. and Ganguli, B.N.: Improved screening for β-lactam antibiotics. A sensitive, high-throughput assay using DD-carboxypeptidase and a novel chromophore-labeled substrate. *J. Antibiot.*, 39 (1986) 53-57.

1271 Wallace, K.B.: Aglycosylation and disposition of doxorubicin in isolated rat liver nuclei and microsomes. *Drug Metab. Disp.*, 14 (1986) 399-404.

See also 1343.

29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS

29a. Chlorinated insecticides

1272 Matysik, G., Matyska, M. and Soczewinski, E.: (Analysis of pesticides from the chlorinated hydrocarbon group by thin-layer chromatography in "sandwich" chamber). *Bromatol. Chem. Toksykol.*, 18 (1985) 261-265; *C.A.*, 104 (1986) 202161e.

29b. Phosphorus insecticides

1273 Barakat, A.A., Fahmy, H.S.M. and Abdel-Ghany, A.T.M.: Thin-layer chromatographic method for Kitazin-P, Hinozan and their derivatives. *Indian J. Agric. Chem.*, 18, No. 1 (1985) 63-68; *C.A.*, 105 (1986) 19926q.

1274 Gorbacheva, N.A. and Orlova, A.M.: (Phoxim detection during forensic chemical analysis of biological material). *Farmatsiya (Moscow)*, 35, No. 3 (1986) 48-52; *C.A.*, 105 (1986) 36962r.

1275 Petrosyan, M.S. and Bunyatyan, Yu.A.: (Selecron determination in environmental objects). *Gig. Sanit.*, No. 3 (1986) 50-52; *C.A.*, 104 (1986) 201679t.

1276 Petrova, T.M. and Ostroukhova, O.K.: (Determination of some organophosphorus insecticides in green and dry tobacco leaves). *Tabak (Moscow)*, No. 1 (1986) 14-17; *C.A.*, 104 (1986) 204109t.
1277 Zhu, Z., Xu, K. and Liu, X.: (Determination of insecticide fume residues by TLC-EI (enzyme inhibition) techniques). *Huanjing Kexue Xuebao*, 5 (1985) 460-467; *C.A.*, 104 (1986) 202160d.

See also 1073.

29c. Carbamates

1278 Wang, Z. and Xie, N.: (Thin-layer chromatographic separation and residue determination of cartap, iso-cartap and their degradation products). *Sepu*, 4 (1986) 115-117; *C.A.*, 105 (1986) 20337e.

See also 1277.

29d. Herbicides

1279 Kovac, J., Zelenak, J., Kurucova, M. and Tekel, J.: (Determination of residues of urea herbicides and atrazine in wheat by a chromatographic method). *Agrochemia (Bratislava)*, 26 (1986) 115-118; *C.A.*, 105 (1986) 59516n.
1280 Lee, P.W., Stearns, S.M., Powell, W.R., Stoutamire, D.W., Payne, G.B., Woodward, M.D., Burton, W.B., Silveira, E.J. and Ehmann, A.: Metabolic fate of cinmethylin in rats. *J. Agric. Food Chem.*, 34 (1986) 162-170.

29e. Fungicides

1281 Vasileva-Aleksandrova, P., Kovacheva, E. and Neicheva, A.: (Thin-layer-chromatographic relations of water and pyridine solutions of preparations based on zinc and copper oxychloride, as supplied by the chemical factory Agria). *Nauchni Tr.-Vissh. Inst. Khranit. Vkusova Prom-st., Plovdiv*, 32 (1985) 289-295; *C.A.*, 105 (1986) 2094u.

29f. Other types of pesticides and various agrochemicals

See 1274.

30. SYNTHETIC AND NATURAL DYES

30a. Synthetic dyes

1282 Kamikura, M.: (Studies on subsidiary colors in synthetic food colors. II. Separation and determination of intermediates and side reaction products in Food Red No. 3 (erythrosine) and stabilities of side reaction products). *Shokuhin Eiseigaku Zasshi*, 26 (1985) 643-650; *C.A.*, 105 (1986) 23152b.
1283 Stotz, E., Schenk, E.A., Churukian, C. and Willis, C.: Oil red O: comparison of staining quality and chemical components as determined by thin layer chromatography. *Stain Technol.*, 61 (1986) 187-190; *C.A.*, 105 (1986) 38558n.

30b. Chloroplast and other natural pigments

1284 Minguez Mosquera, M.I. and Fernandez, J.G.: (Lipid removal during the extraction phase of chloroplast pigments in olive fruit (*Olea europaea*)). *Grasas Aceites (Seville)*, 36 (1985) 376-381; *C.A.*, 104 (1986) 205611n.
1285 Papageorgiou, V.P., Liakopoulou-Kyriakides, M. and Papadakis, C.: Quantitative determination of isohexenylnaphthazarin pigments by TLC densitometry. *Flavour Fragrance J.*, 1, No. 1 (1985) 21-24; *C.A.*, 105 (1986) 72m.
1286 Toennesen, H.H. and Karlsen, J.: Studies on curcumin and curcuminoids. VII. Chromatographic separation and quantitative analysis of curcumin and related compounds. *Z. Lebensm.-Unters. Forsch.*, 182 (1986) 215-218; *C.A.*, 105 (1986) 2947z.

See also 1342.

31. PLASTICS AND THEIR INTERMEDIATES

1287 Corti, P., Franchi, G., Lencioni, E. and Tocci, A.: (Determination by densitometry of some phthalic esters in PVC laminates; evaluation of their release into suppository masses). *Boll. Chim. Farm.*, 124 (1985) 535-545; *C.A.*, 104 (1986) 213209c.

1288 Johnson, J.F.: Chromatography. *Encycl. Polym. Sci. Eng.*, 3 (1985) 491-531; *C.A.*, 105 (1986) 43601a - a review with 73 refs.

1289 Krell, H.W. and Sandermann, H., Jr.: Metabolism of the persistent plasticizer chemical bis(2-ethylhexyl)phthalate in cell suspension cultures of wheat (*Triticum aestivum* L.). Discrepancy from the intact plant. *J. Agric. Food Chem.*, 34 (1986) 194-198.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

1290 Xie, P.: (Optimization in TLC). *Yaowu Fenxi Zazhi*, 6 (1986) 110-117; *C.A.*, 104 (1986) 221479f - a review with 25 refs.

32a. Synthetic drugs

1291 Beikin, S.G., Beikina, L.P., Sedov, A.I. and Kvasov, E.V.: (Identification of halidor and its quantitative determination by extraction-photometric methods). *Farm. Zh. (Kiev)*, No. 2 (1986) 74-75; *C.A.*, 105 (1986) 49162e.

1292 Bezakova, Z., Bachrata, M., Blesova, M. and Borovansky, A.: (Study of local anesthetics. LXXXIII. Stability of carbisocaine and pentacaine hydrochloride). *Farm. Obz.*, 55 (1986) 195-203; *C.A.*, 105 (1986) 48952a.

1293 Consuegra, S., Lukats, B. and Divina Marin, L.: (Study on the stability of injectable dipyrone). *Rev. Cubana Farm.*, 19 (1985) 192-201; *C.A.*, 105 (1986) 29936g.

1294 Dvoryantseva, G.G., Tetenchuk, K.P., Pol'shakov, V.I. and Elina, A. S.: (Photochemical reactions of biologically important N-oxides of quinoxalines). *Khim.-Farm. Zh.*, 20 (1986) 399-408; *C.A.*, 105 (1986) 29901s.

1295 Guenzi, A., Cappelletti, R., Esposito, R., Polidori, M. and Leonardi, A.: Analytical profile of REC 15-1884-2, a new compound with expectorant activity. *Boll. Chim. Farm.*, 124 (1985) 451-468; *C.A.*, 104 (1986) 213351t.

1296 Minchenkova, O.A., Uribe, V.D., Veksler, M. and Arzamastsev, A.P.: (Separation of nonsteroidal anti-inflammatory drug mixtures). *Khim.-Farm. Zh.*, 20 (1986) 623-628; *C.A.*, 105 (1986) 49170f.

1297 Navarro, J.N., Aznar, M.T., Ruiz, M.D., Monzo, M. and Pol, E.: (Stability of 5-fluorouracil in large-volume intravenous solutions). *Rev. Asoc. Esp. Farm. Hosp.*, 9, No. 2 (1985) 69-72; *C.A.*, 105 (1986) 11953a.

1298 Ohno, S., Komatsu, O., Mizukoshi, K., Ichihara, K., Nakamura, Y., Morishima, T. and Sumita, K.: Synthesis of asymmetric 4-aryl-1,4-dihydro-2,6-dimethyl-3,5-pyridinedicarboxylates with vasodilating and antihypertensive activities. *Chem. Pharm. Bull.*, 34 (1986) 1589-1606.

1299 Sanchez-Moyano, E., Herraez, M. and Pla-Delfina, J.M.: A contribution to the pharmaceutical analysis of benzodiazepines. *Pharm. Acta Helv.*, 61 (1986) 167-176; *C.A.*, 105 (1986) 30180n.

1300 Sanchez-Moyano, E., Pla-Delfina, J.M. and Herraez, M.: (Separation of six benzodiazepines by thin-layer chromatography with a pH gradient). *Cienc. Ind. Farm.*, 5, No. 4 (1986) 123-126; *C.A.*, 105 (1986) 49171g.

1301 Strelyuk, A.N.: (Detection of dipyridamole). *Farmatsiya (Moscow)*, 35, No. 3 (1986) 76-77; *C.A.*, 105 (1986) 49175m.

1302 Suzuki, S., Inoue, T. and Kashima, C.: Studies on 1-(2-phenethyl)-4-(N-propionylanilino)piperidine (Fentanyl) and related compounds. I. Spectrometric and chromatographic analyses of 3-methylfentanyl and α-methylfentanyl. *Chem. Pharm. Bull.*, 34 (1986) 1340-1343.

1303 Youssef, A.F., El-Shabouri, S.R., Mohamed, F.A. and Rageh, A.M.I.: Colorimetric determination of certain phenothiazine drugs by using morpholine and iodine-potassium iodide reagents. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 513-518.

See also 1069, 1072, 1073, 1102, 1120, 1240, 1338, 1343.

32b. Pharmacokinetic studies

1304 Brien, J.F., McLaughlin, B.E., Breedon, T.H., Bennett, B.M., Nakatsu, K. and Marks, G.S.: Biotransformation of glyceryl trinitrate occurs concurrently with relaxation of rabbit aorta. *J. Pharmacol. Exp. Ther.*, 237 (1986) 608-614.

1305 Elmarakby, S.A., Clark, A.M., Baker, J.K. and Hufford, C.D.: Microbial metabolism of bornaprine, 3-(diethylamino)propyl 2-phenylbicyclo[2.2.1]heptane-2-carboxylate. *J. Pharm. Sci.*, 75 (1986) 614-618.

1306 Hilbert, J.M., Ning, J., Symchowicz, S. and Zampaglione, N.: Placental transfer of quazepam in mice. *Drug Metab. Disp.*, 14 (1986) 310-312.

1307 King, S.-Y.P. and Fung, H.-L.: Pharmacokinetics of pentaerythritol tetranitrate following intra-arterial and oral dosing in the rat. *J. Pharm. Sci.*, 75 (1986) 247-250.

1308 Loh, A.C., Williams, T.H., Tilley, J.W., Sasso, G.J., Szuna, A.J., Carbone, J.J., Toome, V. and Leinweber, F.-J.: The metabolism of ^{14}C-cibenzoline in dogs and rats. *Drug Metab. Disp.*, 14 (1986) 325-330.

32c. Drug monitoring

1309 Martel, P.A., Adams, D., Jones, D.W. and O'Donnell, C.M.: Labetalol analysis with the TOXI-LAB^{R} A drug-detection system. *Clin. Chem. (Winston-Salem)*, 32 (1986) 915.

1310 Sistovaris, N.: Biomonitoring of xenobiotics by planar chromatography (thin-layer chromatography). *TrAC*, 5 (1986) 158-163 - a review with 12 refs.

32d. Toxicological applications

1311 Manno, B.R., Manno, J.E. and Dempsey, C.A.: A thin layer chromatographic method for high volume screening of urine for methylphenidate abuse. *J. Anal. Toxicol.*, 10 (1986) 116-119; *C.A.*, 105 (1986) 19957a.

1312 Mikolaeva, E.G.: (Isolation and detection of fluoracizine in biological material). *Sud.-Med. Ekspert.*, 29, No. 1 (1986) 42-43; *C.A.*, 104 (1986) 201698y.

1313 Stefanescu, E., Stan, T., Antonescu, V., Balalau, D., Bivol, E. and Tompa, F.: (Chemicotoxicological determination of some products with a benzodiazepine nucleus. Note 1.). *Farmacia (Bucharest)*, 33 (1985) 233-240; *C.A.*, 105 (1986) 176lx.

1314 Zharova, V.Ya. and Polyakova, V.N.: (Estimation of metisazone in organs and tissues of animals). *Veterinariya (Moscow)*, No. 3 (1986) 61-62; *C.A.*, 104 (1986) 220227k.

See also 1178, 1246, 1274.

32e. Plant extracts

1315 Bauer, R., Khan, I. and Wagner, H.: *Echinacea*-Drogen. Standardisierung mittels HPLC und DC. *Dtsch. Apoth.-Ztg.*, 126 (1986) 1065-1070.

1316 Chen, C.-C., Kuo, M.- C., Wu, C.-M. and Ho, C.-T.: Pungent compounds of ginger (*Zingiber officinale* Roscoe) extracted by liquid carbon dioxide. *J. Agric. Food Chem.*, 34 (1986) 477-480.

1317 Cheng, Z. and Fang, H.: (Quantitative determination of triptolide in common threewingnut (*Tripterygium wildfordii*) in different seasons and parts). *Zhongcaoyao*, 17, No. 2 (1986) 12-13; *C.A.*, 104 (1986) 230550z.

1318 Oomoto, T. and Koike, K.: (β-Carborines from *Ailanthus altissima*). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,132,984 (85,132,984) (Cl. C07D471/04), 16 Jul. 1985, Appl. 83/240,914, 22 Dec. 1983; 3 pp.; *C.A.*, 105 (1986) 49033p.

1319 Popescu, H.: (Thin-layer chromatography of spores and tinctures of *Lycopodium*). *Clujul Med.*, 58 (1985) 375-377; *C.A.*, 104 (1986) 213348x.

1320 Popov, D.M., Dyukova, V.V., Bakalova, M.V. and Berashvili, D.T.: (Quality control of valerian preparations by photocolorimetry). *Khim.-Farm. Zh.*, 20 (1986) 464-467; *C.A.*, 105 (1986) 12207x.

1321 Prosek, M., Steblaj, M., Medja, A. and Pukl, M.: Quantitative HPTLC of a Great Scarlet Poppy. *Int. Lab.*, 16, No. 5 (1986) 74-77.

1322 Van Beek, T.A. and Verpoorte, R.: Pharmacognostical studies of *Tabernaemontana* species. Part 13. Phytochemical investigation of *Tabernaemontana undulata*. *Fitoterapia*, 56 (1985) 304-307; *C.A.*, 104 (1986) 213084h.

See also 1081, 1087, 1091, 1163, 1198.

32f. Clinico-chemical applications and profiling body fluids

1323 Deyl, Z. and Sweeley, C.C.: Editorial. (*Profiling of Body Fluids and Tissues.*) *J. Chromatogr.*, 379 (1986) 1-2.
1324 Holland, J.F., Leary, J.J. and Sweeley, C.C.: Advanced instrumentation and strategies for metabolic profiling. *J. Chromatogr.*, 379 (1986) 3-26 - a review.

See also 1096, 1109, 1114, 1115, 1142, 1145, 1147, 1152, 1171, 1179, 1185, 1204, 1210, 1255.

33. INORGANIC COMPOUNDS

33a. Cations

1325 Hsu, Z.F., Jia, X.P. and Hu, C.S.: Simultaneous determination of light rare earths in monazite sand by densitometry on thin-layer chromatograms. *Talanta*, 33 (1986) 455-457; *C.A.*, 105 (1986) 53714d.
1326 Liu, J., Yan, Z., Liu, L. and Cheng, J.: (Thin-layer chromatographic study of high-valent metal ions on crystalline antimonic(V) acid-*p*-sulfochlorophosphonazo-impregnated thin-layer plate (II)). *Wuhan Daxue Xuebao, Ziran Kexueban 1985, (Anal. Chem. Spec. Ed.)*, 9-15; *C.A.*, 104 (1986) 218188e.
1327 Rao, A.L.J. and Chopra, S.: TLC studies of some metal complexes. *J. Inst. Chem. (India)*, 57 (1985) 197-199; *C.A.*, 104 (1986) 236342e.
1328 Ravindhranath, K. and Janardhan, P.B.: Chromatographic separation of manganese(II) and manganese(III). *Indian J. Chem., Sect. A*, 25A (1986) 405-407; *C.A.*, 105 (1986) 17305n.
1329 Schuster, M.: Zur Chromatographie von Metallchelaten. XVI. Dünnschicht-Chromatographie von N,N-Dialkyl-N'-thiobenzoylthioharnstoff-Chelaten. *Fresenius' Z. Anal. Chem.*, 324 (1986) 127-129.
1330 Timerbaev, A.R., Petrukhin, O.M. and Zolotov, Yu.A.: (Extraction-chromatographic determination of metal in water). *Zh. Anal. Khim.*, 41 (1986) 242-250; *C.A.*, 104 (1986) 236369u.
1331 Watanuki, K.: (Qualitative inorganic analysis: spot test, chromatography). *Bunseki*, No. 3 (1986) 140-146; *C.A.*, 104 (1986) 236256e - a review.
1332 Zong, W., Jia, X. and Zeng, J.: (Determination of lanthanum, cerium, praseodymium and neodymium in monazite sand by thin-layer chromatography). *Sepu*, 4, No. 1 (1986) 105-107; *C.A.*, 105 (1986) 17409z.

See also 1260.

33b. Anions

1333 De Meis, L., Behrens, M.I., Celis, H., Romero, I., Gomez Puyou, M.T. and Gomez Puyou, A.: Orthophosphate-pyrophosphate exchange catalyzed by soluble and membrane-bound inorganic pyrophosphatases. Role of H^+ gradient. *Eur. J. Biochem.*, 158 (1986) 149-157.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

1334 Franc, J.: (Determination of naphthalenesulfonic acids in the presence of nitronaphthalenesulfonic acids). *Czech. Pat.* CS 219,824 (Cl. G01N31/08), 15 Oct. 1985, Appl. 81/1,580, 05 Mar. 1981; 3 pp.; *C.A.*, 104 (1986) 218422b.

1335 Koga, Y.: (Correction method for the radioactivity measurement of doubly-labeled phospholipids separated on silica gel thin-layer plates). *J. UOEH*, 8, No. 1 (1986) 35-38; *C.A.*, 105 (1986) 57265f.

See also 1172.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35a. Surfactants

1336 Saheki, Y., Negoro, K. and Sasaki, T.: Synthesis of 2-alkyloyl-1,4,3,6-dianhydrosorbitol-5-sulfates and evaluation of the surface active properties. *J. Am. Oil Chem. Soc.*, 63 (1986) 927-930.
1337 Tanaka, F.S., Wien, R.G. and Hoffer, B.L.: Photosensitized degradation of a homogeneous nonionic surfactant: hexaethoxylated 2,6,8-trimethyl-4-nonanol. *J. Agric. Food Chem.*, 34 (1986) 547-551.
1338 Yamaoka, K., Nakajima, K., Moriyama, H., Saito, Y. and Sato, T.: Determination of sodium dodecyl sulfate in hydrophilic iontments by thin-layer chromatography with flame ionization detection. *J. Pharm. Sci.*, 75 (1986) 606-607.

See also 1196.

35b. Antioxidants and preservatives

1339 Gotz, M. and Boldvai, J.: (Comparative evaluation of analytical methods for preservatives. Some physicochemical characteristics of *methyl para-hydroxy*-benzoate). *Gyogyszereszet*, 30, No. 4 (1986) 127-131; *C.A.*, 105 (1986) 11943x.
1340 Novitskaya, L.P. and Kazarinov, N.F.: (Determination of products of the conversion of phenolic inhibitors forming in rubbers). *Kauch. Rezina*, No. 1 (1986) 37-40; *C.A.*, 105 (1986) 7717j.
1341 Sano, M., Abe, M., Yoshino, K., Matsuura, T., Sekino, T., Saito, S.-i. and Tomina, I.: A simple and convenient method to determine the activities of antioxidants using α-methylindole reagent and high-performance thin-layer chromatography. *Chem. Pharm. Bull.*, 34 (1986) 174-178.

See also 1069.

35c. Food analysis

1342 Aczel, A.: Application of overpressured layer chromatography in red pepper analysis. Study of the carotenoids responsible for the red color in ground red pepper. *J. High Resolut. Chromatogr. Chromatogr. Commun.*, 9 (1986) 407-408.
1343 Clark, C.M. and Crosby, N.T.: Analysis of veterinary residues in foods. *TrAC*, 5 (1986) 118-120 - a review with 13 refs.
1344 Yamamoto, M., Ishikawa, M., Masui, T., Nakazawa, H., Fujita, M. and Nakagomi, K.: (Study on the identification of *Aloe* material in foods containing *Aloe* by thin layer chromatography-densitometry). *Shokuhin Eiseigaku Zasshi*, 26 (1985) 600-604; *C.A.*, 104 (1986) 223717f.

See also 1077, 1082, 1084, 1267.

35d. Various technical products

See 1203.

35e. Compounds with distinct biological activity and diverse chemical nature

1345 Onodera, S., Yamashita, M., Ishikura, S. and Suzuki, S.: Chemical changes of organic compounds in chlorinated water. XI. Thin-layer chromatographic fractionation of Ames mutagenic compounds in chlorine-treated 4-methylphenol solution. *J. Chromatogr.*, 360 (1986) 137-150.

36. CELLS AND CELLULAR PARTICLES

1346 Brondz, I. and Olsen, I.: Microbial chemotaxonomy. Chromatography, electrophoresis and relevant profiling techniques. *J. Chromatogr.*, 379 (1986) 367-411 - a review.

37. ENVIRONMENTAL ANALYSIS

37c. Water pollution

1347 Lawerenz, A., Goralczyk, H. and Hermenau, H.: (Thin-layer chromatographic analysis of primary aromatic amines, chlorophenols, phenols, and some groups of herbicidal substances in water). *Acta Hydrochim. Hydrobiol.*, 14, No. 2 (1986) 121-133; *C.A.*, 104 (1986) 230131p.

See also 1330, 1345.

37d. Soil pollution

See 1076.

Electrophoresis

1. REVIEWS AND BOOKS

See 2129.

2. FUNDAMENTALS, THEORY AND GENERAL

2a. General

1815 Zhu, A. and Liu, J.: (High-efficiency zone electrophoresis). *Sepu*, 4 (1986) 26-30; *C.A.*, 105 (1986) 34872n.

2b. Thermodynamic and theoretical relationships

1816 Holloway, C.J. and Battersby, R.V.: New assay procedure for glutathione S-transferase using analytical capillary isotachophoresis: A procedure for the simultaneous analysis of reduced and oxidized glutathione together with glutathione conjugates of electrophilic compounds. *Electrophoresis (Weinheim)*, 7 (1986) 304-309.

See also 1828.

2d. Measurement of physico chemical and related values

1817 Hohmann, A., Lemon, J. and Nikoloutsopoulous, T.: A novel method for molecular weight determination in immunoblots. *Electrophoresis (Weinheim)*, 7 (1986) 389.

1818 Ibrahim-Granet, O., Delga, J.M., Granet, C. and Drouhet, E.: A program in BASIC for the determination of molecular weights and linear graphic representation of an electrophoretic protein pattern. Application to serotypes A and B of *Candida albicans* studied by polyacrylamide gel electrophoresis and immunoblotting. *Electrophoresis (Weinheim)*, 7 (1986) 316-323.

3. GENERAL TECHNIQUES

3a. Apparatus and accessories

1819 Harada, Y., Kanbara, H., Shimada, T., Nagai, K. and Tokita, J.: (Electrophoresis apparatus). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 03,045 (86 03,045) (Cl. G01 N27/26), 09 Jan. 1986, Appl. 84/123,607, 18 Jun. 1984; 4 pp.; *C.A.*, 104 (1986) 231258x.

1820 Tokito, J., Kanbara, H., Okada, O. and Shimada, T.: (Electrophoresis apparatus). *Jpn. Kokai Tokkyo Koho Pat.* 61 03,046 (86 03,046) (Cl. G01N27/26), 09 Jan. 1986, Appl. 84/123,704, 18 Jun. 1984; 4 pp.; *C.A.*, 104 (1986) 231259y.

See also 1827, 2118.

3b. Detection procedures and detectors

1821 Selsted, M.E. and Becker, H.W.: Eosin Y: A reversible stain for detecting electrophoretically resolved protein. *Anal. Biochem.*, 155 (1986) 270-274.

See also 1875, 1878, 1879, 1882, 2009, 2129.

3c. Electrophoresis in stabilized media

1822 Ermolenko, I.N., Kaputskii, F.N., Lazareva, T.G., Grinshpan, D.D., Savitskaya, T.A. and Borisenko, E.M.: (Hydrated cellulose-based support for membrane electrophoresis). *Zh. Anal. Khim.*, 14 (1986) 233-235; *C.A.*, 104 (1986) 236330z.

1823 Mullon, C.J.P., Mason, N.S. and Sparks, R.E.: Zonal density gradient electrophoresis of serum albumin and bacteriophages M13, ØX174, and MS2. Electrophoretic mobility measurement. *Separ. Sci.*, 21 (1986) 187-207.

1824 Ogawa, M. and Shiraishi, H.: Medium for electrophoresis. *Eur. Pat.* Appl. EP 163,472 (Cl. G01N27/26), 04 Dec. 1985, JP Appl. 84/100,261, 18 May 1984, 22 pp.; *C.A.*, 105 (1986) 21303c.

1825 Ogawa, M. and Shiraishi, H.: (Media for electrophoresis). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,243,550 (85,243,550) (Cl. G01N27/26), 03 Dec. 1985, Appl. 84/100,260, 18 May 1984, 10 pp.; *C.A.*, 105 (1986) 3080y.

See also 2118.

4. SPECIAL TECHNIQUES

4c. Isoelectric focusing

1826 Rovida, E., Gelfi, C., Morelli, A. and Righeta, G.: Conductivity, buffering capacity, concentration and pH profiles of carrier ampholytes focused in narrow-range immobilized pH gradients. *J. Chromatogr.*, 363 (1986) 159-171.

See also 1869, 1871, 1913, 1949, 1998.

4d. Isotachophoresis

1827 Deml, M., Bocek, P. and Janak, J.: (Equipment for isotachophoretic analysis of substances). *Czech. Pat.* CS 199,492 (Cl. G01N31/08), 31 Jul. 1980, Appl. 78/7,562, 21 Nov. 1978; 4 pp.; *C.A.*, 105 (1986) 17452h.

1828 Shimao, K.: Mathematical simulation of isotachophoresis boundary between protein and weak acid. *Electrophoresis (Weinheim)*, 7 (1986) 297-303.

See also 1867, 1869, 2113, 2116, 2119-2121.

4e. Two dimensional electrophoresis

1829 Anderson, N.L. and Garrels, J.: Conclusions of the Heidelberg meeting on computer analysis of two-dimensional protein maps. *Electrophoresis (Weinheim)*, 7 (1986) 295-296.

1830 Vincens, P.: HERMES: A second generation approach to the automatic analysis of two-dimensional electrophoresis gels. Part II. Spot detection and integration. *Electrophoresis (Weinheim)*, 7 (1986) 357-367.

1831 Vincens, P., Paris, N., Pujol, J.-L., Gaboriaud, C., Rabilloud, T., Pennetier, J.-L., Matherat, P. and Tarroux, P.: HERMeS: A second generation approach to the automatic analysis of two-dimensional electrophoresis gels. Part I. Data acquisition. *Electrophoresis (Weinheim)*, 7 (1986) 347-356.

See also 1871, 1873, 1887, 1902, 1923, 1931, 1951, 1957, 1965.

4f. Affinity electrophoresis

1832 Mackiewicz, A., Wiktorowicz, K. and Mackiewicz, S.: Lectin inhibition system for determination of concanavalin A glycoprotein complexes dissociation constants in agarose affinity electrophoresis. *Arch. Immunol. Ther. Exp.*, 33 (1985) 703-713; *C.A.*, 105 (1986) 3016g.

4g. Other special techniques

1833 Fujiwara, S. and Honda, S.: Determination of cinnamic acid and its analogues by electrophoresis in a fused silica capillary tube. *Anal. Chem.*, 58 (1986) 1811-1814.

1834 Parekh, N.J.: Electrophoresis of weak acids and bases in a non aqueous solvent. *Avail. Univ. Microfilms Int.*, DA 8519654 (1985) 161 p.; *C.A.*, 105 (1986) 34862j.

See also 1830, 1831, 1849.

10. CARBOHYDRATES

10a. Mono and oligosaccharides. Structural studies

See 1842.

10b. Polysaccharides, mucopolysaccharides, lipopolysaccharides

1835 Blumenfeld, O.O., Adamany, A.M., Kikuchi, M., Sabo, B. and McCreary, J.: Membrane glycophorins in St^a blood group erythrocytes. *J. Biol. Chem.*, 261 (1986) 5544-5552.

1836 Burcham, T.S., Osuga, D.T., Rao, B.N.N., Bush, C.A. and Feeney, R.E.: Purification and primary sequences of the major arginine-containing antifreeze glycopeptides from the fish *Eleginus gracilis*. *J. Biol. Chem.*, 261 (1986) 6384-6389.

1837 Funae, Y., Wada, S., Imaoka, S., Hirotsune, S., Tominaga, M., Tanaka, S., Kishimoto, T. and Maekawa, M.: Chromatographic separation of α_1-acid glycoprotein from α_1-antitrypsin by high-performance liquid chromatography using a hydroxyapatite column. *J. Chromatogr.*, 381 (1986) 149-152.

1838 Gendler, S.J. and Tőkes, Z.A.: Expression of an active proteinase inhibitor, α_1-antichymotrypsin, by human breast epithelial cells. *Biochim. Biophys. Acta*, 882 (1986) 242-253.

1839 Goodyer, P.R., Mills, M. and Kaplan, B.S.: Analysis of the Heymann nephritogenic glycoprotein in rat, mouse, and human kidney. *Biochem. Cell Biol.*, 64 (1986) 441-447.

1840 King, I.A., Tabiowo, A. and Pope, F.M.: A lectin-binding glycoprotein of M_r 135 000 associated with basal keratinocytes in pig epidermis. *Biochem. J.*, 237 (1986) 405-414.

1841 Min, H. and Cowman, M.K.: Combined alcian blue and silver staining of glycosaminoglycans in polyacrylamide gels: application to electrophoretic analysis of molecular weight distribution. *Anal. Biochem.*, 155 (1986) 275-285.

1842 Ohishi, H., Binett, J.P. and Schmid, K.: Myocardial chondroitin sulfates D and E in a case of acute carbon monoxide poisoning. *Clin. Chim. Acta*, 156 (1986) 157-164.

1843 Shashoua, V.E., Daniel, P.F., Moore, M.E. and Jungalwala, F.B.: Demonstration of glucuronic acid on brain glycoproteins which react with HNK-1 antibody. *Biochem. Biophys. Res. Commun.*, 138 (1986) 902-909.

1844 Stubbs, M.E., Carver, J.P. and Dunn, R.J.: Production of pea lectin in *Escherichia coli*. *J. Biol. Chem.*, 261 (1986) 6141-6144.

1845 Wantyghem, J., Goulut, C., Frenoy, J.-P., Turpin, E. and Goussault, Y.: Purification and characterization of *Robinia pseudoacacia* seed lectins. A reinvestigation. *Biochem. J.*, 237 (1986) 483-489.

See also 1935, 1965.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

See 1833.

11c. Lipids and their constituents

1846 Helander, I.M.: Isolation and electrophoretic analysis of bacterial lipopolysaccharides. *FEMS Symp.*, 25 (Enterobact. Surf. Antigens) (1985) 263-274; *C.A.*, 105 (1986) 21090f.

11d. Lipoproteins and their constituents

1847 Chino, H. and Yazawa, M.: Apolipophorin III in locusts: purification and characterization. *J. Lipid Res.*, 27 (1986) 377-385.

1848 Dumon, M.-F. and Clerc, M.: Preliminary report on a case of apolipoproteins CI and CII deficiency. *Clin. Chim. Acta*, 157 (1986) 239-248.

1849 Ehnholm, C., Lukka, M., Kuusi, T., Nikkilä, E. and Ytermann, G.: Apolipoprotein E polymorphism in the Finnish population: gene frequencies and relation to lipoprotein concentrations. *J. Lipid Res.*, 27 (1986) 227-235.

1850 Eklund, A. and Sjöblom, L.: Improved banding pattern of rat plasma lipoproteins developed by agarose gel electrophoresis at pH 7.0. *Biochim. Biophys. Acta*, 877 (1986) 135-140.

1851 Funke, H., Rust, S. and Assmann, G.: Detection of apolipoprotein E variants by an oligonucleotide "melting" procedure. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1285-1289.

1852 Gabelli, C., Gregg, R.E., Zech, L.A., Manzato, E. and Brewer, H.B., Jr.: Abnoraml low density lipoprotein metabolism in apolipoprotein E deficiency. *J. Lipid Res.*, 27 (1986) 326-333.

1853 Gabelli, C., Stark, D.G., Gregg, R.E. and Brewer, H.B., Jr.: Separation of apolipoprotein B species by agarose-acrylamide gel electrophoresis. *J. Lipid Res.*, 27 (1986) 457-460.

1854 Hardman, D.A., Gustafson, A., Schilling, J.W., Donaldson, V.H. and Kane, J.P.: Scission of human apolipoprotein B-100 by kallikrein: characterization of the cleavage site. *Biochem. Biophys. Res. Commun.*, 137 (1986) 821-825.

1855 Homquist, L. and Vesterberg, O.: Quantification of human serum apolipoprotein A-I by zone immunoelectrophoresis assay and a procedure for the preparation of an A-I standard. *Clin. Chim. Acta*, 156 (1986) 131-144.

1856 Johnson, F.L., Babiak, J. and Rudel, L.L.: High density lipoprotein accumulation in perfusates of isolated livers of African green monkeys. Effects of saturated versus polyunsaturated dietary fat. *J. Lipid Res.*, 27 (1986) 537-548.

1857 Kushwaha, R.S., Barnwell, G.M., Carey, K.D. and McGill, H.C., Jr.: Metabolism of apoprotein B in selectively bred baboons with low and high levels of low density lipoproteins. *J. Lipid Res.*, 27 (1986) 497-507.

1858 McLeod, R., Lacko, A.G., Pritchard, P.H. and Frohlich, J.: Purification of biologically active apolipoproteins by chromatofocusing. *J. Chromatogr.*, 381 (1986) 271-283.

1859 Peynet, J., Feneant-Thibault, M., Legrand, A., Marot, D., Rousselet, F. and Lemonnier, A.: Isolation and characterization of an abnormal alpha slow-moving high-density lipoprotein subfraction in serum from children with long-standing cholestasis. *Clin. Chem. (Winston-Salem)*, 32 (1986) 646-651.

1860 Rall, S.C., Jr., Weisgraber, K.H., Mahley, R.W., Ehnholm, C., Schaumaun, O., Olaisen, B., Blomhoff, J.P. and Teisberg, P.: Identification of homozygosity for a human apolipoprotein A-I variant. *J. Lipid Res.*, 27 (1986) 436-441.

1861 Thrift, R.N., Forte, T.M., Cahoon, B.E. and Shore, V.G.: Characterization of lipoproteins produced by the human liver cell line, Hep G_2, under defined conditions. *J. Lipid Res.*, 27 (1986) 236-250.

1862 Velours, J. and Guerin, B.: Localisation of the hydrophilic C terminal part of the ATP synthase subunit 8 of *Saccharomyces cerevisiae*. *Biochem. Biophys. Res. Commun.*, 138 (1986) 78-86.

1863 Walsh, M.T. and Atkinson, D.: Physical properties of apoprotein B in mixed micelles with sodium doexycholate and in a vesicle with dimyristoyl phosphatidylcholine. *J. Lipid Res.*, 27 (1986) 316-325.

1864 Weech, P.K., Camato, R., Milne, R.W. and Marcel, Y.L.: Apolipoprotein D and cross-reacting human plasma apolipoproteins identified using monoclonal antibodies. *J. Biol. Chem.*, 261 (1986) 7941-7951.

13. STEROIDS

13a. Pregnane and androstane derivatives

1865 Djuric, Z. and Jovanovic, M.: Effect of sodium lauryl sulphate on the electrophoretic mobility of hydrocortisone acetate. *Acta Pol. Pharm.*, 42 (1985) 389-395; *C.A.*, 105 (1986) 11951y.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

17a. Amines and polyamines

See 2120.

18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

18a. Amino acids and their derivatives

1866 Edwards, P.A., Lan, S.F. and Fogelman, A.M.: The effect of glucagon on the synthesis and degradation of 3-hydroxy-3-methyl-glutaryl coenzyme A reductase. *J. Lipid Res.*, 27 (1986) 398-403.

1867 Vinjamoori, D.V. and Schisla, R.M.: Rapid method for determination of 2-hydroxy-4(methylthio)butanoic acid in poultary feeds by capillary isotachophoresis. *J. Assoc. Off. Anal. Chem.*, 69 (1986) 474-477.

18b. Peptides and peptidic and proteinous hormones

1868 Brewer, S.J., Dickerson, C.H., Ewbank, J. and Fallon, A.: Large scale high-performance liquid chromatography of urogastrone produced by recombinant DNA technology. *J. Chromatogr.*, 362 (1986) 443-449.

1869 Hallin, P. and Renlund, S.: Evaluation of several strategies for preparing a bovine gonadotropin-like peptide using isotachophoresis, isoelectrofocusing and high-performance liquid chromatography. *J. Chromatogr.*, 363 (1986) 251-260.

1870 Lee, K.-O., Gesundheit, N., Chen, H.-C. and Weintraub, B.D.: Enzymatic deglycosylation of thyroid-stimulating hormone with peptide N-glycosidase F and endo-β-N-acetylglucosaminidase F. *Biochem. Biophys. Res. Commun.*, 138 (1986) 230-237.

1871 Marshall, T.: A comparison of glycerol and aqueous methanol equilibration for increased resolution during two-dimensional electrophoresis. *Separ. Sci.*, 21 (1986) 433-437.

See also 1969, 2019, 2042.

18c. General techniques of elucidation of structure of proteins

1872 Csabina, S., Mougios, V., Barany, M. and Barany, K.: Characterization of the phosphorylatable myosin light chain in rat uterus. *Biochim. Biophys. Acta*, 871 (1986) 311-315.

See also 1910.

19. PROTEINS

19a. General techniques

1873 Bloemendal, H. and Jansen, K.: Analysis of polymeric proteins by two-dimensional polyacrylamide gel electrophoresis on one slab in the presence and absence of sodium dodecyl sulfate. *Electrophoresis (Weinheim)*, 7 (1986) 387-388.

1874 Doman, M. and Geusendam, G.: (Immunofixation-electrophoresis. An efficient method for identifying monoclonal proteins). *Labor. Med.*, 9 (1986) 149-152; *C.A.*, 105 (1986) 4710r.

1875 Gersten, D.M., Wolf, P.H., Ledley, R.S., Rodriquez, L.V. and Zapolski, E.J.: On the relationship of amino acid composition to silver staining of proteins in electrophoresis gels. *Electrophoresis (Weinheim)*, 7 (1986) 327-332.

1876 Hultin, T.: A class of cleavable heterobifunctional reagents for thiol-directed high-efficiency protein cross-linking: synthesis and application to the analysis of protein contact sites in mammalian ribosomes. *Anal. Biochem.*, 155 (1986) 262-269.

1877 Lambin, P., Herance, N. and Fine, J.-M.: Decrease in the mobility of proteins during electrophoresis in linear gradients of polyacrylamide. *Electrophoresis (Weinheim)*, 7 (1986) 342-344.

1878 Righetti, P.G., Casero, P. and Del Campo, G.B.: Gold staining in cellulose acetate membranes. *Clin. Chim. Acta*, 157 (1986) 167-174.

1879 Wagener, C., Neumaier, M. and Fenger, U.: Sensitive detection of biotin-labeled proteins in western blots. *Fresenius' Z. Anal. Chem.*, 324 (1986) 263-264.

1880 Wilchek, M., Ben-Hur, H. and Bayer, E.A.: *p*-Diazobenzoyl-biocytin - a new biotinylating reagent for the labeling of tyrosines and histidines in proteins. *Biochem. Biophys. Res. Commun.*, 138 (1986) 872-879.

1881 Yoneyama, S.: (Amphoteric substances as carriers for electrophoretic separation of proteins and other substances based on their isoelectric points). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,239,448 (85,239,448) (Cl. C07C101/02), 28 Nov. 1985, Appl. 84/95,268, 11 May 1984, 6 pp.; *C.A.*, 105 (1986) 21319n.

1882 Yusupov, M.Y., Kopitsa, T.P., Burichenko, V.K., Skrebtsova, N.V. and Alikhodjaev, A.Kh.: Heterocyclic azo-compounds - new stain reagent for proteins. *Fresenius' Z. Anal. Chem.*, 324 (1986) 263.

19b. Proteins of cells, viruses and subcellular particles (excluding blood cells and platelets)

1883 Alric, M., Cheyvialle, D. and Renaud, M.: Cross-blot and cross-dot system: a high-performance system for the detection of antigen-antibody complexes on nitrocellulose. *Anal. Biochem.*, 155 (1986) 328-334.

1884 Boulikas, T.: Nucleosomes are assembled into discrete size structures by histone H1 *in vitro*. *Biochem. Cell Biol.*, 64 (1986) 463-473.

1885 Caillet-Boudin, M.L. and Lemay, P.: Influence of the state of denaturation on the migration of adenovirus type 2 structural proteins in sodium dodecyl sulfate polyacrylamide gels. *Electrophoresis (Weinheim)*, 7 (1986) 309-315.

1886 Csejtey, J. and Boosman, A.: Purification of human macrophage Colony Stimulating Factor (CSF-1) from medium conditioned by pancreatic carcinoma cells. *Biochem. Biophys. Res. Commun.*, 138 (1986) 238-245.

1887 Knowles, A.F.: Endogenous phosphorylation of proteins and phosphatidylinositol in the plasma membranes of a human astrocytoma. *Arch. Biochem. Biophys.*, 249 (1986) 76-87.

1888 Köster, A., Heisig, M., Heinrich, P.C. and Just, W.W.: *In vitro* synthesis of peroxisomal membrane polypeptides. *Biochem. Biophys. Res. Commun.*, 137 (1986) 626-632.

1889 Lehotsky, J. Kaplan, P., Mezesova, V. and Mezes, V.: (Preparative electrophoresis of membrane proteins of the sarcotubular fraction of rabbit skeletal muscle). *Bratisl. Lek. Listy*, 84 (1985) 693-700; *C.A.*, 105 (1986) 21231c.

1890 Lewis, M.J., Mazzarella, R.A. and Green, M.: Structure and assembly of the endoplasmic reticulum: biosynthesis and intracellular sorting of ERp61, ERp59 and ERp49, three protein components of murine endoplasmic reticulum. *Arch. Biochem. Biophys.*, 245 (1986) 389-403.

1891 Marsh, W. and Center, M.S.: Dimethylsulfoxide, retinoic acid and 12-O-tetradecanoylphorbol-13-acetate induce a selective decrease in the phosphorylation of P150, a surface membrane phosphoprotein of HL60 cells resistant to adriamycin. *Biochem. Biophys. Res. Commun.*, 138 (1986) 9-16.

1892 Nakaya, K., Shinkawa, K., Nakajo, S. and Nakamura, Y.: Phosphorylation of isolated plasma membranes of AH-66 hepatoma ascites cells by casein kinase 1. *Biochem. Biophys. Res. Commun.*, 138 (1986) 95-101.

1893 Shen, D., Cardarelli, C., Hwang, J., Cornwell, M., Richert, N., Ishii, S., Pastan, I. and Gottesman, M.M.: Multiple drug-resistant human KB carcinoma cells independently selected for high-level resistance to colchicine, adriamycin, or vinblastine show changes in expression of specific proteins. *J. Biol. Chem.*, 261 (1986) 7762-7770.

1894 Tanaka, M., Nishikimi, M., Suzuki, H., Ozawa, T., Okino, E. and Takahashi, H.: Multiple cytochrome deficiency and deteriorated mitochondrial polypeptide composition in fatal infantile mitochondrial myopathy and renal dysfunction. *Biochem. Biophys. Res. Commun.*, 137 (1986) 911-916.

1895 Threadgill, G.J., Conrad, R.C., Changchien, L.-M., Cannon, M. and Craven, G.R.: Application of high-performance liquid chromatography to the purification and characterization of ribisomal protein Ls from trichodermin-resistant yeast mutants. *Biochem. J.*, 237 (1986) 421-426.

See also 2019.

19c. Microbial and plant proteins

1896 Allen, J.F. and Findlay, J.B.C.: Amino acid composition of the 9 kDa phosphoprotein of pea thylakoids. *Biochem. Biophys. Res. Commun.*, 138 (1986) 146-152.

1897 Angulo, J.F., Schwencke, J., Fernandez, I. and Moustacchi, E.: Induction of polypeptides in *Saccharomyces cerevisiae* after ultraviolet irradiation. *Biochem. Biophys. Res. Commun.*, 138 (1986) 679-686.

1898 Davis, S.J. and Wheldrake, J.F.: Sulphation and the vegetative growth of *Dictyostelium discoideum*. *Eur. J. Biochem.*, 158 (1986) 179-185.

1899 Faye, L., Sturm, A., Bollini, R., Vitale, A. and Chrispeels, M.J.: The position of the oligosaccharide side-chains of phytohemagglutinin and their accessibility to glycosidases determines their subsequent processing in the Golgi. *Eur. J. Biochem.*, 158 (1986) 655-661.

1900 Gebre, H., Khan, K. and Foster, A.E.: Barley cultivar identification by polyacrylamide gel electrophoresis of hordein proteins: catalog of cultivars. *Crop Sci.*, 26 (1986) 454-460; *C.A.*, 105 (1986) 3589w.

1901 Lei, M.-G. and Reeck, G.R.: Combined use of trypsin-agarose affinity chromatography and reversed-phase high-performance liquid chromatography for the purification of single-chain protease inhibitor from corn seeds. *J. Chromatogr.*, 363 (1986) 315-321.

1902 Odintsova, T.I., Egorov, T.A. and Sozinov, A.A.: Isolation of wheat ω-gliadius, using chromatography on thiopropyl-Sepharose. *Biokhimiya (Moscow)*, 51 (1986) 1124-1131.

1903 Salomonsson, L. and Larsson-Raznikiewicz, M.: Methods for fractionation and characterization of proteins in wheat. Comparative studies. *Swed. J. Agric. Res.*, 15 (1985) 123-131; *C.A.*, 105 (1986) 3046s.

1904 Sekar, V.: Biochemical and immunological characterization of the cloned crystal toxin of *Bacillus thuringiensis* var. *israelensis*. *Biochem. Biophys. Res. Commun.*, 137 (1986) 748-751.

1905 Sessa, D.J. and Bietz, J.A.: Toasted soybean flour components with trypsin inhibitor activity. *J. Am. Oil Chem. Soc.*, 63 (1986) 784-788.

1906 Yatvin, M.B., Smith, K.M. and Siegel, F.L.: Translocation of nascent non-signal sequence proteins in heated *Escherichia coli*. *J. Biol. Chem.*, 261 (1986) 8070-8075.

See also 1895.

19d. Proteins of blood, serum and blood cells

1907 Baars, J.D. and Lombarts, A.J.P.F.: Imprecision of protein electrophoresis. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1425-1426.

1908 Brunauer, L.S. and Clarke, S.: Methylation of clamodulin at carbocyclic acid residues in erythrocytes. A non-regulatory covalent modification? *Biochem. J.*, 236 (1986) 811-820.
1909 Cohen, C.M. and Foley, S.F.: Phorbol ester- and Ca^{2+}-dependent phosphorylation of human red cell membrane skeletal proteins. *J. Biol. Chem.*, 261 (1986) 7701-7709.
1910 Folkersen, J., Teisner, B., Eggertsen, G. and Sim, R.B.: Immunoblotting analysis of the peptide chain structure of the physiological breakdown products of the third component of human complement. *Electrophoresis (Weinheim)*, 7 (1986) 379-386.
1911 Gastearena, J., Fernancez, F.J., Orue, M.T., Perez Equiza, E., Uriz, M.J. and Rocha, E.: IgD plasma cell leukemia associated with pyroglobulineamia and pyroglobinuria. *Clin. Chim. Acta*, 157 (1986) 133-142.
1912 Minnick, M.F., Rupp, R.A. and Spence, K.D.: A bacterial-induced lectin which triggers hemocyte coagulation in *Manduca sexta*. *Biochem. Biophys. Res. Commun.*, 137 (1986) 729-735.
1913 Schibeci, A., Wade, A.W., Depew, W.T. and Szewczuk, M.R.: Analysis of serum antibody repertoires by isoelectric focusing and capillary blotting onto nitrocellulose paper. *J. Immunol. Methods*, 89 (1986) 201-205; *C.A.*, 105 (1986) 22640x.
1914 Schreiber, W.E.: More on quantifying protein fractions after electrophoresis. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1432.
1915 Shackelford, D.A. and Trowbridge, I.S.: Identification of lymphocyte integral membrane proteins as substrates for protein kinase C. Phosphorylation of the interleukin-2 receptor, class I HLA antigens, and T200 glycoprotein. *J. Biol. Chem.*, 261 (1986) 8334-8341.
1916 Sudo, K., Maekawa, M., Watanabe, H., Matsumoto, K., Mori, Y., Sasaki, T. and Kanno, T.: A case of immunoglobulin G conjugated with lactate dehydrogenase, producing both loss of enzyme activity and an abnormal isoenzyme pattern. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1420-1422.
1917 Suzuki, Y. and Sinohara, H.: Isolation and characterization of α-macroglobulin from quinea pig plasma. *J. Biochem. (Tokyo)*, 99 (1986) 1655-1665.
1918 Suzuki, K., Matsui, K. and Matsumoto, H.: FXIIIA polymorphism in a Japanese population: Occurrence of FXIIIA 4 allele. *Electrophoresis (Weinheim)*, 7 (1986) 289-290.
1919 Tremethick, D.J. and Molloy, P.L.: High mobility group proteins 1 and 2 stimulate transcription *in vitro* by RNA polymerases II and III. *J. Biol. Chem.*, 261 (1986) 6986-6992.

See also 1823, 1855, 1979, 2122.

19e. Structural and muscle proteins

1920 Barylko, B., Tooth, P. and Kendrick-Jones, J.: Proteolytic fragmentation of brain myosin and localisation of the heavy-chain phosphorylation site. *Eur. J. Biochem.*, 158 (1986) 271-282.
1921 Betto, D.D., Zerbato, E. and Betto, R.: Type 1, 2A, and 2B myosin heavy chain electrophoretic analysis of rat muscle fibers. *Biochem. Biophys. Res. Commun.*, 138 (1986) 981-987.
1922 Cole, W.G., Chan, D., Chambers, G.W., Walker, I.D. and Bateman, J.F.: Deletion of 24 amino acids from the pro-α1(I) chain of type I procollagen in a patient with the Ehlers-Danlos syndrome type VII. *J. Biol. Chem.*, 261 (1986) 5496-5503.
1923 Currie, R.W.: Synthesis of stress-induced protein in isolated and perfused rat hearts. *Biochem. Cell Biol.*, 64 (1986) 418-426.
1924 De Vries, W.N. and de Wet, W.J.: The molecular defect in an autosomal dominant form of osteogenesis imperfecta. Synthesis of type I procollagen containing cysteine in the triple-helical domain of pro-α1(I) chains. *J. Biol. Chem.*, 261 (1986) 9056-9064.
1925 Gregory, P., Low, R.B. and Stirewalt, W.S.: Changes in skeletal-muscle myosin isoenzymes with hypertrophy and exercise. *Biochem. J.*, 238 (1986) 55-63.
1926 Hu, D.H., Kimura, S. and Maruyama, K.: Sodium dodecyl sulfate gel electrophoresis studies of connectin-like high molecular weight proteins of various types of vertebrate and invertebrate muscles. *J. Biochem. (Tokyo)*, 99 (1986) 1485-1492.

1927 Iwasa, T., Inoue, N., Fukunaga, K., Isobe, T., Okuyama, T. and Miyamoto, E.: Purification and characterization of a multifunctional calmodulin-dependent protein kinase from canine myocardial cytosol. *Arch. Biochem. Biophys.*, 248 (1986) 21-29.

1928 Jimenez, S.A., Rao, V.H., Reginato, A.M. and Yankowski, R.: Identification of a disulfide-bonded 70kD type X procollagen in embryonic chick sternum cartilage. *Biochem. Biophys. Res. Commun.*, 138 (1986) 835-841.

1929 Kapoor, R., Bornstein, P. and Sage, E.H.: Type VIII collagen from bovine Descement's membrane: structural characterization of a triple-helical domain. *Biochemistry*, 25 (1986) 3930-3937.

1930 Kohama, K., Takano-Ohmuro, H., Tanaka, T., Yamaguchi, Y. and Kohama, T.: Isolation and characterization of myosin from amoebae of *Physarum polycephalum*. *J. Biol. Chem.*, 261 (1986) 8022-8027.

1931 Kovalev, L.I., Shishkin, S.S., Ivolging, G.L., Gromov, P.S. and Shandala, A.M.: Detection of interlinear polymorphism of cardiac muscle proteins in mice by two-dimensional electrophoresis. *Biokhimiya (Moscow)*, 51 (1986) 986-908.

1932 Locker, R.H. and Wild, D.J.C.: A comparative study of high molecular weight proteins of various types of muscle across the animal kingdom. *J. Biochem. (Tokyo)*, 99 (1986) 1473-1484.

1933 Morris, N.P., Keene, D.R., Glanville, R.W., Bentz, H. and Burgesson, R.E.: The tissue form of type VII collagen is an antiparallel dimer. *J. Biol. Chem.*, 261 (1986) 5638-5644.

1934 Nag, A.C. and Cheng, M.: Biochemical evidence for cellular dedifferentiation in adult rat cardiac muscle cells in culture: expression of myosin isozymes. *Biochem. Biophys. Res. Commun.*, 137 (1986) 855-862.

1935 Oester, D.A., Caterson, B. and Schwartz, E.R.: The phosphorylation of human link proteins. *Biochem. Biophys. Res. Commun.*, 137 (1986) 599-605.

1936 Schmid, A., Barhanin, J., Coppola, T., Borsotto, M. and Lazdunski, M.: Immunochemical analysis of subunit structures of 1,4-dihydropyridine receptors associated with voltage-dependent Ca^{2+} channels in skeletal, cardiac, and smooth muscles. *Biochemistry*, 25 (1986) 3492-3495.

1937 Steinmann, B., Nicholls, A. and Pope, F.M.: Clinical variability of osteogenesis imperfecta reflecting molecular heterogeneity: cysteine substitutions in the α1(I) collagen chain producing lethal and mild forms. *J. Biol. Chem.*, 261 (1986) 8958-8964.

1938 Taniguchi, S., Kawano, T., Kakunaga, T. and Baba, T.: Differences in expression of a variant actin between low and high metastatic B16 melanoma. *J. Biol. Chem.*, 261 (1986) 6100-6106.

1939 Varga, J. and Jimenez, S.A.: Stimulation of normal human fibroblast collagen production and processing by transforming growth factor-β. *Biochem. Biophys. Res. Commun.*, 138 (1986) 974-980.

1940 Yasui, N., Benya, P.D. and Nimni, M.E.: Coordinate regulation of type IX and type II collagen synthesis during growth of chick chondrocytes in retinoic acid or 5-bromo-2'-deoxyuridine. *J. Biol. Chem.*, 261 (1986) 7997-8001.

See also 1889.

10f. Protamines, histones and other nuclear proteins

1941 Byvoet, P., Barber, M., Amidei, K., Lowell, N. and Trudeau, W.: Effect of exogenous histone H5 on integration of histone H1 in rat liver chromatin. Correlations with aberrant ε-N-methylation of histone H1. *Biochim. Biophys. Acta*, 867 (1986) 163-175.

1942 Macfarlane, D.E.: Phorbol diester-induced phosphorylation of nuclear matrix proteins in HL60 promyelocytes. Possible role in differentiation studied by cationic detergent gel electrophoresis systems. *J. Biol. Chem.*, 261 (1986) 6947-6953.

1943 Nose, K.: Characterization of nuclear matrix from cultured normal human fibroblasts. *J. Biochem. (Tokyo)*, 99 (1986) 1385-1391.

19g. Chromoproteins and metalloproteins

1944 Bandiera, S., Ryan, D.E., Levin, W. and Thomas, P.E.: Age- and sex-related expression of cytochromes P450f and P450g in rat liver. *Arch. Biochem. Biophys.*, 248 (1986) 658-676.
1945 Cham, B.E., Roeser, P., Nikles, A.C. and Ridgway, K.M.: Lipid associated tissue ferritin. *Clin. Chim. Acta*, 158 (1986) 71-79.
1946 Gutkina, N.I., Mishin, V.M. and Lyakhovich, V.V.: Induction of the PB-form of cytochrome P-450 by chemically unrelated compounds. *Biokhimiya (Moscow)*, 51 (1986) 1223-1229.
1947 Park, C.M., Nagel, R.L., Blumberg, W.E., Peisach, J. and Magliozzo, R.S.: Sulfhemoglobin. Properties of partially sulfurated tetramers. *J. Biol. Chem.*, 261 (1986) 8805-8810.
1948 Perrella, M., Sabbioneda, L., Samaja, M. and Rossi-Bernardi, L.: The intermediate compounds between human hemoglobin and carbon monoxide at equilibrium and during approach to equilibrium. *J. Biol. Chem.*, 261 (1986) 8391-8396.
1949 Righetti, P.G. and Cossu, G.: Detection of neutral hemoglobin mutants by conventional isoelectric focusing and immobilized pH gradients. *TrAC*, 5 (1986) 147-151.
1950 Van Eijk, H.G. and van Noort, W.L.: A non-random distribution of transferrin iron in fresh human sera. *Clin. Chim. Acta*, 157 (1986) 299-304.

See also 1908.

19h. Proteins of glands, gland products and various zymogens (including milk proteins)

1951 Boulikas, T.: Protein-protein and protein-DNA interaction in calf thymus nuclear matrix using cross-linking by ultraviolet irradiation. *Biochem. Cell Biol.*, 64 (1986) 474-484.
1952 Hallinan, F.M., Rose, M., Eagleton, M. and Tempany, E.: Electrophoretic characterisation of human parotid saliva protein fractions isolated by preparative isoelectric focusing. *Electrophoresis (Weinheim)*, 7 (1986) 333-339.
1953 Liberti, J.P. and Joshi, G.S.: Synthesis and secretion of phosphorylated growth hormone by rat pituitary glands *in vitro*. *Biochem. Biophys. Res. Commun.*, 137 (1986) 806-812.
1954 Mikami, K. and Strott, C.A.: Cyclic AMP-dependent protein kinase activity and protein phosphorylation in zones of the adrenal cortex. *Biochem. Biophys. Res. Commun.*, 138 (1986) 895-901.
1955 Paquette, J., Leblond, F.A., Beattie, M. and LeBel, D.: Reducing conditions induce a total degradation of the major zymogen granule membrane protein in both its membraneous and its soluble form. Immunochemical quantitation of the two forms. *Biochem. Cell Biol.*, 64 (1986) 456-462.

See also 1969.

19i. Proteins of neoplastic tissue

1956 Freenab, J.W., McRorie, D.K., Busch, R.K., Gyorkey, F., Gyorkey, P., Ross, B.E., Spohn, W.H. and Busch, H.: Identification and partial characterization of a nucleolar antigen with a molecular weight of 145,000 found in a broad range of human cancers. *Cancer Res.*, 46 (1986) 3593-3598.
1957 Griep, A., Kendrick, N.C. and DeLuca, H.F.: Modulation of protein biosynthesis during early stages of differentiation in retinoic acid treated F9 teratocarcinoma cells. *Arch. Biochem. Biophys.*, 249 (1986) 180-190.
1958 Guevara, J., Jr., Herbert, B.H., Raymond, A.K. and Batsakis, J.G.: Distinctive protein pattern in two-dimensional electrophoretograms of cancerous prostatic tissues. *Cancer Res.*, 46 (1986) 3599-3604.

See also 1893, 2019.

19j. Specific binding proteins

1959 Abdurashidova, G.G., Baskayeva, I.O., Chernyi, A.A., Kaminir, L.B. and Budowsky, E.I.: Structural characteristics and classification of some tRNA-binding sites of elongating *Escherichia coli* ribosome. *Eur. J. Biochem.*, 159 (1986) 103-109.

1960 Bentley, J.K., Garbers, D.L., Domino, S.E., Noland, T.D. and van Dop, C.: *Spermatozoa* contain a guanine nucleotide-binding protein ADP-ribosylated by pertussis toxin. *Biochem. Biophys. Res. Commun.*, 138 (1986) 728-734.

1961 Chandler, C.S. and Ballard, F.J.: Multiple biotin-containing proteins in 3T3-L1 cells. *Biochem. J.*, 237 (1986) 123-130.

1962 Collins, S. and Marletta, M.A.: Purification of a benzo[*a*]pyrene binding protein by affinity chromatography and photoaffinity labeling. *Biochemistry*, 25 (1986) 4322-4329.

1963 Gross, V., Tran-Thi, T.-A., Schwarz, R.T., Elbein, A.D., Decker, K. and Heinrich, P.C.: Different effects of the glucosidase inhibitors 1-deoxynojirimycin, N-methyl-1-deoxynojirimycin and castanospermine on the glycosylation of rat α_1-proteinase inhibitor and α_1-acid glycoprotein. *Biochem. J.*, 236 (1986) 853-860.

1964 Iwasa, F. and Ishiguro, K.: Calmodulin-binding protein (55K+17K) of sea urchin eggs has a Ca^{2+} - and calmodulin-dependent phosphoprotein phosphatase activity. *J. Biochem. (Tokyo)*, 99 (1986) 1353-1358.

1965 Limpaseni, T. and Chulavatnatol, M.: Purification and characterization of a steroid-binding sialoglycoprotein from rat ventral prostate. *Arch. Biochem. Biophys.*, 249 (1986) 154-163.

1966 Lobanenkov, V.V., Nicolas, R.H., Plumb, M.A., Wright, C.A. and Goodwin, G.H.: Sequence-specific DNA-binding proteins which interact with (G+C)-rich sequences flanking the chicken c-myc gene. *Eur. J. Biochem.*, 159 (1986) 181-188.

1967 Miribel, L., Goldschmidt-Clermont, P., Galbraith, R.M. and Arnaud, P.: Rapid purification of native group-specific component (vitamin D-binding protein) by differential affinity for immobilized triazine dyes. *J. Chromatogr.*, 363 (1986) 448-455.

1968 Napier, M.A., Arcuri, K.E. and Vandlen, R.L.: Binding and internalization of atrial natriuretic factor by high-affinity receptors in A 10 smooth muscle cells. *Arch. Biochem. Biophys.*, 248 (1986) 516-522.

1969 Norrman, B., Pohl, G., Jörnvall, H. and Wallen, P.: Proteolytically induced variations in the enzymatic properties of tissue plasminogen activator. Activations, inactivations and reactivations. *Eur. J. Biochem.*, 159 (1986) 7-13.

1970 Offner, G.D., Troxler, R.F. and Brecher, P.: Characterization of a fatty acid-binding protein from rat heart. *J. Biol. Chem.*, 261 (1986) 2284-2289.

1971 Poland, A., Glover, E., Hal Ebetino, F. and Kende, A.S.: Photoaffinity labeling of the Ah receptor. *J. Biol. Chem.*, 261 (1986) 6352-6365.

1972 Puri, R.K. and Toft, D.O.: Peptide mapping analysis of the avian progesterone receptor. *J. Biol. Chem.*, 261 (1986) 5651-5657.

1973 Ratnam, M., Guilick, W., Spiess, J., Wan, K., Criado, M. and Lindstrom, J.: Structural heterogeneity of the α subunits of the nicotinic acetylcholine receptor in relation to agonist affinity alkylation and antagonist binding. *Biochemistry*, 25 (1986) 4268-4275.

1974 Regan, J.W., Raymond, J.R., Lefkowitz, R.J. and DeMarinis, R.M.: Photoaffinity labeling of human platelet and rabbit kidney α_2-adrenoceptors with [^{3}H]SKF 102229. *Biochem. Biophys. Res. Commun.*, 137 (1986) 606-613.

1975 Rosenfeld, R.G., Hodges, D., Pham, H., Lee, P.D.K. and Powell, D.R.: Purification of the insulin-like growth factor II (IGF-II) receptor from an IGF-II-producing cell line, and generation of an antibody which both immunoprecipitates and blocks the type 2 IGF receptor. *Biochem. Biophys. Res. Commun.*, 138 (1986) 304-311.

1976 Rosenthal, W., Koesling, D., Rudolph, U., Kleuss, C., Pallast, M., Yajima, M. and Schultz, G.: Identification and characterization of the 35-kDa β subunit of guanine-nucleotide-binding proteins by an antiserum raised against transducin. *Eur. J. Biochem.*, 158 (1986) 255-263.

1977 Shchelkunova, T.A., Smirnov, A.N. and Rozen, V.B.: Physico-chemical properties and amino acid composition of a highly purified preparation of an unusual estrogen-binding protein from rat liver. *Biokhimiya (Moscow)*, 51 (1986) 958-966.

1978 Soprano, D.R., Soprano, K.J. and Goodman, De Witt, S.: Retinol-binding protein messenger RNA levels in the liver and in extrahepatic tissues of the rat. *J. Lipid Res.*, 27 (1986) 166-171.
1979 Stadel, J.M., Rebar, R., Shorr, R.G.L., Nambi, P. and Crooke, S.T.: Biochemical characterization of phosphorylated β-adrenergic receptors from catacholamine-desensitized turkey erythrocytes. *Biochemistry*, 25 (1986) 3719-3724.
1980 Sun, F.F., Chau, L., Spur, B., Corey, E.J., Lewis, R.A. and Austen, K.F.: Identification of a high affinity leukotriene C_4-binding protein in rat liver cytosol as glutathione S-transferase. *J. Biol. Chem.*, 261 (1986) 8540-8546.
1981 Van Patten, S.M., Fletcher, W.H. and Walsh, D.A.: The inhibitor protein of the cAMP-dependent protein kinase-catalytic subunit interaction. Parameters of complex formation. *J. Biol. Chem.*, 261 (1986) 5514-5523.
1982 Wang, S.-L., Rice, S.A., Serra, M.T. and Gross, B.: Purification and identification of rat hepatic cytosolic enzymes responsible for defluorination of methoxyflurane and fluoroacetate. *Drug. Metab. Disp.*, 14 (1986) 392-398.
1983 Whitfield, W.G.F., Fellows, G. and Turner, B.M.: Characterization of monoclonal antibodies to histone 2B. Localization of epitopes and analysis of binding to chromatin. *Eur. J. Biochem.*, 157 (1986) 513-521.
1984 Zhang, Z., Fournier, A. and Tan, Y.H.: The isolation of human β-interferon receptor by wheat germ lectin affinity and immunosorbent column chromatographies. *J. Biol. Chem.*, 261 (1986) 8017-8021.
1985 Zhou, H., Zhao, H. and Gu, T.: (Isolation and characterization of human placental transferrin receptor and its antiserum preparation). *Shanghai Yike Daxue Xuebao*, 13 (1986) 24-28; *C.A.*, 105 (1986) 21294a.

See also 1936, 1992.

19k. Urinary proteins

1986 Kshirsagar, B. and Wiggins, R.C.: A map of urine proteins based on one-dimensional SDS-polyacrylamide gel electrophoresis and Western blotting using one microliter of unconcentrated urine. *Clin. Chim. Acta*, 158 (1986) 13-22.

See also 1911.

19l. Other proteins

1987 Halduyck, M., Mizon, C., Loutfi, H., Richet, C., Roussel, P. and Mizon, J.: The major human urinary trypsin inhibitor is a proteoglycan. *Eur. J. Biochem.*, 158 (1986) 417-422.
1988 Farrell, D.H., van Nostrand, W.E. and Cunningham, D.D.: A simple two-step purification of protease nexin. *Biochem. J.*, 237 (1986) 907-912.
1989 Grundke-Iqbal, I., Oqbal, K., Quinlan, M., Tung, Y., Zaidi, M.S. and Wisniewski, H.M.: Microtubule-associated tau. A component of Alzheimer paired helical filaments. *J. Biol. Chem.*, 261 (1986) 6084-6089.
1990 Gschwendt, M., Kittstein, W. and Marks, F.: A novel type of phorbol ester-dependent protein phosphorylation in the particulate fraction of mouse epidermis. *Biochem. Biophys. Res. Commun.*, 137 (1986) 766-774.
1991 Hamm, H.E. and Bownds, M.D.: Protein complement of rod outer segments of frog retina. *Biochemistry*, 25 (1986) 4512-4523.
1992 Hercz, A.: Differences between the binding of trypsin and chymotrypsin by α_1-proteinase inhibitor. *Biochem. Biophys. Res. Commun.*, 138 (1986) 925-930.
1993 Inomata, M., Imahori, K. and Kawashima, S.: Autolytic activation of calcium-activated neutral protease. *Biochem. Biophys. Res. Commun.*, 138 (1986) 638-643.
1994 Jackson, R.J.: The heat-shock response in *Drosophila* KC 161 cells. mRNA competition is the main explanation for reduction of normal protein synthesis. *Eur. J. Biochem.*, 158 (1986) 623-634.
1995 Nukina, N. and Ihara, Y.: One of the antigenic determinants of paired helical filaments is related to tau protein. *J. Biochem. (Tokyo)*, 99 (1986) 1541-1544.
1996 Plan, E., Seneterre, J.-B., Caudie, C. and Quincy, C.: Comparison between agarose gel electrophoresis (Panagel) of cerebrospinal fluid with silver staining, and polyacrylamide disc gel electrophoresis for demonstration of the oligoclonal pattern in neurological disorders. *Electrophoresis (Weinheim)*, 7 (1986) 376-378.

1997 Sackett, D.L. and Wolff, J.: Proteolysis of tubulin and the substructure of the tubulin dimer. *J. Biol. Chem.*, 261 (1986) 9070-9076.
1998 Thymann, M.: Distribution of α-1-antitrypsin (Pi) phenotypes in Denmark determined by separator isoelectric focusing in agarose gel. *Hum. Hered.*, 36 (1986) 19-23; *C.A.*, 105 (1986) 4161n.

See also 1886, 1961.

20. ENZYMES

20a. Oxidoreductases

1999 Busquets, M. and Franco, R.: A laboratory experiemnt on the purification of catalase. *Biochem. Educ.*, 14 (1986) 84-86; *C.A.*, 105 (1986) 23647s.
2000 Craske, A. and Ferguson, S.J.: The respiratory nitrate reductase from *Paracoccus denitrificans*. Molecular characterisation and kinetic properties. *Eur. J. Biochem.*, 158 (1986) 429-436.
2001 Edwards, P.A., Lan, S.F. and Fogelman, A.M.: The effect of glucagon on the synthesis and degradation of 3-hydroxy-3-methylglutaryl coenzyme A reductase. *J. Lipid Res.*, 27 (1986) 398-403.
2002 Grossebüter, W., Hartl, T., Görisch, H. and Stepowski, J.J.: Purification and properties of malate dehydrogenase from the thermoacidophilic archaebacterium *Thermoplasma acidophilum*. *Biol. Chem. Hoppe-Seyler*, 367 (1986) 457-463.
2003 Krüger, S. and Schlegel, W.: Prostaglandin-E_2 9-ketoreductase from human uterine decidua vera. *Eur. J. Biochem.*, 157 (1986) 481-485.
2004 Maekawa, M., Sudo, K., Iwahara, K. and Kanno, T.: Lactate dehydrogenase inhibition by immunoglobulin G in human serum. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1347-1349.
2005 Olsen, R.L., Steigen, T.K., Holm, T. and Little, C.: Molecular forms of myeloperoxidase in human plasma. *Biochem. J.*, 237 (1986) 559-565.
2006 Rendon, J.L., Calcagno, M., Mendoza-Hernandez, G. and Ondarza, R.N.: Purification, properties, and oligomeric structure of glutathione reductase from the cyanobacterium *Spirulina maxima*. *Arch. Biochem. Biophys.*, 248 (1986) 215-223.
2007 Schmidt, M.L. and Trojanowski, J.Q.: Enzymatic detection of native and derivatized horseradish peroxidase in sodium dodecyl sulfate polyacrylamide gels. *Anal. Biochem.*, 155 (1986) 371-375.
2008 Tanaka, R.D., Li, A.C., Fogelman, A.M. and Edwards, P.A.: Inhibition of lysosomal protein degradation inhibits the basal degradation of 3-hydroxy-3-methylglutaryl coenzyme A reductase. *J. Lipid Res.*, 27 (1986) 261-273.
2009 Vioque, B., Lopez, A., Castellano, J.M., Albi, M.A. and Vioque, A.: Detection of soluble peroxidases by direct plant tissue isoelectric focusing. *Electrophoresis (Weinheim)*, 7 (1986) 392-393.
2010 Wall, L. and Meighen, E.A.: Subunit structure of the fatty acid reductase complex from *Photobacterium phosphoreum*. *Biochemistry*, 25 (1986) 4315-4321.
2011 Webber, S., Hural, J.A. and Whiteley, J.M.: Multiple forms of rat-liver dihydropteridine reductase identified by their differing isoelectric points. *Arch. Biochem. Biophys.*, 248 (1986) 358-367.

See also 1866, 2123.

20b. Transferases (excluding E.C. 2.7.-.-)

2012 Appert, H.E., Rutherford, T.J., Tarr, G.E., Thomford, N.R. and McCorquodale, D.J.: Isolation of galactosyltransferase from human milk and the determnation of its *N*-terminal amino acid sequence. *Biochem. Biophys. Res. Commun.*, 138 (1986) 224-229.
2013 Falany, C.N., Green, M.D., Swain, E. and Tephly, T.R.: Substrate specificity and characterization of rat liver *p*-nitrophenol, 3α-hydroxysteroid and 17β-hydroxysteroid UDP-glucuronosyltransferases. *Biochem. J.*, 238 (1986) 65-73.
2014 Hayes, J.D. and Mantle, T.J.: Anomalous electrophoretic behaviour of the glutathione S-transferase Ya and Yk subunits isolated from man and rodents. *Biochem. J.*, 237 (1986) 731-740.

2015 Li, N., Reddanna, P., Thyagaraju, K., Reddy, C.C. and Tu, C.D.: Expression of glutathione S-transferases in rat brains. *J. Biol. Chem.*, 261 (1986) 7596-7599.
2016 Sinha, P., Köttgen, E. and Righetti, P.G.: Electrophoretic patterns of γ-glutamyl transferase after conventional isoelectric focusing and on immobilized pH gradients. *Fresenius' Z. Anal. Chem.*, 324 (1986) 262-263.

See also 1980, 2096.

20c. Transferases transferring phosphorus containing groups (E.C. 2.7.-.-)

2017 Cobb, M.H., Burr, J.G., Linder, M.E., Gray, T.B. and Gregory, J.S.: A similar ribosomal protein S6 kinase activity is found in insulin-trated 3T3-L1 cells and chick embryo fibroblasts transformed by Rous sarcoma virus. *Biochem. Biophys. Res. Commun.*, 137 (1986) 702-708.
2018 Dang, J., Sun, Z. and Jian, G.: [Isoelectric focusing studies of the polymorphism of the red cell phosphoglucomutase (PGM locus 1) in Chinese]. *Shengwu Huaxue Zazhi*, 1 (1985) 111-115; *C.A.*, 105 (1986) 22233s.
2019 Di Renzo, M.F., Ferracini, R., Naldini, L., Giordano, S. and Comoglio, P.M.: Immunological detection of proteins phosphorylated at tyrosine in cells stimulated by growth factors or transformed by retroviral-oncogene-coded tyrosine kinases. *Eur. J. Biochem.*, 158 (1986) 383-391.
2020 Heumann, H., Metzger, W. and Niehörster, M.: Visualization of intermediary transcription states in the complex between *Escherichia coli* DNA-dependent RNA polymerases and a promoter-carrying DNA fragment using the gel retardation method. *Eur. J. Biochem.*, 158 (1986) 575-579.
2021 Jahnsen, T., Hedin, L., Lohmann, S.M., Walter, U. and Richards, J.S.: The neural type II regulatory subunit of cAMP-dependent protein kinase is present and regulated by hormones in the rat ovary. *J. Biol. Chem.*, 261 (1986) 6637-6639.
2022 Kamel, C., Veno, P.A. and Kinsey, W.H.: Quantitation of a src-like tyrosine protein kinase during fertilization of the sea urchin egg. *Biochem. Biophys. Res. Commun.*, 138 (1986) 349-355.
2023 Liao, Y.-D., Tu, J., Feng, T.-Y. and Kuo, T.-T.: Characterization of phage-*Xp10-coded* RNA polymerase. *Eur. J. Biochem.*, 157 (1986) 571-577.
2024 Ludvigsen, C.W., Muus, C., Meyer, I. and Haven, M.: Creatine kinase variant type I in children with anoxic insult. *Clin. Chem. (Winston-Salem)*, 32 (1986) 689-691.
2025 Marie, J., Simon, M.-P., Lone, Y.-C., Cognet, M. and Kahn, A.: Tissue-specific heterogeneity of the 3'-untranslated region of L-type pyruvate kinase mRNAs. *Eur. J. Biochem.*, 158 (1986) 33-41.
2026 Meng, Z.: [Agarose electrophoresis of creatine kinase isoenzymes and its clinical applications]. *Zhonghua Yixue Jianyan Zazhi*, 8 (1985) 193-198; *C.A.*, 105 (1986) 20763r.
2027 Nakamura, S. and Nonomura, Y.: Ca^{2+}-Independent gizzard myosin light chain kinase produced by cross-linking of the enzyme with calmodulin using glutaraldehyde. *J. Biochem. (Tokyo)*, 99 (1986) 1359-1369.
2028 Rahmatullah, M., Jilka, J.M., Radke, G.A. and Roche, T.E.: Properties of the pyruvate dehydrogenase kinase bound to and separated from the dihydrolipoyl transacetylase-protein X subcomplex and evidence for binding of the kinase to protein X. *J. Biol. Chem.*, 261 (1986) 6515-6523.
2029 Stambolian, D.: Galactokinase: Technique for polyacrylamide gel isoelectric focusing. *Electrophoresis (Weinheim)*, 7 (1986) 390-391.
2030 Thomm, M., Madon, J. and Stetter, K.O.: DNA-Dependent RNA polymerases of the three orders of methanogens. *Biol. Chem. Hoppe-Seyler*, 367 (1986) 473-481.
2031 Ukuka, T., Nishina, H., Ikeda, T. and Ishino, K.: Separation and characterization of ribonuclease A-glutathione mixed disulphide using chromatofocusing and isoelectric focusing. *J. Chromatogr.*, 363 (1986) 431-437.
2032 Vaidya, H.C., Maynard, Y., Dietzler, D.N. and Ladenson, J.H.: Direct measurement of creatine kinase-MB activity in serum after extraction with a monoclonal antibody specific to the MB isoenzyme. *Clin. Chem. (Winston-Salem)*, 32 (1986) 657-663.

See also 2073.

20d. Hydrolases, acting on ester bonds (E.C. 3.1.-.-)

2033 Bennett, V.D. and Dimond, R.L.: Biosynthesis of two developmentally distinct acid phosphatase isozymes in *Dictyostelium discoideum*. *J. Biol. Chem.*, 261 (1986) 5355-5362.

2034 Chen, S., Yue, M., Wang, P., Mao, J. and Huang, X.: (An improved method for DNase zymogram on DNA-polyacrylamide gel electrophoresis). *Shengwu Huaxue Yu Shengwu Wuli Jinzhan*, 65 (1985) 51-54; *C.A.*, 104 (1986) 125456a.

2035 Conary, J., Nauerth, A., Burns, G., Hasilik, A. and von Figura, K.: Steroid sulfatase. Biosynthesis and processing in normal and mutant fibroblasts. *Eur. J. Biochem.*, 158 (1986) 71-76.

2036 Fougier, S., Nemoz, G., Prigent, A.F., Marivet, M., Bourguignon, J.J., Wermuth, C. and Pacheco, H.: Purification of cAMP-specific phosphodiesterase from rat heart by affinity chromatography on immobilized Rolipram. *Biochem. Biophys. Res. Commun.*, 138 (1986) 205-214.

2037 Khatra, B.S.: Subunit structure and properties of the glycogen-bound phosphoprotein phosphatase from skeletal muscle. *J. Biol. Chem.*, 261 (1986) 8944-8952.

2038 Korichneva, I.L., Sanfirova, V.M., Menshikov, V.V. and Titov, V.N.: (Electrophoretic separation of alkaline phosphatase isoenzymes on cellulose acetate membranes). *Lab. Delo*, (1986) 233-235; *C.A.*, 105 (1986) 20769x.

2039 Mizunuma, H. and Tashima, Y.: Characterization of rat muscle fructose 1,6-bisphosphatase. *J. Biochem. (Tokyo)*, 99 (1986) 1781-1788.

2040 Moss, D.W., Parmar, C.R. and Whitaker, K.B.: Comparison of a tumour-derived form of intestinal alkaline phosphatase with foetal and adult intestinal alkaline phosphatases. *Clin. Chim. Acta*, 158 (1986) 165-172.

2041 Onica, D., Sundblad, L. and Waldenlind, L.: Affinity electrophoresis of human serum alkaline phosphatase isoenzymes in agarose gel containing lectin. *Clin. Chim. Acta*, 155 (1986) 285-294.

2042 Robbi, M. and Beaufay, H.: Biosynthesis of rat-liver pI-5.0 esterases in cell-free systems and in cultured hepatocytes. *Eur. J. Biochem.*, 158 (1986) 187-194.

2043 Schweingruber, A.-M., Schoenholzer, F., Keller, L., Schwaninger, R., Trachsel, H. and Schweingruber, M.E.: Glycosylation and secretion of acid phosphatase in *Schizosaccharomyces pombe*. *Eur. J. Biochem.*, 158 (1986) 133-140.

2044 Shirasuna, K., Morioka, S., Watatani, K. and Sugiyama, M.: Different expression of alkaline phosphatase in subclones of human neoplastic salivary duct cell line. *Biochem. Biophys. Res. Commun.*, 138 (1986) 625-630.

2045 Sinha, P.K., Bianchi-Bosisio, A., Meyer-Sabellek, W. and Righetti, P.G.: Resolution of alkaline phosphatase isoenzymes in serum by isoelectric focusing in immobilized pH gradients. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1264-1268.

2046 Steinmüller, K., Batschauer, A. and Apel, K.: Tissue-specific and light-dependent charges of chromatin organization in barley *(Hordeum vulgare)*. *Eur. J. Biochem.*, 158 (1986) 519-525.

See also 2123.

20e. Hydrolases, acting on glycosyl compounds (E.C. 3.2.-.-)

2047 Brouwer, J.: On the stability of urinary lysozyme. *Clin. Chem. (Winston-Salem)*, 32 (1986) 1431-1432.

2048 Modena, D., Vanoni, M., Englard, S. and Marmur, J.: Biochemical and immunological characterization of the STA2-encoded extracellular glucoamylase from *Saccharomyces diastatiens*. *Arch. Biochem. Biophys.*, 248 (1986) 138-150.

See also 1899, 2043, 2123.

20f. Other hydrolases

2049 Barth, F., Gruetter, M.G., Kessler, R. and Manz, H.-J.: The use of free flow electrophoresis in the purification of recombinant human tissue plasminogen activator expressed in yeast. *Electrophoresis (Weinheim)*, 7 (1986) 372-375.

2050 Berruti, G., Merigioli, G. and Martegani, E.: Biochemical studies on pro-acrosin and acrosin from epididymal boar spermatozoa: *in vitro* translation of boar testicular proacrosin mRNA. *Biochem. Biophys. Res. Commun.*, 138 (1986) 139-145.

2051 Grasso, M., Morelli, A. and DeFlora, A.: Calcium-induced alterations in the levels and subcellular distribution of proteolytic enzymes in human red blood cells. *Biochem. Biophys. Res. Commun.*, 138 (1986) 87-94.
2052 Hubert, J.J., Schenk, D.B., Skelly, H. and Leffert, H.L.: Rat hepatic (Na^+,K^+)-ATPase: α-subunit isolation by immunoaffinity chromatography and structural analysis by peptide mapping. *Biochemistry*, 25 (1986) 4156-4163.
2053 Lane, L.K., Kirley, T.L. and Ball, W.J., Jr.: Structural studies on H^+,K^+-ATPase: Determination of the NH_2-terminal amino acid sequence and immunological cross-reactivity with Na^+,K^+-ATPase. *Biochem. Biophys. Res. Commun.*, 138 (1986) 185-192.
2054 McCarty, D.R. and Selman, B.R.: Partial purification of a nucleoside triphosphatase from the inner membrane of the chloroplast envelope of pea. *Arch. Biochem. Biophys.*, 248 (1986) 523-531.
2055 Morisset, M., Capony, F. and Rochefort, H.: The 52-kDa estrogen-induced protein secreted by MCF_7 cells is a lysosomal acidic protease. *Biochem. Biophys. Res. Commun.*, 138 (1986) 102-109.
2056 Muir, A., Offord, R.E. and Dabies, J.G.: The identification of a major product of the degradation of insulin by "insulin proteinase" (E.C. 3.4.22.11). *Biochem. J.*, 237 (1986) 631-637.
2057 Nojima, M., Ishura, S., Yamamoto, T., Okuyama, T., Furuya, H. and Sugita, H.: Purification and characterization of a high-molecular weight protease, ingensin, from human placenta. *J. Biochem. (Tokyo)*, 99 (1986) 1605-1611.
2058 Ohta, S. and Kagawa, Y.: Human F_1-ATPase: molecular cloning of cDNA for the beta subunit. *J. Biochem. (Tokyo)*, 99 (1986) 135-141.
2059 Okada, Y., Hashimoto, T., Yoshida, Y. and Tagawa, K.: Existence of stoichiometric amounts of an intrinsic ATPase inhibitor and two stabilizing factors with mitochondrial ATP synthase in yeast. *J. Biochem. (Tokyo)*, 99 (1986) 251-256.
2060 Stan-Lotter, H. and Bragg, P.D.: N,N'-Dicyclohexylcarbodiimide and 4-chloro-7-nitrobenzofurazan bind to different β-subunits of the F_1 ATPase of *Escherichia coli*. *Arch. Biochem. Biophys.*, 248 (1986) 116-120.

See also 1993.

20g. Lyases

2061 Toguri, T., Muto, S. and Miyachi, S.: Biosynthesis and intracellular processing of carbonic anhydrase in *Chlamydomonas reinhardtii*. *Eur. J. Biochem.*, 158 (1986) 443-450.
2062 Viallard, J.-L., Ven Murthy, M.R. and Dastugue, B.: Rapid electrophoretic determination of neuron-specific enolase isoenzymes in serum. *Clin. Chem. (Winston-Salem)*, 32 (1986) 593-596.
2063 Walker, J.L. and Oliver, D.J.: Light-induced increases in the glycine decarboxylase multienzyme complex from pea leaf mitochondria. *Arch. Biochem. Biophys.*, 248 (1986) 626-638.

20h. Isomerases

2064 Bruenger, E., Chayet, L. and Rilling, H.C.: Isopentenyl pyrophosphate isomerase: dimethylallyl pyrophosphate isomerase: isolation from *Clariceps sp.* SD 58 and comparison to the mammalian enzyme. *Arch. Biochem. Biophys.*, 248 (1986) 620-625.
2065 Hamelin, C., Yelle, J. and Dion, M.: Fast electrophoresis in superposed agarose minigels for DNA topoisomerase assays. *Electrophoresis (Weinheim)*, 7 (1986) 323-326.
2066 Heller, R.A., Shelton, E.R., Dietrich, V., Elgin, S.C.R. and Brutlag, D.L.: Multiple forms and cellular localization of *Drosophila* DNA topoisomerase II. *J. Biol. Chem.*, 261 (1986) 8063-8069.
2067 Hyder, S.M., Baldi, A., Crespi, M. and Wittliff, J.L.: Rapid purification of topoisomerase I from breast cancer cells by high-performance liquid chromatography. *J. Chromatogr.*, 359 (1986) 433-447.

20i. Ligases

2068 Sallagranque, M.-L., Garret, M., Benedetto, J.-P., Fournier, M., Labouesse, B. and Bonnet, J.: Tryptophanyl-tRNA synthetase is a major soluble protein species in bovine pancreas. *Biochim. Biophys. Acta*, 882 (1986) 192-199.

20j. Complex mixtures and incompletely identified enzymes

2069 Selander, R.K., Caugant, D.A., Ochman, H., Musser, J.M., Gilmour, M.N. and Whittam, T.S.: Method of multilocus enzyme electrophoresis for bacterial population genetics and systematics. *Appl. Environ. Microbiol.*, 51 (1986) 873-884; *C.A.*, 105 (1986) 2497c.

2070 Wong, S.W., Paborsky, L.R., Fisher, P.A., Wang, T.S. and Korn, D.: Structural and enzymological characterization of immunoaffinity-purified DNA polymerase α. DNA Primase complex from KB cells. *J. Biol. Chem.*, 261 (1986) 7958-7968.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

2071 Budowsky, E.I., Axentyeva, M.S., Abdurashidova, G.G., Simukova, N.A. and Rubin, L.B.: Induction of polynucleotide-protein cross-linkages by ultraviolet irradiation. Peculiarities of the high-intensity laser pulse irradiation. *Eur. J. Biochem.*, 159 (1986) 95-101.

2072 Furth, J.J. and Su, C.-Y.: Transcription of genomic bovine and *Xenopus laevis* DNA species by RNA polymerase III in HeLa-cell cytosol extracts. *Biochem. J.*, 237 (1986) 827-835.

2073 Waldmann, R., Bauer, S., Göbel, C., Hofmann, F., Jakobs, K.H. and Walter, U.: Demonstration of cGMP-dependent protein kinase and cGMP-dependent phosphorylation in cell-free extracts of platelets. *Eur. J. Biochem.*, 158 (1986) 203-210.

21b. Nucleic acids, RNA

2074 Berger, F.G. and Porter, C.W.: Putrescine does not mediate the androgen-response in mouse kidney. *Biochem. Biophys. Res. Commun.*, 138 (1986) 771-777.

2075 Bukrinskaya, A.G., Gracheva, N.M., Starov, A.I., Moisiadi, S.A., Blokhina, T.A. and Avakov, A.A.: (Rapid diagnosis of rotavirus infections by RNA polyacrylamide gel electrophoresis). *Vopr. Virusol.*, 31 (1986) 197-200; *C.A.*, 105 (1986) 21234f.

2076 Cooke, R. and Penon, P.: Detection of a potential transcription control sequence on the cauliflower mosaic virus genome by dinucleotide-primed "*in vitro*" transcription. *Biochem. Biophys. Res. Commun.*, 138 (1986) 17-23.

2077 Hirama, M., Takeda, A. and McKune, K.J.: Direct purification of polyadenylated RNAs from isolated polysome fractions. *Anal. Biochem.*, 155 (1986) 385-390.

2078 King, M.W. and Norman, A.W.: Analysis of the mRNA coding for the chick vitamin D-induced calbindin and its regulation by 1,25-dihydroxyvitamin D_3. *Arch. Biochem. Biophys.*, 248 (1986) 612-619.

2079 Macdonell, M.T., Morris, S.C., Ortiz-Conde, B.A., Pillidge, C.J. and Colwell, R.R.: Application of ion-exchange high-performance liquid chromatography in the purification of 5S rRNAs suitable for sequence analysis. *J. Chromatogr.*, 363 (1986) 438-443.

2080 Marguet, D. and Lauquin, J.-M.: The yeast SRP gene: positive modulation by glucose of its transcriptional expression. *Biochem. Biophys. Rec. Commun.*, 138 (1986) 297-303.

2081 Nicole, L.M., Valet, J.P., Laberge, C. and Tanguay, R.M.: Purification of mRNA coding for the enzyme deficient in hereditary tyrosinemia, fumarylacetoacetate hydrolase. *Biochem. Cell Biol.*, 64 (1986) 489-493.

2082 Satow, H., Sakai, S. and Obinata, M.: Post-transcriptional control of 26k casein genes during lactogenesis in mouse mammary glands. *J. Biochem. (Tokyo)*, 99 (1986) 1639-1643.

2083 Suzuki, R., Masaki, S., Koiwai, O. and Yoshida, S.: Characterization of DNA primase separated from DNA polymerase α-DNA primase complex of calf thymus. *J. Biochem. (Tokyo)*, 99 (1986) 1673-1679.

2084 Tinker, D., Geller, J., Romero, N., Cross, C.E. and Rucker, R.B.: Tropoelastin production and tropoelastin messenger RNA activity. Relationship to copper and elastin cross-linking in chick aorta. *Biochem. J.*, 237 (1986) 17-23.

See also 1959, 1994.

V1a. Nucleic acids, DNA

2085 Birch, H.E. and Schreiber, G.: The association of acute phase protein genes with the nuclear matrix of rat liver during experimental inflammation. *Biochem. Biophys. Res. Commun.*, 137 (1986) 633-639.

2086 Butler, A.P.: Supercoil-dependent recognition of specific DNA sites by chromosomal protein HMG 2. *Biochem. Biophys. Res. Commun.*, 138 (1986) 910-916.

2087 Cairns, S.S. and Bogenhagen, D.F.: Mapping of the displacement loop within the nucleotide sequence of *Xenopus laevis* mitochondrial DNA. *J. Biol. Chem.*, 261 (1986) 8481-8487.

2088 Carroll, S.L., Bergsma, D.J. and Schwartz, R.J.: Structure and complete nucleotide sequence of the chicken α-smooth muscle messenger RNAs. *J. Biol. Chem.*, 261 (1986) 8965-8976.

2089 Cha, T. and Alberts, B.M.: Studies of the DNA helicase-RNA primase unit from bacteriophage T4. A trinucleotide sequence on the DNA template starts RNA primer synthesis. *J. Biol. Chem.*, 261 (1986) 7001-7010.

2090 Dion, M., Vodjdani, G. and Doly, J.: Sequence and expression of a novel murine interferon alpha gene - homology with enhancer elements in the regulatory region of the gene. *Biochem. Biophys. Res. Commun.*, 138 (1986) 826-834.

2091 Dubeau, L., Chandler, L.A., Gralow, J.R., Nichols, P.W. and Jones, P.A.: Southern blot analysis of DNA extracted from formalin-fixed pathology specimens. *Cancer Res.*, 46 (1986) 2964-2969.

2092 Kaneko, S., Oshima, T., Kodama, K., Aoyama, S., Yoshikawa, H., Unoura, M., Fukuoka, K., Matsushita, F., Morimoto, H., Kobayashi, K., Hattori, N. and Murakami, S.: Stable integration of woodchuck hepatitis virus DNA in transplanted tumors and established tissue culture cells derived from a woodchuck primary hepatocellular carcinoma. *Cancer Res.*, 46 (1986) 3608-3613.

2093 McNamara, P.T., Winicov, I. and Harrington, R.E.: Preferential nucleosome placement on pBR 322 restriction fragments. *Biochem. Biophys. Res. Commun.*, 138 (1986) 110-117.

2094 Mergia, A., Eddy, R., Abraham, J.A., Fiddes, J.C. and Shows, T.B.: The genes for basic and acidic fibroblast growth factors are on different human chromosomes. *Biochem. Biophys. Res. Commun.*, 138 (1986) 644-651.

2095 Mita, S., Maeda, S. and Shimada, K.: Characterization of human genomic DNA sequences homologous to the interleukin 2 cDNA. *Biochem. Biophys. Res. Commun.*, 138 (1986) 966-973.

2096 Murata, M.: (Focusing electrophoresis apparatus for determination of nucleic acids and other substances). *Jpn. Kokai Tokkyo Koho Pat.* JP 60,192,248 (85,192,248) (Cl.G01N27/26), 30 Sep. 1985, Appl. 84/47,722, 13 Mar. 1984, 3 pp.; *C.A.*, 105 (1986) 3060s.

2097 Oh, Y.K., Farei, L.R., Taylor, D.P., Widger, J. and Nisbet, L.J.: A cryptic plasmid from *Nocardia orientalis* NRRL 2452, a vancomycin producer. *J. Antibiot.*, 39 (1986) 694-698.

2098 Recinos, III., A. and Lloyd, R.S.: Efficient screening of recombinant DNA junctions afforded by probing with synthetic "bridge" oligonucleotides. *Biochem. Biophys. Res. Commun.*, 138 (1986) 945-952.

2099 Simmen, F.A., Mandel, M. and Humphreys, T.: Length and sequence polymorphisms in the ribosomal gene spacer of the Hawaiian sea urchin, *T. gratilla*. *Biochem. Biophys. Res. Commun.*, 137 (1986) 834-840.

2100 Srivenugopal, K.S. and Morris, D.R.: Modulation of the relaxing activity of *Escherichia coli* topoisomerase I by single-stranded DNA binding proteins. *Biochem. Biophys. Res. Commun.*, 137 (1986) 795-800.

2101 Su, T.-S., Lin, L-H., Chou, C.-K., Chang, C., Ting, L.-P., Hu, C.-p. and Han, S.-H.: Hepatitis B virus transcripts in a human hepatoma cell line, Hep3B. *Biochem. Biophys. Res. Commun.*, 138 (1986) 131-138.

2102 Tajbakhsh, S., Dove, M.J., Lee, P.E. and Seligy, V.L.: DNA components of *Tipula* iridenscent virus. *Biochem. Cell Biol.*, 64 (1986) 495-503.

2103 Tashiro, F., Morimura, S., Hayashi, K., Makono, R., Kawamura, H., Horikoshi, N., Nemoto, K., Ohtsubo, K., Sugimura, T. and Ueno, Y.: *Expression of the c-Ha-ras and c-myc genes in aflatoxin B_1-induced hepatocellular carcinomas. Biochem. Biophys. Res. Commun.*, 138 (1986) 858-864.

2104 Zhang, Y.Z., Zylstra, G.J., Olsen, R.H. and Reddy, C.A.: Identification of cDNA clones for ligninase from *Phanerochaete chrysosporium* using synthetic oligonucleotide probes. *Biochem. Biophys. Res. Commun.*, 137 (1986) 649-656.

21d. Nucleoproteins

See 2093.

21f. Structural studies of nucleic acids

2105 Garcia, J.L., Sanchez-Puelles, J.M., Garcia, P., Lopez, R., Ronda, C. and Garcia, E.: Molecular characterization of an autolysin-defective mutant of *Streptococcus pneumoniae*. *Biochem. Biophys. Res. Commun.*, 137 (1986) 614-619.

2106 Hayano, T., Sogawa, K., Ichihara, Y., Fujii-Kuriyama, Y. and Takahashi, K.: Close linkage of human chromosomal pepsinogen A genes. *Biochem. Biophys. Res. Commun.*, 138 (1986) 289-296.

2107 Kanbara, H., Shimada, T., Tokita, J. and Watanabe, K.: (Apparatus for nucleic acid sequence determination). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 47,563 (86 47,563) (C1.G01N33/50), 08 Mar. 1986, Appl. 84/167,811, 13 Aug. 1984, 4 pp.; *C.A.*, 105 (1986) 3066y.

2108 Parvin, J.D., Smith, F.I. and Palese, P.: Rapid RNA sequencing using double-stranded template DNA, SP6 polymerase, and 3'-deoxynucleotide triphosphates. *DNA*, 5 (1986) 167-171; *C.A.*, 105 (1986) 2921m.

2109 Shea, C., Glass, D.J., Parangi, S. and van der Ploeg, L.H.T.: Variant surface glycoprotein gene expression site switches in *Trypanosoma brucei*. *J. Biol. Chem.*, 261 (1986) 6056-6063.

2110 Takahashi, K. and Kaneko, I.: DNA fragments of 300 base pairs released from metaphase chromosomes by digestion with deoxyribonuclease I. *Biochem. Biophys. Res. Commun.*, 138 (1986) 413-418.

2111 Watabe, K., Kanbara, H., Shimada, T., Tokita, J. and Okada, O.: (Apparatus for nucleic acid sequence determination). *Jpn. Kokai Tokkyo Koho Pat.* JP 61 47,564 (86 47,564) (C1.G01N33/50), 08 Mar. 1986, Appl. 84/167,814, 13 Aug. 1984, 6 pp.; *C.A.*, 105 (1986) 3067z.

2112 Yamamoto, Y., Ogawa, T., Shinagawa, H., Nakayama, T., Matsuo, H. and Ogawa, H.: Determination of the initiation sites of transcription and translation of the uvr D gene of *Escherichia coli*. *J. Biochem. (Tokyo)*, 99 (1986) 1579-1590.

24. ORGANIC SULPHUR COMPOUNDS

See 1867.

25. ORGANIC PHOSPHORUS COMPOUNDS

See 1866.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26c. Coordination compounds

2113 Fukushi, K. and Hiiro, K.: Determination of some metal-EDTA complexes by capillary type isotachophoresis. *Anal. Sci.*, 1 (1985) 345-347; *C.A.*, 104 (1986) 141502t.

2114 Singh, S., Gupta, S. and Yadava, K.L.: Electrophoretic method for the study of mixed complexes metal-nitrilotriacetate-isoleucinate systems. *J. Electrochem. Soc. India*, 35 (1986) 1-4; *C.A.*, 105 (1986) 13079u.

28. ANTIBIOTICS

2115 Davidson, D.F. and Fitzpatrick, J.: Rapid column-chromatographic analysis of chloramphenicol in serum. *Clin. Chem. (Winston-Salem)*, 32 (1986) 701-702.

30. SYNTHETIC AND NATURAL DYES

30b. Chloroplast and other natural pigments

2116 Hiraoka, A. and Yoshitama, K.: Isotachophoresis of anthocyanins. *Chem. Pharm. Bull.*, 34 (1986) 2257 2260.
2117 Kubo, K. and Takagi, T.: Marked effect of cations on the separation of spinach thylakoid chlrophyll-proteins on polyacrylamide-gel electrophoresis at 0°C in the presence of alkanolammonium dodecyl sulfates. *J. Biochem. (Tokyo)*, 99 (1986) 1545-1548.

31. PLASTICS AND THEIR INTERMEDIATES

2118 Snyder, R.S., Rhodes, P.H., Miller, T.Y., Micale, F.J., Mann, R.V. and Seaman, G.V.F.: Polystyrene latex separations by continuous flow electrophoresis on the space shuttle. *Separ. Sci.*, 21 (1986) 157-185.
2119 Whitlock, L.R.: Isotachophoresis of synthetic ion-containing polymers. Characterization of the carboxymethyl distribution in carboxymethylcellulose. *J. Chromatogr.*, 363 (1986) 267-276.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. Synthetic drugs

2120 Jannasch, R.: Die Kapillarisotachophorese - eine neue Methode in der Arzneimittelanalytik. 3. Mitt.: Analytische Kapillarisotachophorese zur Bestimmung von Amantadin und Rimantadin. *Pharmazie*, 41 (1986) 478-482.
2121 Jannasch, R.: Die Kapillarisotachophorese - eine neue Methode in der Arzneimittelanalytik. 4. Mitt.: Analytische Kapillarisotachophorese von Obidoxim und Pyridin-4-aldoxim. *Pharmazie*, 41 (1986) 511-512.

32b. Pharmacokinetics studies

See 1833.

32f. Clinico-chemical applications and profiling body fluids

2122 Inman, R.D., Hamilton, N.C., Redecha, P.B. and Hochhauser, D.M.: Electrophoretic transfer blotting analysis of immune complexes in rheumatoid arthritis. *Clin. Exp. Immunol.*, 63 (1986) 32-40; *C.A.*, 105 (1986) 4701p.
2123 Maekawa, M., Sudo, K. and Kanno, T.: A case of rheumatoid arthritis with various enzyme-immunoglobulin complexes. *Clin. Chim. Acta*, 157 (1986) 45-54.
2124 Tienhaara, A., Irjala, K., Rajamaki, A. and Pulkki, K.: Four monoclonal immunoglobulins in a patient with chronic lymphocytic leukemia. *Clin. Chem. (Winston-Salem)*, 32 (1986) 703-705.

See also 1842, 1848, 1855, 1911, 1914, 1916, 1950, 1986, 1996, 2004, 2005, 2040, 2041, 2045, 2125.

33. INORGANIC COMPOUNDS

33a. Cations

2125 Maier, E.A., Dietemann-Molard, A., Rastegar, F., Heimburger, R., Ruch, C., Maier, A., Roegel, E. and Leroy, J.F.: Simultaneous determination of trace elements in lavage fluids from human bronchial alveoli by energy-dispersive X-ray fluorescence. 2. Determination of abnormal lavage contents and verification of the results. *Clin. Chem. (Winston-Salem)*, 32 (1986) 664-668.

2126 Shishan, Z., Yune, Z. and Wagner, H.: Continuous free focusing electrophoresis of metal ions in stepwise pH gradient system. *Microchem. J.*, 33 (1986) 216-222; *C.A.*, 105 (1986) 34683b.

2127 Singh, S., Gupta, S. and Yadava, K.L.: Electrophoretic determination of stability constants of some mixed complexes of thorium(IV), chromium(III) and aluminium(III). *J. Electrochem. Soc. India*, 35 (1986) 55-56; *C.A.*, 105 (1986) 13080n.

2128 Valaskova, I., Majer, J. and Van, Q.T.: (Electrophoretic separation of inorganic ions using N-(methylphosphonic)iminodiacetic acid). *Czech. Pat.* CS 223,658 (Cl.B01D57/02), 15 Mar. 1986, Appl. 80/3,072, 04 May 1980; 4 pp.; *C.A.*, 105 (1986) 34820u.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

2129 Filthuth, H.: Direct quantitative measurement of radiochromatograms and electropherograms with position sensitive wire chambres. In: Muccino, R.R. (Editor), *Synth. Appl. Isot. Labeled Compd. Proc. Int. Symp., 2nd 1985*, Elsevier, Amsterdam, 1986, pp. 465-472; *C.A.*, 104 (1986) 232363q - a review with 12 refs.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35d. Various technical products

2130 Chernoberezhskii, Yu.M., Klochkova, O.V., Kuchuk, V.I. and Golikova, E.V.: The electrophoretic behavior of the aqueous dispersion of natural diamond in aluminium chloride solutions. *Kolloidn. Zh.*, 48 (1986) 593-596; *C.A.*, 105 (1986) 30683d.

36. CELLS AND CELLULAR PARTICLES

2131 Bauer, J. and Hannig, K.: Human antibody-secreting cells enriched by free flow electrophoresis. *Electrophoresis (Weinheim)*, 7 (1986) 367-371.

2132 Brethes, D., Dulon, D., Johannin, G., Arrio, B., Gulik-Krzywicki, T. and Chevallier, J.: Study of the electrokinetic properties of reconstituted sarcoplasmic reticulum vesicles. *Arch. Biochem. Biophys.*, 246 (1986) 355-365.

2133 Stoicheva, N. and Dimitrov, D.S.: Frequency effects in protoplast dielectrophoresis. *Electrophoresis (Weinheim)*, 7 (1986) 339-341.

See also 1823.

BIBLIOGRAPHY SECTION

SUPPLEMENT TO THE
JOURNAL OF CHROMATOGRAPHY

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INDEXES

INTRODUCTION

As in previous years we present here the Subject Index and the Index of Types of Compounds Chromatographed. Because the methodological part differs substantially in individual techniques, we have retained the subdivision system, using the following abbreviations: C = Liquid column chromatography, E = Electrophoresis, G = Gas chromatography, P = Planar chromatography. In the Index of Types of Compounds Chromatographed all types of methods are indicated in the individual entries by appropriate abbreviations. In entries that are heavily populated by chromatographic papers we made a further subdivision into Techniques and Applications. Reviews are clearly indicated. In the Subject Index materials and procedures in common use are not quoted as special entries.

Prague (Czechoslovakia) Z. DEYL, V. SCHWARZ and K. MACEK
Brno (Czechoslovakia) J. JANÁK

Subject Index

Please note that this Index refers to the entry numbers in the Bibliography section (vol. 372). Individual parts of the Bibliography section (Liquid column chromatography, Gas chromatography, Planar chromatography and Electrophoresis) are numbered separately

Liquid Column Chromatography

Gas Chromatography

Planar Chromatography

Electrophoresis

Index of Types of Compounds Chromatographed

This Index follows generally identical rules as those published in previous years, i.e. references of general interest and techniques are within a given entry listed first, followed by applications and finally by papers limited to a certain area of applications only. This, however, is applicable only to highly populated entries, where subdivision appeared necessary. As in the past years (see J. Chromatogr. Vol. 335) the individual parts of the Bibliography section, i.e. Liquid column chromatography (C), Gas chromatography (G), Planar chromatography (P) and Electrophoresis (E) were numbered separately. Therefore the respective shortening should direct the reader to one of the techniques first before looking for a particular number (identical numbers occur under different techniques). Please note that this Index refers to the entry numbers in the Bibliography section vol. 372.

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PUBLICATION SCHEDULE FOR 1986

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INFORMATION FOR AUTHORS

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Optimization of Chromatographic Selectivity

A Guide to Method Development

by **P. Schoenmakers,** *Philips Research Laboratories, Eindhoven, The Netherlands*

(Journal of Chromatography Library, 35)

This is the first detailed description of method development in chromatography – the overall process of which may be summarized as: method selection, phase selection, selectivity optimization, and system optimization. All four aspects receive attention in this book.

Chapter 1 gives a short introduction, describes chromatographic theory and nomenclature, and outlines the method development process. Chapter 2 describes guidelines for method selection, and quantitative concepts for characterizing and classifying chromatographic phases. Selective separation methods, from both gas and liquid chromatography are given in Chapter 3; the main parameters of each method are identified and simple, quantitative relations are sought to describe their effects. Criteria by which to judge the quality of separation are discussed in Chapter 4 with clear recommendations for different situations. The specific problems involved in the optimiz of chromatographic selectivity ar explained in Chapter 5. Optimizat procedures, illustrated by exampl are extensively described and compared on the basis of a numbe criteria. Suggestions are made bot the application of different proced and for further research. The optimization of programmed anal receives special attention in Chapt and the last chapter summarizes t optimization of the chromatograp system, including the optimiza on the efficiency, sensitivity and instrumentation.

Those involved in developing chromatographic methods or wish to improve existing methods will v the detailed, structured way in wh the subject is presented. Because optimization procedures and criter are described as elements of a complete optimization package, the book will help the reader to understand, evaluate and select current a future commercial systems.

Contents: 1. Introduction, 2. Selecti of Methods. 3. Parameters Affectin Selectivity. 4. Optimization Criteria 5. Optimization Procedures. 6. Programmed Analysis. 7. System Optimization. Author Index. Subject Index.

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