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MONTH	J	F	M	A	M	J	J	A	S	O	N	D
Journal of Chromatography	130 131	132/1 132/2 132/3	133/1 133/2	134/1 134/2	135/1 135/2	136/1 136/2 136/3	137/1 137/2	138/1 138/2	139/1 139/2	140/1 140/2 140/3	142 144/1	144/2 144/3
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Chromatographic Reviews				141/1				141/2				141/3

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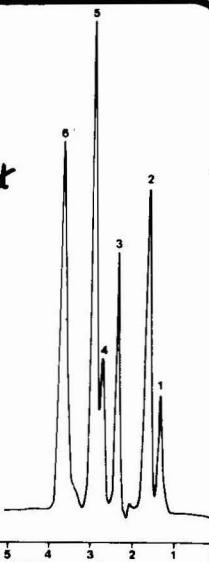
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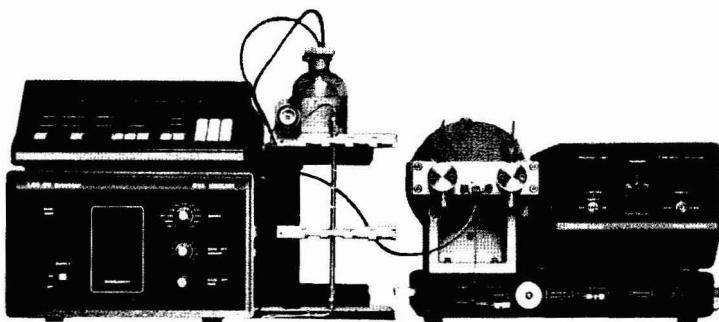
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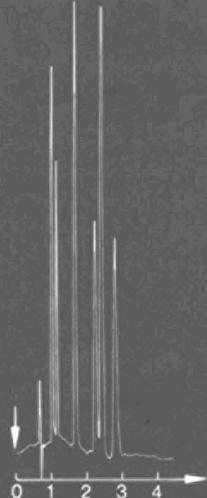
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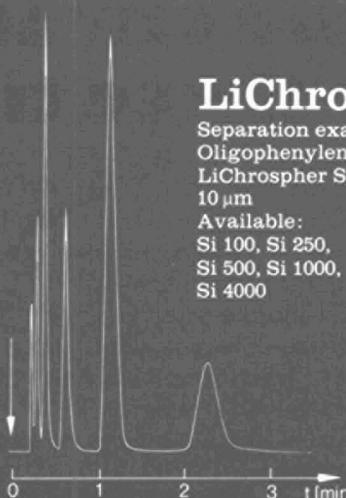
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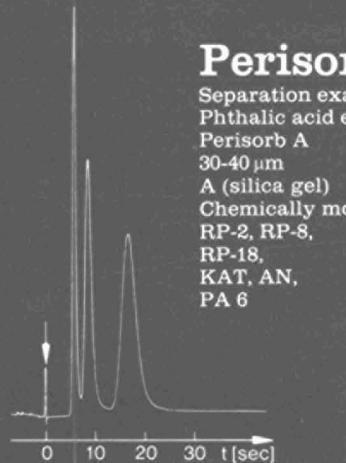
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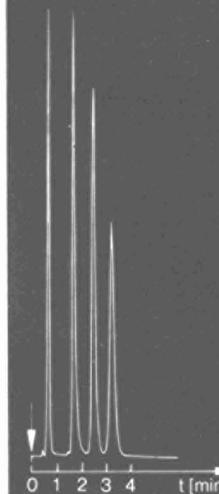
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Bibliography Section

Gas Chromatography

1. REVIEWS AND BOOKS

- 4489 Goryaev, M.I. and Evdakova, N.A.: (*A handbook of gas-liquid chromatography of organic acids*). Nauka, Alma Ata, 1977, 549 pp.
4490 Zlatkis, A. (Editor): *Advances in Chromatography 1976*; Proceedings of the Eleventh International Symposium held in Houston, Texas, November 1-5, 1976. University of Houston, Houston, 1976, XVI + 802 pp.; *J. Chromatogr.*, Vol. 126 (1976), XVIII + 798 pp.

See also 4513, 4616, 4648, 4769.

2. FUNDAMENTALS, THEORY AND GENERAL

2c. Thermodynamics and theoretical relationships

- 4491 Astakhov, V.A., Romankov, P.G. and Lukin, V.D.: (Calculation of equilibrium adsorption in a gas (vapour)-microporous adsorbent system). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 1754-1758.
4492 Fellous, R., Luft, R. and Rabine, J.-P.: Comportement des éthers. VII. Principe de la détermination des constantes d'effet polaire. *J. Chromatogr.*, 133 (1977) 7-13.
4493 Giddings, J.C., Bowman, Jr., L.M. and Myers, M.N.: Exclusion chromatography in dense gases: An approach to viscosity optimization. *Anal. Chem.*, 49 (1977) 243-249.
4494 Jaroniec, M., Leboda, R., Sokolowski, S. and Waksmundzki, A.: Some remarks on application of gas-adsorption chromatography data for investigations of the adsorptive properties of adsorbents. *Separ. Sci.*, 11 (1976) 411-415.
4495 Katsanos, N.A., Karaiskakis, G. and Karabasis, I.Z.: Theory of non-equilibrium stopped-flow gas chromatography. *J. Chromatogr.*, 130 (1977) 3-12.
4496 Shinnar, R. and Weiss, G.H.: A note on the resolution of two gaussian peaks. *Separ. Sci.*, 11 (1976) 377-383.
4497 Suprynowicz, Z., Gawdzik, J. and Jaroniec, M.: Some remarks on the characterization of gas-solid chromatographic systems. *J. Chromatogr.*, 133 (1977) 349-351.
4498 Wong, A.K., McCoy, B.J. and Carbonell, R.G.: Theory of capillary chromatography. Effect of coiling and interphase mass transfer. *J. Chromatogr.*, 129 (1976) 1-18.

See also 4532.

2d. General

- 4499 Belen'kii, B.G. and Vilenchik, L.Z.: (Determination of the number of unresolved components in chromatographic peaks). *Zh. Fiz. Khim.*, 50 (1976) 2932-2933.
4500 Engewald, W. and Wennrich, L.: Molekülstruktur und Retentionsverhalten. VII. Zum Retentionsverhalten höherer Alkylbenzole bei der Gas-Verteilungs-Chromatographie. *Chromatographia*, 9 (1976) 540-547.
4501 Franken, I.J.J.: Comment of real plate bright. *Chromatographia*, 9 (1976) 643.
4502 Haken, J.K., Wainwright, M.S. and Smith, R.J.: A problem of accuracy of mathematical deadtime estimation. *J. Chromatogr.*, 133 (1977) 1-6.

- 4503 Kaiser, R.E.: Letters to the editors. Real plate bright. *Chromatographia*, 9 (1976) 644-646 - answer to a discussion letter.
- 4504 Kalinichev, A.I.: (Method of moments in the theory of non-equilibrium elution dynamics of the sorption of one compound at a non-linear isotherm). *Zh. Fiz. Khim.*, 50 (1976) 1839-1841 - useful in GC too.
- 4505 Kalinichev, A.I.: (Regularities in the broadening of adsorption and desorption fronts of a wide chromatographic peak of a compound at a non-linear adsorption isotherm). *Zh. Fiz. Khim.*, 50 (1976) 3135-3140.
- 4506 Kalinichev, A.I., Goryacheva, N.A., Chmutov, K.V., Pronin, A.Ya. and Zolotarev, P.P.: (Effect of non-linearity of the isotherm on the shape of chromatographic peak). *Zh. Fiz. Khim.*, 50 (1976) 2056-2059.
- 4507 Khobotova, T.P., Yanovskii, S.M. and Zhukhovitskii, A.A.: (Contribution of adsorption to the peak broadening in gas-liquid chromatography). *Zh. Fiz. Khim.*, 50 (1976) 3141-3144.
- 4508 Petitclerc, T. and Guiochon, G.: Determination of the higher moments of a nonsymmetrical chromatographic signal. *J. Chromatogr. Sci.*, 14 (1976) 531-535.
- 4509 Reznikov, S.A. and Sidorov, R.I.: (Molecular theory of Barker's solutions and the calculation of the retention in gas-liquid chromatography). *Zh. Fiz. Khim.*, 50 (1976) 957-959.
- 4510 Rix, H. and Malenge, J.P.: Détection de la présence d'un second corps dans un pic chromatographique. *Chromatographia*, 9 (1976) 554-560.
- 4511 Shatts, V.D., Avots, A.A. and Belikov, V.A.: (Some correlations in gas-liquid chromatography of ketones). *Zh. Fiz. Khim.*, 50 (1976) 1874-1875.
- 4512 Takeda, I. and Mashiko, Y.: (Compilation and retrieval of retention data of capillary gas chromatograph using logarithmic scale and logarithmic chromatogram). *Bunseki Kagaku (Jap. Anal.)*, 26 (1977) 107-111.
- 4513 Vigdergauz, M.S.: (Linear retention index in isothermal gas chromatography. A review). *Zh. Anal. Khim.*, 31 (1976) 2222-2235 - 48 references.

See also 4527, 4535, 4543, 4545, 4555, 4569, 4617.

3. TECHNIQUES I

3a. Detectors

- 4514 Bird, G.M. and Keller, R.A.: Vapor concentration dependence of plasmagrams. *J. Chromatogr. Sci.*, 14 (1976) 574-577.
- 4515 Blum, W. and Richter, W.J.: Parallel flame ionization detection-total ion current recording in capillary gas chromatography-chemical-ionization mass spectrometry. *J. Chromatogr.*, 132 (1977) 249-259.
- 4516 Braun, W.H., Madrid, E.O. and Karbowski, R.J.: Parallel gas chromatography-mass spectrometry and gas proportional counting. *Anal. Chem.*, 48 (1976) 2284-2285.
- 4517 Buser, H.U., Friedrich, K. and Grolimund, K.: A device for rapidly optimizing the flow rates of hydrogen and combustion air used in a flame ionization detector. *Chromatographia*, 9 (1976) 641-642.
- 4518 Driscoll, J.N. and Clarici, J.B.: Ein neuer Photoionisationdetektor für die Gas-Chromatographie. *Chromatographia*, 9 (1976) 567-570.
- 4519 Garwin, E.L. and Roder, A.: Electrolytic conductivity detector for trace analysis of H₂, HD, D₂, and neon in hydrogen and deuterium. *J. Chromatogr. Sci.*, 14 (1976) 541-545.
- 4520 Horning, E.C., Carroll, D.I., Dzidic, I., Haegele, K.D., Lin, S.-N., Oertli, C.U. and Stillwell, R.N.: Development and use of analytical systems based on mass spectrometry. *Clin. Chem.*, 23 (1977) 13-21.
- 4521 Kowalski, J., Scibiorek, M. and Chojnowski, J.: Correlation of the response factors of thermal-conductivity detector with molecular weight for methylsiloxanes. *J. Chromatogr.*, 130 (1977) 351-353.
- 4522 Lasa, J. and Rosiek, J.: (Constant frequency and constant current modes of operation of the pulse supplied electron capture detector). *Chem. Anal. (Warsaw)*, 21 (1976) 201-210.
- 4523 Lubkowitz, J.A., Glajch, J.L., Semonian, B.P. and Rogers, L.B.: Study of the nitrogen response mode of the thermionic rubidium silicate detector. *J. Chromatogr.*, 133 (1977) 37-47.

- 4524 Rosiek, J., Gudowski, W. and Lasa, J.: Analytical parameters of a photoionization detector for gas chromatography. *Chem. Anal. (Warsaw)*, 21 (1976) 1251-1260.
- 4525 Tominaga, T., Makide, Y., Fukumizu, T. and Okuda, A.: (Relative responses of thermal conductivity detector to halocarbons). *Bunseki Kagaku (Jap. Anal.)*, 26 (1977) 121-124.

See also 4530, 4546, 4615, 4696, 4717, 4761.

3b. Column performance and filling studies

- 4526 Ackman, R.G. and Sipos, J.C.: Small components in GLC analysis: The benefits of replacement of metal tubing connectors with glass-lined metal tubing. *J. Chromatogr. Sci.*, 14 (1976) 568-569.
- 4527 Alessi, P., Kikic, I. and Papo, A.: Polarity of phthalate esters in gas chromatography. *J. Chromatogr.*, 131 (1977) 31-40.
- 4528 Ashworth, A.J. and Hooker, D.M.: Mixed solvents in gas-liquid chromatography. Activity coefficients for hexane in squalane and dinonyl phthalate mixtures at 303°K. *J. Chromatogr.*, 131 (1977) 399-403.
- 4529 Bairdovtseva, M.A. and Rudenko, B.A.: (Stability of gas chromatographic columns in the steam flow). *Zh. Anal. Khim.*, 31 (1976) 1739-1742.
- 4530 Berezhkin, V.G., Rudenko, B.A., Popova, T.P., Agayeva, M.N., Lipavsky, V.N., Sokolin, G.F. and Zabokritsky, M.P.: Use of carbon disulphide and formamide as the mobile phase and flame-forming agent in the flame-ionization detector. *J. Chromatogr.*, 130 (1977) 318-319.
- 4531 Einig, R.G. and MacDonald, J.L.: Low resolution glass capillary column for gas chromatography. *Anal. Chem.*, 48 (1976) 2281-2284.
- 4532 Gawdzik, J., Suprynowicz, Z. and Jaroniec, M.: Studies of chromatographic packings comprising chemically bonded phases obtained from porous glass beads. I. Sorption properties and surface heterogeneity. *J. Chromatogr.*, 131 (1977) 7-18.
- 4533 Janik, A.: Multicapillary columns. *J. Chromatogr. Sci.*, 14 (1976) 589.
- 4534 Kaminskii, V.A. and Giorgadze, N.A.: (Peculiarities of the flow of gases and liquids through spiral packings). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 1766-1769 - useful in GC, too.
- 4535 Klein, J. and Widdecke, H.: The influence of the support material and liquid loading on retention indices in gas-liquid chromatography. *J. Chromatogr.*, 129 (1976) 375-378.
- 4536 Korol, A.N.: Selectivity of stationary phases for the resolution of some simple substances. *J. Chromatogr.*, 129 (1976) 125-142.
- 4537 Lauer, H.H., Poppe, H. and Huber, J.F.K.: Application of high-pressure gas chromatography with columns packed with small particles. *J. Chromatogr.*, 132 (1977) 1-16.
- 4538 Leboda, R.: Modification of surface properties of silica gels in view of their application in gas chromatography. VII. Chromatographic studies of the surface properties of silica gels modified with aliphatic alcohols. *Chem. Anal. (Warsaw)*, 21 (1976) 1001-1011.
- 4539 Leboda, R., Suprynowicz, Z. and Waksmundzka-Hajnos, M.: (Modification of surface properties of silica gels in aspect of their utilization in gas chromatography. V. Characteristics of energetic heterogeneity of composite silica-carbon adsorbents surfaces). *Chem. Anal. (Warsaw)*, 21 (1976) 437-448.
- 4540 Leboda, R., Waksmundzki, A., Suprynowicz, Z. and Raszewski, T.: Modification of the surface properties of silica gels as adsorbents in gas chromatography. VI. Xerogels esterified with alcohols as the packing of the chromatographic columns. *Chem. Anal. (Warsaw)*, 21 (1976) 831-844.
- 4541 Leboda, R., Waksmundzki, A., Suprynowicz, Z. and Waksmundzka-Hajnos, M.: (Modification of surface properties of silica gels in aspect of their utility in gas chromatography. IV. New silica-carbon adsorbents). *Chem. Anal. (Warsaw)*, 21 (1976) 165-176.
- 4542 Moriguchi, S., Naito, K. and Takei, S.: Characterization of modified alumina as an adsorbent for gas-solid chromatography. Modification of alumina with alkali-metal fluorides. *J. Chromatogr.*, 131 (1977) 19-29.
- 4543 Nakhutin, I.E. and Linde, Yu.V.: (Effect of longitudinal diffusion on the performance of a radiochromatographic column). *Zh. Fiz. Khim.*, 50 (1976) 1787-1790.

- 4544 Pielichowski, J., Hetper, J. and Kyziol, J.B.: (Possible application of 1,3,6,8-tetrachloro-9-decylcarbazole as the stationary phase in gas chromatography). *Chem. Anal. (Warsaw)*, 21 (1976) 1191-1193.
- 4545 Rayss, J. and Waksmundzki, A.: The contribution of solution and adsorption phenomena in partition GLC systems with mixed stationary phases. III. Relationship between the adsorption properties of the packing and the stationary phase composition. *Chem. Anal. (Warsaw)*, 21 (1976) 1045-1051.
- 4546 Rejthar, L. and Tesarik, K.: Performance characteristics of a system containing a capillary column and an electron-capture detector. *J. Chromatogr.*, 131 (1977) 404-407.
- 4547 Schieke, J.D. and Pretorius, V.: Whisker-walled open-tubular glass columns in gas chromatography. I. Deactivation. *J. Chromatogr.*, 132 (1977) 217-222.
- 4548 Schieke, J.D. and Pretorius, V.: Whisker-walled open-tubular glass columns in gas chromatography. II. Chromatographic performance. *J. Chromatogr.*, 132 (1977) 223-230.
- 4549 Schieke, J.D. and Pretorius, V.: Whisker-walled open-tubular glass columns in gas chromatography. III. Applications. *J. Chromatogr.*, 132 (1977) 231-236.
- 4550 Serpinet, J.: Study of liquid-gas interfacial adsorption by gas chromatography with silanized supports. *Anal. Chem.*, 48 (1976) 2264-2265.
- 4551 Shul'ts, E.Z. and Protasov, V.Ya.: (Analysis of the efficiency of a system of parallel chromatographic columns). *Zh. Fiz. Khim.*, 50 (1976) 191-194.
- 4552 Sukhorukov, O.A., Zakharova, M.V. and Vatulya, N.M.: (Experimental study on the peak broadening of gases adsorbed weakly on a chromatographic column). *Zh. Fiz. Khim.*, 50 (1976) 2110-2112.
- 4553 Suprynowicz, Z. and Tracz, E.: (Properties of Polish supports used in gas chromatography. III. Microscopic investigations of surface structure). *Chem. Anal. (Warsaw)*, 21 (1976) 1089-1097.
- 4554 Vernon, F. and Ogundipe, C.O.E.: Hydrocarbon stationary phases for gas-liquid chromatography. *J. Chromatogr.*, 132 (1977) 181-185.
- 4555 Vigdergauz, M.S. and Bankovskaya, T.R.: The choice of preferred stationary phases for gas chromatography. *Chromatographia*, 9 (1976) 548-553.

See also 4493, 4498, 4568, 4610, 4619.

3c. Apparatus, accessories and materials for GC

- 4556 Coupek, J., Unger, P. and Popl, M.: Properties and use of the sorbent Spheron SDA in gas chromatography. *J. Chromatogr.*, 133 (1977) 91-96.
- 4557 Davydov, E.M. and Kharson, M.S.: (A laboratory device for maintaining a stable concentration of liquid vapour in a gaseous mixture). *Zh. Fiz. Khim.*, 50 (1976) 2984-2985 - useful in GC, too.
- 4558 Dubinin, M.M., Nikolaev, K.M., Polyakov, N.S. and Til'kunov, Yu.N.: (Chromatographic apparatus for studying dynamics of the adsorption of multicomponent mixtures). *Zh. Fiz. Khim.*, 50 (1976) 1039-1041.
- 4559 Dunges, W.: Reflux reactions for chromatography. *Chromatographia*, 9 (1976) 571-573.
- 4560 Fenimore, D.C., Davis, C.M., Whitford, J.H. and Harrington, C.A.: Vapor phase silylation of laboratory glassware. *Anal. Chem.*, 48 (1976) 2289-2290.
- 4561 Ioffe, B.V., Vitenberg, A.G., Marinichev, A.N. and Kuznetsova, L.M.: (Utilization of azeotropic mixtures as standards for the control of gas chromatographic instrumentation). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 1759-1763.
- 4562 Kohler, M. and Hohn, M.: Anwendung einer offenen GC/MS-Kopplung mit Glaskapillarsäulen. *Chromatographia*, 9 (1976) 611-617.
- 4563 Langlais, R., Schlenkermann, R. and Weinberg, M.: Improving the reproducibility of quantitative gas-liquid chromatography by modifying the injection system. *Chromatographia*, 9 (1976) 601-604.
- 4564 McCallum, N.K. and Cairns, E.R.: Simple device for GLC separations of cannabinoids using a surface-coated open tube column without stream splitting. *J. Pharm. Sci.*, 66 (1977) 114-116.
- 4565 Nair, B.M. and Appelqvist, L.-A.: Automatic sample introduction system for gas-liquid chromatographic analysis of amino acids. *J. Chromatogr.*, 133 (1977) 203-209.

- 4566 Schmid, J.P., Schmid, P.P. and Simon, W.: Instrumentation for Curie-point pyrolysis/gas chromatography using high-resolution glass open-tubular columns. *Chromatographia*, 9 (1976) 597-600.
- 4567 Tsuge, S. and Takeuchi, T.: Vertical furnace-type sampling device for pyrolysis gas chromatography. *Anal. Chem.*, 49 (1977) 348-350.
- 4568 Waksmundzki, A., Leboda, R., Suprynowicz, Z. and Ksiezycki, A.: (Modification of surface properties of silica gels for their application in gas chromatography. VIII. Calcined silica gels. *Chem. Anal. (Warsaw)*, 21 (1976) 1323-1332.

See also 4517, 4540, 4541, 4554.

4. TECHNIQUES II

4a. Preparative scale GC

See 4533, 4613.

4b. Programmed-temperature and programmed-pressure GC

- 4569 Le Parlouer, P., Boinon, B. and Vergnaud, J.-M.: Gas chromatography with backflushing, with linear temperature programming in the first direction and a programmed longitudinal positive temperature gradient during the opposite direction of gas flow. *J. Chromatogr.*, 133 (1977) 253-261.

See also 4495, 4537, 4772.

4d. Special microtechniques and functional analysis

- 4570 Evans, M.B. and Newton, R.: Inverse gas chromatography in the study of polymer degradation. Part I. Oxidation of squalene as a model for the oxidative degradation of natural rubber. *Chromatographia*, 9 (1976) 561-566.
- 4571 Franc, J. and Pour, J.: Continuous elemental analysis of nitrogen-containing substances by the use of gas chromatography. *J. Chromatogr.*, 131 (1977) 285-289.
- 4572 Franc, J. and Pour, J.: Continuous elemental analysis of sulphur-containing substances by gas chromatography. *J. Chromatogr.*, 129 (1976) 315-319.
- 4573 Franc, J. and Pour, J.: Identification of substances containing carbon-carbon single bonds by use of reaction gas chromatography. *J. Chromatogr.*, 131 (1977) 291-295.
- 4574 Krasnodebski, P., Grochowski, E. and Boleslawska, T.: (Utilization of silylation mixtures for gas chromatography of sugars, amino acids and steroids). *Przem. Chem.*, 55 (1976) 600-602.

See also 4559, 4603, 4629, 4703, 4777.

4e. Automation

See 4634.

4f. Measurement of physico-chemical and related values

- 4575 Alessi, P., Kikic, I., Papo, A. and Torriano, G.: Evaluation of solvent properties. A comparison of esters of 2-ethylhexanol. *J. Chromatogr.*, 133 (1977) 190-194.
- 4576 Amin, M.I., Koshy, K.T. and Bryan, J.T.: Stability of aqueous solutions of mibolerone. *J. Pharm. Sci.*, 65 (1976) 1777-1779.
- 4577 Azimova, M.I., Narmetova, G.R. and Aripov, E.A.: (Study on thermodynamics of the dissolution of *n*-alkanes by gas-liquid chromatography). *Zh. Fiz. Khim.*, 50 (1976) 1908 - abstract only.
- 4578 Baranski, A., Cieckiewicz, S. and Galuszka, J.: A study of butene-1 transformations on NaHY zeolite by temperature-programmed desorption. *Bull. Acad. Polon. Sci. Ser. Sci. Chim.*, 24 (1976) 645-655.

- 4579 Borovskaya, I.S. and Sidorov, R.I.: (Study on the peculiarities of specific interactions of phenols with hexakis(cyanoethoxy) cyclohexane under the conditions of gas-liquid chromatography). *Zh. Fiz. Khim.*, 50 (1976) 1808-1810.
- 4580 Bratchikov, A.V., Kizhner, D.M., Ryzhova, G.L. and Minaev, B.F.: Study on donor-acceptor interactions of benzoquinones and C₆-C₈ aromatic hydrocarbons. *Zh. Fiz. Khim.*, 50 (1976) 563 - abstract only, address given.
- 4581 Carreno, T.G. and Rubi, J.A.M.: Détermination par chromatographie en phase gazeuse des chaleurs d'adsorption du benzène et de ses dérivés monohalogénés adsorbés sur de la montmorillonite-pyridinium. *J. Chromatogr.*, 133 (1977) 184-189.
- 4582 Choudhary, V.R. and Parande, M.G.: Gas chromatographic study of binary diffusion of nitrobenzene and aniline in hydrogen. *J. Chromatogr.*, 132 (1977) 344-348.
- 4583 Csakvari, B., Fabry, L., Gomory, P. and Ujszaszy, K.: Reactions of chlorosilanes with alkoxy silanes. I. Gas chromatographic and volumetric study of the catalytic condensation, connection between reactivity and mass-spectrometric fragmentation. *Acta Chim. (Budapest)*, 90 (1976) 213-232.
- 4584 Gawdzik, J. and Jaroniec, M.: Determination of the isosteric heat of adsorption by gas adsorption chromatography. *J. Chromatogr.*, 131 (1977) 1-5.
- 4585 Glazunova, L.D., Ostrovskii, V.E. and Sakodinskii, K.I.: (Study on porous structure and character of non-homogeneity of the surfaces of polymeric sorbents). *Zh. Fiz. Khim.*, 50 (1976) 2149-2150.
- 4586 Gryazev, N.N., Rzyanina, T.N., Rakhevskaya, M.N. and Moleva, E.N.: (Study on the adsorption from multicomponent system). *Zh. Fiz. Khim.*, 50 (1976) 2960-2962.
- 4587 Kochkin, Yu.N., Tmenov, D.N. and Shapovalova, L.P.: (Temperature dependence of Henry's coefficients of C₃ hydrocarbons on modified silica gels). *Zh. Fiz. Khim.*, 50 (1976) 983-985.
- 4588 Korol', A.N., Novorusskaya, N.V. and Krivolapov, S.S.: (Molar heats of dissolution of some polar aromatic compounds. Determination by gas-liquid chromatography). *Zh. Fiz. Khim.*, 50 (1976) 1423-1426.
- 4589 Krylov, E.N.: (Specific heats of fluorides of aromatic sulphonic acids in the state of ideal gases). *Zh. Fiz. Khim.*, 50 (1976) 1043 - abstract only; address and report No. given.
- 4590 Leggett, D.C.: Vapor pressure of 2,4,6-trinitrotoluene by a gas chromatographic headspace technique. *J. Chromatogr.*, 133 (1977) 83-90.
- 4591 Monfort, J.P. and Figueiroa, G.L.: Chromatographic determination of isothermal vapor-liquid equilibrium. *J. Chem. Eng. Data*, 21 (1976) 157-162.
- 4592 Mysak, A.E., Voitova, R.A. and Dmitruk, M.O.: (Gas chromatographic determination of hydrophilic-lipophilic equilibrium of polyethylene). *Zh. Fiz. Khim.*, 50 (1976) 2716-2717.
- 4593 Nabivach, V.M. and Venger, L.A.: (Study on thermodynamic functions of the dissolution of pyridine bases by gas-liquid chromatography). *Zh. Fiz. Khim.*, 50 (1976) 805 - abstract only; address and report No. given.
- 4594 Nand, S., Desai, B.K. and Sarkar, M.K.: Chromatographic pulsed micro-reactor system for studying the kinetics of hydrocarbon conversions. *J. Chromatogr.*, 133 (1977) 359-362.
- 4595 Sukhorukov, O.A., Vatulya, N.M. and Nol'de, T.V.: (Gas chromatographic determination of adsorption heats of some compounds by using the first statistical moment). *Zh. Fiz. Khim.*, 50 (1976) 1581-1582.
- 4596 Tolmachev, A.M., Egorov, E.N. and Kotel'nikova, T.A.: (Sorption of microadmixtures. III. Chromatographic method of the determination of the partition coefficient of an admixture and a main component). *Zh. Fiz. Khim.*, 50 (1976) 2696-2698.
- 4597 Tsitsishvili, G.V., Andronikashvili, T.G., Sabelashvili, S.D. and Osipova, N.A.: Chromatographic properties of some silica-rich zeolites. *J. Chromatogr.*, 130 (1977) 13-22.
- 4598 Turek, E.A., Comanita, V.J., Greenkorn, R.A. and Chao, K.-C.: K-values and activity coefficients of some mercaptans and sulfides and a disulfide in hydrocarbon solutions. *J. Chem. Eng. Data*, 21 (1976) 209-211.
- 4599 Valitov, N.Kh., Ibragimov, F.Kh. and Lysikov, V.M.: (Chromatographic study on oxygen and carbon dioxide interactions with a silver catalyst). *Zh. Fiz. Khim.*, 50 (1976) 3160-3163.

- 4600 Valitov, N.Kh., Ibragimov, F.Kh. and Lysikov, V.M.: (Chromatographic study on oxygen interactions with a silver catalyst). *Zh. Fiz. Khim.*, 50 (1976) 1236-1239.
- 4601 Valitov, N.Kh., Ibragimov, F.Kh. and Lysikov, V.M.: (Chromatographic study on water interactions with silver catalyst). *Zh. Fiz. Khim.*, 50 (1976) 2901-2905.
- 4602 Wasik, S.P.: Determination of transition temperatures on sodium stearate using gas chromatography. *J. Chromatogr. Sci.*, 14 (1976) 516-518.
- 4603 Yagud, B.Yu., Teterina, N.N. and Makarevich, N.A.: (Determination of specific surface area of natural sylvite by the thermal desorption method). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 1720-1724.
- 4604 Zakharov, A.P., Gaile, A.A. and Proskuryakov, V.A.: (Dependence of the selectivity on the structure of solvents and components under separation. XVIII. Selectivity of heterocyclic compounds and their acyclic analogues with respect to hydrocarbon systems). *Zh. Fiz. Khim.*, 50 (1976) 1867-1868.

See also 4528, 4536, 4558, 4704.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5a. Gaseous hydrocarbons

See 4762.

5b. Other hydrocarbon types than gaseous

- 4605 Aliev, M.I. and Fisher, S.I.: (Chromatographic behaviour of alkylbenzenes on some stationary phases). *Zh. Fiz. Khim.*, 50 (1976) 1282-1284.
- 4606 Becka, J. and Feltl, L.: Gas chromatographic determination of trace amounts of hydrocarbons in the atmosphere of experimental biological containers. *J. Chromatogr.*, 131 (1977) 179-184.
- 4607 Berezkin, V.G., Fateeva, V.M., Kazakova, Z.A. and Shikalova, I.V.: (Gas chromatographic separation of some cyclic hydrocarbons on squalane coated graphitized carbon black). *Zh. Anal. Khim.*, 31 (1976) 1753-1757.
- 4608 Hanson, R.L., Brookins, D. and Vanderborgh, N.E.: Stoichiometric analysis of oil shales by laser-pyrolysis gas chromatography. *Anal. Chem.*, 48 (1976) 2210-2214.
- 4609 Janini, G.M., Shaikh, B. and Zielinski, Jr., W.L.: Gas-liquid chromatographic analysis of benzo[*a*]pyrene in cigarette smoke on a nematic liquid crystal. *J. Chromatogr.*, 132 (1977) 136-139.
- 4610 Jentoft, R.E. and Gouw, T.H.: Analysis of polynuclear aromatic hydrocarbons in automobile exhaust by supercritical fluid chromatography. *Anal. Chem.*, 48 (1976) 2195-2200.
- 4611 Kuchhal, R.K., Kumar, P., Gupta, P.L. and Mallik, K.L.: Rapid gas chromatographic analysis of aromatics in a cracked fraction, IBP-170°C. *Chromatographia*, 9 (1976) 580-581.
- 4612 Kuras, M., Kubelka, V., Hala, S. and Dolansky, V.: (Character of aromatic hydrocarbons and sulphur-containing compounds in the fraction of Romashkino oil boiling between 200 and 270°C). *Chem. Prum.*, 26 (1976) 588-592.
- 4613 Kyazimov, E.A., Guseinov, M.M., Mishiev, D.E., Mamedov, E.G. and Ahmedov, I.M.: (Identification and preparative chromatographic separation of optically active derivatives of norbornene and cyclohexene. *Zh. Anal. Khim.*, 31 (1976) 2276-2279.
- 4614 Mikolajczak, I.: (Chromatographic data of compounds - impurities of carbochemical naphthalene by gas-liquid chromatography). *Chem. Anal. (Warsaw)*, 21 (1976) 1347-1351.
- 4615 Scheppelle, S.E., Grizzle, P.L., Greenwood, G.J., Marriott, T.D. and Perreira, N.B.: Determination of field-ionization relative sensitivities for the analysis of coal-derived liquids and their correlation with low-voltage electron-impact relative sensitivities. *Anal. Chem.*, 48 (1976) 2105-2113.

See also 4500, 4594, 4772.

5c. Halogen derivatives of hydrocarbons

- 4616 Brinkman, U.A.T. and Reymer, H.G.M.: Polychlorinated naphthalenes. *J. Chromatogr.*, 127 (1976) 203-243 - 176 references, also GC and GC/MS.

See also 4525, 4536, 4590, 4776, 4785.

6. ALCOHOLS

- 4617 Castello, G. and D'Amato, G.: The correlation between the physical properties and structure of alcohols and their gas chromatographic behaviour on polar and non-polar stationary phases. I. C_1-C_8 straight-chain alcohols. *J. Chromatogr.*, 131 (1977) 41-55.
- 4618 Hintze, B., Daniewski, W.M., Krasnodebski, P. and Belzecki, C.: Stereoselectivity of the C-N bond formation. II. Quantitative determination of the mixtures of racemic diastereomeric aminobutanols by gas chromatography. *Bull. Acad. Polon. Sci., Ser. Sci. Chim.*, 24 (1976) 375-379.
- 4619 Swallow, W.H. and Hentschel, P.R.: Limitations in the specificity of Porapak Q columns in the gas chromatographic analysis of ethanol in body fluids. *J. Chromatogr.*, 130 (1977) 403-404.
- 4620 Tagaev, O.A., Stepanov, M.V. and Rudak, V.B.: (Gas chromatographic determination determination of glyceryl mono-, di-, triacetates, allylacetate, acetic acid, and water in their mixtures). *Zh. Anal. Khim.*, 31 (1976) 2268-2271.

See also 4776.

7. PHENOLS

- 4621 Drawert, F. and Leupold, G.: Gas-chromatographische Analyse der Trimethylsilyl-Derivate phenolischer Verbindungen. *Chromatographia*, 9 (1976) 605-610.
- 4622 Kozeiko, T.A. and Kachailo, O.T.: (Study on the modifying effects of some stationary phases on Bentone-34 at the separation of cresols by gas-liquid chromatography on micropacked columns). *Zh. Fiz. Khim.*, 50 (1976) 1347 - abstract only; address and report No. given.
- 4623 Krijgsman, W. and Van de Kamp, C.G.: Determination of chlorophenols by capillary gas chromatography. *J. Chromatogr.*, 131 (1977) 412-416.
- 4624 Paramonova, T.G., Reznikov, S.A., Sidorov, R.I. and Borovskaya, I.S.: (Temperature dependence of retention of phenols and their chromatographic analysis by using Apiezon L as stationary liquid phase). *Zh. Anal. Khim.*, 31 (1976) 1743-1746.
- 4625 Weissmann, G.: Gaschromatographische Trennung von Phenol- und Brenzkatechinmethyläthern. *J. Chromatogr.*, 129 (1976) 431-435.

See also 4579, 4756, 4770.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

- 4626 Buser, H.-R.: Preparation of qualitative standard mixtures of polychlorinated dibenzo-*p*-dioxins and dibenzofurans by ultraviolet and γ -irradiation of the octachloro compounds. *J. Chromatogr.*, 129 (1976) 303-307.
- 4627 Celler, W., Krasuska, E., Malikowska, H. and Maczynski, S.: (GC-MS qualitative analysis of products obtained by catalytical hydrogenation of furfuraldehyde). *Chem. Anal. (Warsaw)*, 21 (1976) 1333-1337.
- 4628 Nayannov, V.P., Zorin, V.V., Zlotskii, S.S., Terent'ev, A.B. and Rakhmankulov, D.L.: (Identification of cyclic acetals and isomeric esters by gas-liquid chromatography). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 2350-2352.

9. OXO COMPOUNDS

- 4629 Cant, P.A.E. and Walker, N.J.: Regeneration of monocarbonyls from their 2,4-dinitrophenylhydrazone derivatives. *J. Chromatogr.*, 130 (1977) 267-273.
4630 Galstyan, G.A., Yakobi, V.A., Rister, A.I. and Galstyan, T.M.: (Study on the chlorination of anthraquinone- α -sulphonic acid in the presence of ozone). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 1330-1333 - retention data.
4631 Hoshika, Y.: Selective and sensitive gas chromatographic determination of benzaldehyde. *J. Chromatogr.*, 129 (1976) 436-439.
4632 Novak, J. and Horakova, J.: Die gaschromatographische Identifizierung von Butyl-3-chlor-2-hydroxypropyläthern und Butylglycidyläthern. *J. Chromatogr.*, 131 (1977) 303-308.

See also 4492, 4628, 4652, 4774, 4778.

10. CARBOHYDRATES

10a. Mono- and oligosaccharides; structural studies

- 4633 Pritchard, D.G. and Todd, C.W.: Gas chromatography of methyl glycosides as their trimethylsilyl ethers. The methanolysis and re-N-acetylation steps. *J. Chromatogr.*, 133 (1977) 133-139.

See also 4574.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

- 4634 Aston, J.W.: Computer processing of fatty acid analysis data. *J. Chromatogr.*, 131 (1977) 121-130.
4635 Dilli, S. and Szyszka, J.: Gas chromatography of the pyrazoline derivative of trimethyl aconitate. *J. Chromatogr.*, 132 (1977) 148-151.
4636 Ellington, J.J., Fisher, P.G., Higman, H.C. and Schepartz, A.I.: GC-MS analysis of fatty acids from flue-cured tobacco. *J. Chromatogr. Sci.*, 14 (1976) 570-573.
4637 Fedyanin, A.A.: (Analysis of free fatty acids (C_5-C_{25}) by capillary chromatography). *Zh. Anal. Khim.*, 31 (1976) 2274-2276.
4638 Gyllenhaal, O., Brotell, H. and Hartvig, P.: Determination of free fatty acids as pentafluorobenzyl esters by electron capture gas chromatography. *J. Chromatogr.*, 129 (1976) 295-302.
4639 Harris, W.S., Marai, L., Myher, J.J. and Subbiah, M.T.R.: Bile acid ethyl esters. Their infrequent formation during routine bile acid analysis and identification by gas chromatography and mass spectrometry. *J. Chromatogr.*, 131 (1977) 437-441.
4640 Kamerling, J.P., Gerwig, G.J., Vliegenthart, J.F.G., Duran, M., Ketting, D. and Wadman, S.K.: Determination of the configurations of lactic and glyceric acids from human serum and urine by capillary gas-liquid chromatography. *J. Chromatogr.*, 143 (1977) 117-123.
4641 Karashima, D., Shigematsu, A., Furukawa, T., Nagayoshi, T. and Matsumoto, I.: Esterification of trifluoroacetic acid with phenyldiazomethane for quantitative gas chromatographic analysis. Methods involving separation from biological materials. *J. Chromatogr.*, 130 (1977) 77-86.
4642 Kojima, T., Morishita, F. and Okano, T.: (Laser pyrolysis gas chromatography of aromatic carboxylic acids; Effect of addition of lithium aluminum hydride). *Bunseki Kagaku (Jap. Anal.)*, 26 (1977) 67-69.
4643 Kringstad, R.: Quantitative determination of phorbic acid by gas-liquid chromatography. *J. Chromatogr.*, 130 (1977) 414-417.

- 4644 Langenbeck, U., Hoinowski, A., Mantel, K. and Möhring, H.-U.: Quantitative gas chromatography and single-ion detection of aliphatic α -keto acids from urine as their O-trimethylsilylquinoxalinol derivatives. *J. Chromatogr.*, 143 (1977) 39-50.
- 4645 Lie Ken Jie, M.S.F.: Fatty acids. XIII. The gas-liquid chromatographic behaviour of dimethylene-interrupted methyl *cis*-octadecenoates. *J. Chromatogr.*, 131 (1977) 239-243.
- 4646 Lie Ken Jie, M.S.F. and Lam, C.H.: Fatty acids. XI. The synthesis of epoxides from methyl octadecadienoates and a study of their chromatographic properties. *J. Chromatogr.*, 129 (1976) 181-191.

See also 4489, 4526, 4620, 4691.

11b. Lipids and their constituents

- 4647 Ip, M.P.C., Draisey, T.F., Thibert, R.J., Gagneja, G.L. and Jasey, G.M.: Fetal lung maturity, as assessed by gas-liquid chromatographic determination of phospholipid palmitic acid in amniotic fluid. *Clin. Chem.*, 23 (1977) 35-40.
- 4648 Kuksis, A.: Routine chromatography of simple lipids and their constituents. *J. Chromatogr.*, 143 (1977) 3-30 - review.
- 4649 Schwab, A.W., Gast, L.E. and Rohwedder, W.K.: Nucleophilic and radical addition of H_2S to methyl linolenate and linseed oil. *J. Amer. Oil Chem. Soc.*, 53 (1976) 762-766.

13. STEROIDS

- 4650 Edmonds, C.G., Smith, A.G. and Brooks, C.J.W.: Analysis of sponge sterols as the trimethylsilyl ethers and as the corresponding 5α - and Δ^3 -ketosteroids using open-tubular gas chromatography-mass spectrometry. Application of selective enzymic oxidation. *J. Chromatogr.*, 133 (1977) 372-377.
- 4651 Gotelli, G.R., Kabra, P.M. and Marton, L.J.: Determination of placental estriol in urine by gas-liquid chromatography, with equilenin as internal standard. *Clin. Chem.*, 23 (1977) 165-168.
- 4652 Kelsey, M.I. and Sexton, S.A.: Isolation and purification of lithocholic acid metabolites produced by the intestinal microflora. *J. Chromatogr.*, 133 (1977) 327-334.
- 4653 Miyazaki, H., Ishibashi, M., Itoh, M., Yamashita, K. and Nambara, T.: Use of silylating agents for the identification of hydroxylated steroids by gas chromatography and gas chromatography-mass spectrometry. Discrimination between phenolic and alcoholic hydroxyl groups. *J. Chromatogr.*, 133 (1977) 311-318.
- 4654 Phillipou, G.: Allyldimethylsilyl ethers. New derivatives for the analysis of steroids by gas chromatography-mass spectrometry. *J. Chromatogr.*, 129 (1976) 384-386.
- 4655 VandenHeuvel, F.A.: Gas-liquid chromatographic studies of reactions and structural relationships of steroids. V. Concurrent substitution in the pregnane side-chain and position 11. *J. Chromatogr.*, 133 (1977) 107-125.

See also 4574.

14. STEROID GLYCOSIDES AND SAPONINS

- 4656 Knight, J.C.: Analysis of Fenugreek sapogenins by gas-liquid chromatography. *J. Chromatogr.*, 133 (1977) 222-225.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

- 4657 Ho, C.H., Griest, W.H. and Guerin, M.R.: Application of the blind assay to biological activity and tobacco smoke terpenes. *Anal. Chem.*, 48 (1976) 2223-2226.
- 4658 Jones, R.A., Neale, M.E. and Ridlington, J.: The chemistry of terpenes. VII. New procedure for the determination of nerol and geranial in essential oils. *J. Chromatogr.*, 130 (1977) 368-371.
- 4659 Kettens-Van den Bosch, J.J. and Saleminck, C.A.: Cannabis. XVI. Constituents of marihuana smoke condensate. *J. Chromatogr.*, 131 (1977) 422-424.
- 4660 Knaus, E.E., Coutts, R.T. and Kazakoff, C.W.: The separation, identification, and quantitation of cannabinoids and their *t*-butyldimethylsilyl, trimethylsilylacetate, and diethylphosphate derivatives using high-pressure liquid chromatography, gas-liquid chromatography, and mass spectrometry. *J. Chromatogr. Sci.*, 14 (1976) 525-530.
- 4661 Ter Heide, R.: Studies on terpenes. III. Gas chromatography of acyclic monoterpenic alcohols. *J. Chromatogr.*, 129 (1976) 143-154.
- 4662 Urbanski, T., Glinka, T. and Wesolowska, E.: On chemical composition of Baltic amber. *Bull. Acad. Polon. Sci., Ser. Sci. Chim.*, 24 (1976) 625-629.
- 4663 Wilkomirski, B. and Kasprzyk, Z.: Gas-liquid chromatographic separation of oxidation products of triterpene pentacyclic alcohols. *J. Chromatogr.*, 129 (1976) 440-443.

See also 4564.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

- 4664 Binder, H. and Stürzenbecher, E.: Gas- und dünnsschicht-chromatographische Untersuchung von Malonsäuredinitril. *J. Chromatogr.*, 130 (1977) 405-409.
- 4665 Gal, J.: Stereochemistry of metabolism of amphetamines: Use of (-)- α -methoxy- α -(trifluoromethyl)phenylacetyl chloride for GLC resolution of chiral amines. *J. Pharm. Sci.*, 66 (1977) 169-172.
- 4666 Habboush, A.E. and Najm, K.A.B.: Separation of monosubstituted benzonitriles by gas-liquid chromatography. *J. Chromatogr.*, 130 (1977) 161-168.
- 4667 Pohlmann, J.L.W. and Cohan, S.L.: Simplified detection of quaternary ammonium compounds by gas chromatography. *J. Chromatogr.*, 131 (1977) 297-301.
- 4668 Tsuda, T., Ichiba, T., Muramatsu, H. and Ishii, D.: Gas-modified solid chromatography using organic vapours as carrier gas. II. Mechanism and application for aromatic amines. *J. Chromatogr.*, 130 (1977) 87-96.

See also 4571, 4618, 4746.

18. AMINO ACIDS

- 4669 Amico, V., Oriente, G. and Tringali, C.: Quantitative analysis of protein and non-protein amino acids by gas-liquid chromatography. *J. Chromatogr.*, 131 (1977) 233-238.
- 4670 Flores, J.J., Bonner, W.A. and Van Dort, M.A.: The gas chromatographic resolution of DL-isovaline. *J. Chromatogr.*, 132 (1977) 152-154.
- 4671 König, W.A., Rahn, W. and Eyem, J.: Gas chromatographic separation of diastereoisomeric amino acid derivatives on glass capillaries. The use of pentafluoropropionyl-amino acid (+)-3-methyl-2-butyl esters. *J. Chromatogr.*, 133 (1977) 141-146.
- 4672 MacKenzie, S.L.: Analysis of methionine in plant materials. Improved gas chromatographic procedure. *J. Chromatogr.*, 130 (1977) 399-402.
- 4673 Siezen, R.J. and Mague, T.H.: Gas-liquid chromatography of the N-heptafluorobutryl isobutyl esters of fifty biologically interesting amino acids. *J. Chromatogr.*, 130 (1977) 151-160.
- 4674 Van Dort, M.A. and Bonner, W.A.: The quantitative gas chromatographic resolution of amino ester diastereomers. *J. Chromatogr.*, 133 (1977) 210-213.

- 4675 Wolfram, J.H., Feinberg, J.I., Doerr, R.C. and Fiddler, W.: Determination of N-nitrosoproline at the nanogram level. *J. Chromatogr.*, 132 (1977) 37-43.

See also 4565, 4574.

19. PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

19a. Peptides

- 4676 Frank, H., Haegele, K.D. and Desiderio, D.M.: Gas chromatography-mass spectrometry study of acetylacetonyl dipeptide methyl esters. *Anal. Chem.*, 49 (1977) 287-291.

19b. Elucidation of structure of proteins

See 4633.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

- 4677 De Leenheer, A.P. and Gijjkens, C.F.: Gas-liquid chromatography of pyrimidine and purine nucleosides as their N,O-permethyl derivatives. *Anal. Chem.*, 48 (1976) 2203-2206.
- 4678 Gehrke, C.W. and Patel, A.B.: Gas-liquid chromatography of nucleosides. Effect of silylating reagents and solvents. *J. Chromatogr.*, 130 (1977) 103-114.
- 4679 Leimer, K.R., Loepky, R.N. and Gehrke, C.W.: Identification of an interfering compound in the gas-liquid chromatographic determination of N₂-dimethylguanosine. *J. Chromatogr.*, 143 (1977) 104-108.
- 4680 Patel, A.B. and Gehrke, C.W.: Derivatization and chromatography of nucleosides and nucleotides. *J. Chromatogr.*, 130 (1977) 115-128.

22. ALKALOIDS

- 4681 Burns, D.T. and Collin, E.J.: Rapid determination of certain alkaloids, other than nicotine, in tobacco. *J. Chromatogr.*, 133 (1977) 378-381.
- 4682 Jain, N.C., Sneath, T.C., Leung, W.J. and Budd, R.D.: Mass screening and confirmation of codeine and morphine in urine by radioimmunoassay-GLC. *J. Pharm. Sci.*, 66 (1977) 66-69.

See also 4734, 4753.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

- 4683 Petrishcheva, G.S., Batukova, G.I., Suchkov, V.V. and Kolomietz, B.S.: (Gas chromatographic determination of 1-hydroxyethyl-2-alkyl-2-imidazolines). *Zh. Anal. Khim.*, 31 (1976) 1774-1776.
- 4684 Zaikin, V.G., Smetanin, V.I., Vul'fson, N.S., Akhrem, A.A. and Ukhova, L.I.: (Chromatography-mass spectrometry for the analysis of stereoisomer mixtures in the series of 1,2-dimethyl- and 1-ethyl-2-methyl-4-alkylperhydroquinolols-4). *Khim. Geterotsikl. Soedin.*, (1976) 1537-1539.

See also 4571, 4593, 4604, 4715, 4771.

24. ORGANIC SULPHUR COMPOUNDS

- 4685 Ciupe, R. and Gavan, M.: Der gaschromatographische Nachweis und die quantitative Bestimmung einer Mischung von 1-Chlor-3-thia-pentan und 3,6-Dithia-octan aus den bei der Synthese dieser Stoffe sich ergebenden Abflusswässern. *Rev. Roum. Chim.*, 21 (1976) 1263-1264.

See also 4572, 4598, 4649, 4766, 4788.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

- 4686 Bruk, A.I., Karabanov, N.T., Nedoshivina, M.B., Vyakhirev, D.A. and Vetrova, Z.P.: (Separation of a mixture of bisarenechromium compounds by gas-liquid chromatography). *Zh. Anal. Khim.*, 31 (1976) 1758-1763.
- 4687 Dilli, S. and Patsalides, E.: Gas chromatography of some oxovanadium(IV) tetridentate β -ketoamine chelates. *J. Chromatogr.*, 130 (1977) 251-259.
- 4688 Kito, A., Nakane, M. and Miyake, Y.: (Gas chromatographic and thermogravimetric analyses of metal chelates of 2-picolyalkylketones). *Bunseki Kagaku (Jap. Anal.)*, 26 (1977) 19-24.
- 4689 Kochetov, V.A., Soucek, I., Markov, B.A., Kirichenko, E.A., Andrianov, K.A. and Khananashvili, L.M.: (Chromatographic analysis of α,ω -dihydrodimethylsiloxanes). *Zh. Anal. Khim.*, 31 (1976) 2252-2255.
- 4690 Ryan, T.R. and Hastings Vogt, C.R.: Determination of physiological levels of Cr(III) in urine by gas chromatography. *J. Chromatogr.*, 130 (1977) 346-350.

See also 4521, 4583.

27. VITAMINS AND VARIOUS GROWTH FACTORS

- 4691 Rosello, J., Tusell, J. and Gelpi, E.: Profiles of prostaglandins A, B, E and F (series I and II) obtained by gas chromatography with multiple-ion detection. *J. Chromatogr.*, 130 (1977) 65-76.

See also 4773.

29. INSECTICIDES AND OTHER PESTICIDES

- 4692 Grove, J. and Martin, B.K.: Gas-liquid chromatography of methylpentynol carbamate and its metabolite 3-methylpentyne-3,4-diol. *J. Chromatogr.*, 133 (1977) 267-272.
- 4693 Guilford, J., Hickman, E. and Ghosh, D.: A simple and sensitive gas-liquid chromatographic method for the determination of *o,p'*-DDD in biological fluids. *J. Chromatogr.*, 133 (1977) 218-221.
- 4694 Hashemy-Tonkabony, S.E. and Soleimani-Amiri, M.J.: Detection and determination of chlorinated pesticide residues in raw and various stages of processed vegetable oil. *J. Amer. Oil Chem. Soc.*, 53 (1976) 752-753.
- 4695 Jensen, S., Renberg, L. and Reutergardh, L.: Residues analysis of sediment and sewage sludge for organochlorines in the presence of elemental sulfur. *Anal. Chem.*, 49 (1977) 316-318.
- 4696 Lawrence, J.F.: A comparison of electron-capture GLC, electrolytic-conductivity GLC and UV-absorption HPLC for the analysis of some herbicides in foods. *J. Chromatogr.*, 14 (1976) 557-559.
- 4697 Nony, C.R., Bowman, M.C., Holder, C.L., Young, J.F. and Oller, W.L.: Trace analysis of 2,4,5-trichlorophenoxyacetic acid, its glycineamide, and their alkaline hydrolyzable conjugates in mouse blood, urine, and feces. *J. Pharm. Sci.*, 65 (1976) 1810-1816.

- 4698 Nose, N., Kobayashi, S., Tanaka, A., Hirose, A. and Watanabe, A.: Determination of thiabendazole by electron-capture gas-liquid chromatography after reaction with pentafluorobenzoyl chloride. *J. Chromatogr.*, 130 (1977) 410-413.
- 4699 Rowe, E.L. and Machkovech, S.M.: Rapid acetylation of a dihydroxy compound by 4-(dimethylamino)pyridine catalysis: Application to GLC determination of clindamycin palmitate hydrochloride. *J. Pharm. Sci.*, 66 (1977) 273-275.
- 4700 Smith, A.E.: Use of acetonitrile for the extraction of herbicide residues from soils. *J. Chromatogr.*, 129 (1976) 309-314.
- 4701 Theobald, J.: Determination of α -chloralose in rodenticide formulations by gas-liquid chromatography. *J. Chromatogr.*, 129 (1976) 444-446.
- 4702 Wien, R.G. and Tanaka, F.S.: Gas chromatography of N-methyl and N-aryl carbamates by flash-heater reaction with trimethylanilinium hydroxide. *J. Chromatogr.*, 130 (1977) 55-63.

See also 4692, 4710, 4773, 4786, 4789.

30. SYNTHETIC AND NATURAL DYES

- 4703 Lanzarini, G., Morselli, L., Pifferi, P.G. and Giumanini, A.G.: Pyrolysis gas chromatography-mass spectrometry for the identification of anthocyanins. *J. Chromatogr.*, 130 (1977) 261-266.

31. PLASTICS AND THEIR INTERMEDIATES

- 4704 Courval, G.J. and Gray, D.G.: Surface and kinetic effects in gas chromatographic studies of polystyrene. *Can. J. Chem.*, 54 (1976) 3496-3507.
- 4705 Fewell, L.L.: Analysis of the thermal reaction products of para polyphenylene by combined gas chromatography-mass spectrometry. *J. Chromatogr. Sci.*, 14 (1976) 564-567.
- 4706 Figge, K., Koch, J. and Lubba, H.: Beitrag zur gaschromatographischen Analyse von Organozinn-Stabilisatoren für Polyvinylchlorid. *J. Chromatogr.*, 131 (1977) 317-327.
- 4707 Lavrent'eva, L.A., Nemova, M.M. and Lakeeva, G.V.: (Gas-liquid chromatographic analysis of polyallyl ethers of pentaerythritol). *Zh. Anal. Khim.*, 31 (1976) 2450-2451.
- 4708 Novikova, I.S., Pervukhina, I.V. and Terent'eva, E.V.: (Gas chromatographic determination of the composition of a mixture of volatile products evolved in the processing of some polymers). *Zh. Anal. Khim.*, 31 (1976) 1747-1752.
- 4709 Szekely, T. and Blazso, M.: Effect of silicon substitution on the thermal stability of polymers. *Acta Chim. (Budapest)*, 88 (1976) 125-128.
- 4710 Takeshita, R., Takabatake, E., Minagawa, K. and Takizawa, Y.: Micro-determination of total phthalate esters in biological samples by gas-liquid chromatography. *J. Chromatogr.*, 133 (1977) 303-310.
- 4711 Webster, R.D.J. and Nickless, G.: Problems in the environmental analysis of phthalate esters. *Proc. Anal. Div. Chem. Soc.*, 13 (1976) 333-335.

See also 4570, 4782, 4783.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. Synthetic drugs and systematic analysis

- 4712 Cockerill, A.F., Hall, M., Mallen, D.N.B., Osborne, D.J. and Prime, D.M.: Analysis of isomeric impurities in a synthesis of the novel anti-inflammatory drug, benoxaprofen. *J. Chromatogr.*, 129 (1976) 339-345.
- 4713 De Graeve, J. and Vanroy, J.: Simultaneous determination of methylated barbiturates and other anticonvulsant drugs by high-resolution gas chromatography. *J. Chromatogr.*, 129 (1976) 171-179.

- 4714 Dusci, L.J. and Hackett, L.P.: Gas chromatographic determination of valproic acid in human plasma. *J. Chromatogr.*, 132 (1977) 145-147.
- 4715 Gupta, R.N., Dobson, K. and Keane, P.M.: Gas-liquid chromatographic determination of primidone in plasma. *J. Chromatogr.*, 132 (1977) 140-144.
- 4716 Hucker, H.B. and Stauffer, S.C.: Determination of various drugs in rodent diet mixtures. *J. Chromatogr.*, 131 (1977) 357-363.
- 4717 Lowry, J.D., Williamson, L.J. and Raisys, V.A.: Micro method for the gas chromatographic determination of serum theophylline utilizing an organic nitrogen sensitive detector. *J. Chromatogr.*, 143 (1977) 83-88.
- 4718 Menez, J.F., Berthou, F., Picart, D., Bardou, L. and Floch, H.H.: Gas chromatographic analysis of dialkylbarbituric acids. *J. Chromatogr.*, 129 (1976) 155-169.
- 4719 Miller, J.J. and Oake, R.J.: Gas-liquid chromatographic determination of niridazole in biological fluids. *J. Chromatogr.*, 131 (1977) 442-443.
- 4720 Rosenfeld, J., Kawai, M., Rigg, J.R.A. and Khandelwal, J.K.: Gas chromatographic method for the analysis of butyrophenones based on the Hofmann degradation reaction. *J. Chromatogr.*, 129 (1976) 387-392.
- 4721 Rudenko, B.A. and Baidarovtseva, M.A.: (Separation efficiency and accuracy of the qualitative analysis of pharmaceuticals by chromatography in the stream of steam). *Zh. Anal. Khim.*, 31 (1976) 2430-2435.
- 4722 Schmitt, K.-F. and Jähnchen, E.: Rapid gas chromatographic determination of underivatized phenprocoumon in plasma. *J. Chromatogr.*, 130 (1977) 418-421.
- 4723 Serfontein, W.J. and De Villiers, L.S.: Quantitative gas chromatographic analysis of barbiturates and hydantoin with quaternary ammonium hydroxides. *J. Chromatogr.*, 130 (1977) 342-345.
- 4724 Steyn, J.M. and Hundt, H.K.L.: Probenecid, a possible interferent in the gas chromatographic determination of diphenylhydantoin. *J. Chromatogr.*, 143 (1977) 207-209.

See also 4576, 4758.

32b. *Metabolism of drugs; toxicological applications*

- 4725 Bailey, E., Fenoughty, M. and Richardson, L.: Automated high-resolution gas chromatographic analysis of psychotropic drugs in biological fluids using open-tubular glass capillary columns. I. Determination of nomifensine in human plasma. *J. Chromatogr.*, 131 (1977) 347-355.
- 4726 Barnhart, J.W. and Caldwell, W.J.: Gas chromatographic determination of hydrocodone in serum. *J. Chromatogr.*, 130 (1977) 243-249.
- 4727 Bayne, W.F., Chu, L.-C. and Tao, F.T.: Subnanogram assay for pilocarpine in biological fluids. *J. Pharm. Sci.*, 65 (1976) 1724-1728.
- 4728 Bechgaard, E. and Lund, J.: Determination of (+)-(3R),(4S)-3-[β (4-methoxyphenoxy)methyl]-1-methyl-4-phenylpiperidine hydrochloride (FG 4963) in biological fluids using competition for adsorption to glass. *J. Chromatogr.*, 133 (1977) 147-152.
- 4729 Benson, G.A. and Spillane, W.J.: Determination of the nonnutritive sweetener sodium cyclopentylsulfamate and three of its metabolites, cyclopentylamine, cyclopentanone, and cyclopentanol, in urine of rats and rabbits. *J. Pharm. Sci.*, 65 (1976) 1841-1843.
- 4730 Braun, W.H.: Rapid method for the simultaneous determination of 1,4-dioxan and its major metabolite, β -hydroxyethoxycetic acid, concentrations in plasma and urine. *J. Chromatogr.*, 133 (1977) 263-266.
- 4731 Cleemann, M.: Gas chromatographic determination of propoxyphene and norpropoxyphene in plasma. *J. Chromatogr.*, 132 (1977) 287-294.
- 4732 Cone, E.J.: General procedure for the isolation and identification of 6- α - and 6- β -hydroxy metabolites of narcotic agonists and antagonists with a hydromorphone structure. *J. Chromatogr.*, 129 (1976) 355-361.
- 4733 Dahl, S.G. and Garle, M.: Identification of nonpolar methotrimeprazine metabolites in plasma and urine by GLC-mass spectrometry. *J. Pharm. Sci.*, 66 (1976) 190-193.
- 4734 De Graeve, J., Van Cantfort, J. and Gielen, J.: Determination of papaverine in blood samples by gas-liquid chromatography and mass fragmentography. *J. Chromatogr.*, 133 (1977) 153-160.

- 4735 Faber, D.B., Kok, R.M. and Rempt-Van Dijk, E.M.: Quantitative gas chromatographic analysis of flunitrazepam in human serum with electron-capture detection. *J. Chromatogr.*, 133 (1977) 319-326.
- 4736 Flanagan, R.J. and Berry, D.J.: Routine analysis of barbiturates and some other hypnotic drugs in the blood plasma as an aid to the diagnosis of acute poisoning. *J. Chromatogr.*, 131 (1977) 131-146.
- 4737 Frigerio, A. and Pantarotto, C.: Quantitative determination of sulpyrid in biological samples from rats by gas-liquid chromatography and chemical ionization-mass fragmentography. *J. Chromatogr.*, 130 (1977) 361-367.
- 4738 Frigerio, A., Pantarotto, C., Franco, R., Gomeni, R. and Morselli, P.L.: Quantitative determination of doxepin and desmethyldoxepin in rat plasma by means of gas-liquid chromatography-mass fragmentography. *J. Chromatogr.*, 130 (1977) 354-360.
- 4739 Garland, W.A.: Quantitative determination of amitriptyline and its principal metabolite, nortriptyline, by GLC-chemical ionization mass spectrometry. *J. Pharm. Sci.*, 66 (1977) 77-81.
- 4740 Gordos, J., Schäublin, J. and Spring, P.: Micro-determination of plasma diphenylhydantoin by gas-liquid chromatography. *J. Chromatogr.*, 143 (1977) 171-181.
- 4741 Hartwig, P. and Näslund, B.: Simultaneous determination of plasma amitriptyline and nortriptyline as trichloroethyl carbamates by electron-capture gas chromatography. *J. Chromatogr.*, 133 (1977) 367-371.
- 4742 Lau, D.H.M. and Henderson, G.L.: Comparative study on the derivatization of λ - α -acetyl-methadol metabolites for electron capture gas-liquid chromatography. *J. Chromatogr.*, 129 (1976) 329-338.
- 4743 Least, Jr., C.J., Wiegand, N.J., Johnson, G.F. and Solomon, H.M.: Quantitative gas-chromatographic flame ionisation method for chloramphenicol in human serum. *Clin. Chem.*, 23 (1977) 220-222.
- 4744 Lennard, M.S., Silas, J.H., Smith, A.J. and Tucker, G.T.: Determination of debrisoquine and its 4-hydroxy metabolite in biological fluids by gas chromatography with flame-ionization and nitrogen-selective detection. *J. Chromatogr.*, 133 (1977) 161-166.
- 4745 Lynn, R.K., Leger, R.M., Gordon, W.P., Olsen, G.D. and Gerber, N.: New gas chromatographic assay for the quantification of methadone. Application in human and animal studies. *J. Chromatogr.*, 131 (1977) 329-340.
- 4746 Mahy, N. and Gelpi, E.: Gas chromatographic separation of histamine and its metabolites. *J. Chromatogr.*, 130 (1977) 237-242.
- 4747 Naestoft, J. and Larsen, N.-E.: Mass fragmentographic quantitation of ethotoxin and some of its metabolites in human urine. *J. Chromatogr.*, 143 (1977) 161-169.
- 4748 Rusch, G.M., LaMendola, S.L., Katz, G.V. and Laskin, S.: Determination of low levels of dimethylcarbamoyl chloride in air. *Anal. Chem.*, 48 (1976) 2259-2261.
- 4749 Sauter, A.M. and Von Wartburg, J.P.: Quantitative analysis of disulfiram and its metabolites in human blood by gas-liquid chromatography. *J. Chromatogr.*, 133 (1977) 167-172.
- 4750 Sheehan, M. and Haythorn, P.: Combined thin-layer and gas-liquid chromatographic identification of tricyclic antidepressants in urine. *J. Chromatogr.*, 132 (1977) 237-247.
- 4751 Smith, R.V., Humphrey, D.W. and Escalona-Castillo, H.: GLC determination of indoprofen in plasma. *J. Pharm. Sci.*, 66 (1977) 132-134.
- 4752 Weinfeld, R.E., Holazo, A. and Kaplan, S.A.: GLC determination of λ -2-hydroxy-N-cyclopropylmethylmorphinan in plasma and urine. *J. Pharm. Sci.*, 65 (1976) 1827-1831.
- 4753 Yeh, S.Y., McQuinn, R.L. and Gorodetzky, C.W.: Identification of diacetylmorphine metabolites in humans. *J. Pharm. Sci.*, 66 (1977) 201-204.
- 4754 Zacchei, A.G. and Wishousky, T.: GLC determination of a novel polyvalent saluretic agent, (6,7-dichloro-2-methyl-1-oxo-2-phenyl-5-indanyloxy)acetic acid, in biological fluids. *J. Pharm. Sci.*, 65 (1976) 1770-1773.
- 4755 Zuleski, F.R., Loh, A. and Di Carlo, F.J.: Assay of human plasma for nortriptyline by radioacetylation and thin-layer chromatography. *J. Chromatogr.*, 132 (1977) 45-49.

See also 4564, 4641, 4659, 4660, 4693, 4714, 4715, 4722, 4757, 4765.

32c. Plant extracts

See 4643, 4656.

32d. Biomedical applications

- 4756 Ehman, J. and Gaucher, G.M.: Quantitation of patulin pathway metabolites using gas-liquid chromatography. *J. Chromatogr.*, 132 (1977) 17-26.
4757 Hill, R.E. and Latham, A.N.: Simultaneous determination of anticonvulsant drugs by gas-liquid chromatography. *J. Chromatogr.*, 131 (1977) 341-346.
4758 Horning, M.G., Brown, L., Nowlin, J., Lertratanangkoon, K., Kellaway, P. and Zion, T.E.: Use of saliva in therapeutic drug monitoring. *Clin. Chem.*, 23 (1977) 157-164.
4759 Jakobs, C., Solem, E., Ek, J., Halvorsen, K. and Jellum, E.: Investigation of the metabolic pattern in maple syrup urine disease by means of glass capillary gas chromatography and mass spectrometry. *J. Chromatogr.*, 143 (1977) 31-38.
4760 Pantarotto, C., Cappellini, L., Negrini, P. and Frigerio, A.: "Epoxide-diol" metabolic pathway of 5H-dibenzo[*a,d*]cycloheptene in the rat. Studies by gas chromatography and mass spectrometry. *J. Chromatogr.*, 131 (1977) 430-436.

See also 4520, 4640, 4667.

33. INORGANIC SUBSTANCES**33a. Permanent and rare gases**

- 4761 Alexander, G. and Garzo, G.: Gas chromatographic analysis of a mixture of N₂, CO, CO₂, Cl₂, HCl and COCl, using a gas density balance detector. *Acta Chim. (Budapest)*, 88 (1976) 329-333.
4762 Elwood, J.H., Robertson, D.J., Gardner, D.G. and Groth, R.H.: Standard reference gases and analytical procedures for use in gas turbine exhaust measurements. *J. Air Pollut. Control Assoc.*, 26 (1976) 1158-1162.
4763 Holland, R.V. and Board, P.W.: Determination of ozone by gas chromatography. *Analyst (London)*, 101 (1976) 887-891.
4764 Nandi, S.P. and Walker, Jr., P.L.: Separation of oxygen and nitrogen using 5A zeolite and carbon molecular sieves. *Separ. Sci.*, 11 (1976) 441-453.

See also 4519, 4599, 4699, 4772.

33b. Volatile inorganic substances

- 4765 Derkx, C.M.: Improvement in the determination of sulphur hexafluoride for use as a blood tracer. *J. Chromatogr.*, 133 (1977) 428-429.
4766 De Souza, T.L.C. and Bhatia, S.P.: Development of calibration systems for measuring total reduced sulfur and sulfur dioxide in ambient concentrations in the parts per billion range. *Anal. Chem.*, 48 (1976) 2234-2240.
4767 Sakano, T., Hori, Y. and Tomari, Y.: Gas chromatographic determination of trace amounts of water in organic solvent containing active chlorine and hydrogen chloride. *J. Chromatogr. Sci.*, 14 (1976) 501-504.

See also 4761, 4762.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 4768 Davydov, A.V., Travnikov, S.S. and Myasoedov, B.F.: (Application of distillation of chlorides in radiochemical analysis). *Chem. Anal. (Warsaw)*, 21 (1976) 41-49 - chromatography.
4769 Matucha, M. and Smolкова, E.: Gas chromatography of ³H- and ¹⁴C-labelled compounds. *J. Chromatogr.*, 127 (1976) 163-201 - review, 431 references.

See also 4519, 4543, 4682.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35b. Antioxidants and preservatives

- 4770 Dilli, S. and Robards, K.: Comparative gas chromatographic behaviour and detection limits of 2,6-di-*tert*-butyl-4-methylphenol, 3-*tert*-butyl-4-hydroxyanisole (BHA), and the trifluoroacetate of BHA. *J. Chromatogr.*, 133 (1977) 363-366.
- 4771 Winell, B.: Quantitative determination of ethoxyquin in apples by gas chromatography. *Analyst (London)*, 101 (1976) 883-886.

See also 4710, 4783.

35c. Complex mixtures and non-identified compounds

- 4772 Guberska, J., Draniak, B. and Szostak, A.: (The possibility of gas chromatography application to the determination of *o*-xylene and naphthalene oxidation products). *Chem. Anal. (Warsaw)*, 21 (1976) 1161-1169.
- 4773 Lawrence, J.F. and Ryan, J.J.: Comparison of electron-capture and electrolytic-conductivity detection for the gas-liquid chromatographic analysis of heptafluorobutyl derivatives of some agricultural chemicals. *J. Chromatogr.*, 130 (1977) 97-102.
- 4774 Malikowska, H., Otwinowska, H. and Gorczynska, K.: (Gas chromatographic-mass spectrometric qualitative analysis of impurities in technical acetone obtained by cumene method). *Chem. Anal. (Warsaw)*, 21 (1976) 129-137.
- 4775 Roy, T.A. and Szinai, S.S.: Pyrolysis GLC identification of food and drug ingredients. II. Qualitative and quantitative analysis of penicillins and cephalosporins. *J. Chromatogr. Sci.*, 14 (1976) 580-584.
- 4776 Stojanowa-Antoszczyszyn, M., Myszkowski, J., Zielinski, A.Z. and Krawczyk, D.: (Studies on the regulation of butadiene tetrahydroxylation into dichlorobutanediols). *Przem. Chem.*, 55 (1976) 202-205.
- 4777 Stretton, R.J., Campbell, M. and Burns, D.T.: Pyrolysis gas chromatography as an aid to the identification of *Aspergillus* species. *J. Chromatogr.*, 129 (1976) 321-328.
- 4778 Upadysheva, A.V., Zaitseva, Z.V., Zel'manova, Z.I., Lukhina, A.S., Kashnikov, A.M. and Znamenskaya, A.P.: (Study on the composition of by-products from 2-ethylhexen-2-al hydrogenation). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 688-691.

35d. Air pollution

- 4779 Cautreels, W. and Van Cauwenbergh, K.: Fast quantitative analysis of organic compounds in airborne particulate matter by gas chromatography with selective mass spectrometric detection. *J. Chromatogr.*, 131 (1977) 253-264.
- 4780 Drugov, Yu.S. and Murav'eva, G.V.: (Gas chromatographic analysis of air polluted with the products from rosin decomposition). *Zh. Anal. Khim.*, 31 (1976) 2205-2211.
- 4781 Hill, Jr., H.H., Chan, K.W. and Karasek, F.W.: Extraction of organic compounds from airborne particulate matter for gas chromatographic analysis. *J. Chromatogr.*, 131 (1977) 245-252.
- 4782 Toyosawa, S., Umezawa, Y., Ikoma, K., Kameyama, Y., Shirai, T. and Yanagisawa, S.: (Analysis of tire tread rubber in airborne particulate matter by pyrolysis-gas chromatography). *Bunseki Kagaku (Jap. Anal.)*, 26 (1977) 38-42.
- 4783 Yamasaki, H. and Kuwata, K.: (Collection of atmospheric phthalate esters using polyurethane foam flugs). *Bunseki Kagaku (Jap. Anal.)*, 26 (1977) 1-5.

See also 4606, 4766.

35e. Water pollution

- 4784 Gloor, R. and Leidner, H.: Bestimmung von Carbonsäuren aus wässriger Lösung mittels Kapillar-Gas-Chromatographie. *Chromatographia*, 9 (1976) 618-623.

- 4785 Kaiser, K.L.E. and Oliver, B.G.: Determination of volatile halogenated hydrocarbons in water by gas chromatography. *Anal. Chem.*, 48 (1976) 2207-2209.
- 4786 McNeil, E.E., Otson, R., Miles, W.F. and Tajabalee, F.J.M.: Determination of chlorinated pesticides in potable water. *J. Chromatogr.*, 132 (1977) 277-286.
- 4787 Stancher, B., Tunis, F. and Favretto, L.: Chromatographic studies on the extraction of polyoxyethylene alkylphenyl ether non-ionic surfactants from water at trace levels. *J. Chromatogr.*, 131 (1977) 309-316.
- 4788 Vitenberg, A.G., Butaeva, I.L., Kuznetsova, L.M. and Inshakov, M.D.: (Gas chromatographic determination of microimpurities of sulphur compounds in industrial waste waters). *Zh. Prikl. Khim. (Leningrad)*, 49 (1976) 1476-1481.
- 4789 Witek, S. and Mierzwa, S.: (Determination of residues of diethyl 1-(2',4'-dichlorophenyl)-2-chlorovinylphosphate (chlorfenvinphos) in water by gas chromatography with electron capture detection). *Chem. Anal. (Warsaw)*, 21 (1976) 715-721.

See also 4711, 4784.

Liquid Column Chromatography

1. REVIEWS AND BOOKS

- 4790 Dybczynski, R.: (Some fundamental problems of ion exchange chromatography their significance for chemical analysis and radiochemistry). *Nukleonika*, 21 (1976) 547-564; *C.A.*, 86 (1977) 25433g.
- 4791 Epton, R.: Permeation chromatography of organic solutes using enzacryl gel packings. *Aldrichimica Acta*, 9 (1976) 23-27; *C.A.*, 85 (1976) 171285f.
- 4792 Hattano, H.: (Radical chromatography). *Kagaku No Ryoiki*, 30 (1976) 612-619; *C.A.*, 86 (1977) 25648f.
- 4793 Knox, J.H.: High pressure liquid chromatography - the present situation. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 1-9; *C.A.*, 85 (1976) 173603g.
- 4794 Lawrence, J.F. and Frei, R.W.: *Chemical Derivatization in Liquid Chromatography*, (Journal of Chromatography Library, Vol. 7), Elsevier, Amsterdam, Oxford, New York, 1976, VII + 213 pp.; *C.A.*, 85 (1976) 201727w.
- 4795 Melikhov, I.V. and Berdonosova, D.G.: (Sorption by inorganic sorbents in analytical chemistry). *Zh. Anal. Khim.*, 31 (1976) 809-813; *C.A.*, 85 (1976) 171054e.
- 4796 Simpson, C.F.: Practical experiments in HPLC with typical results. In: C.F. Simpson (Editor), *Practical High Performance Liquid Chromatography*, Heyden & Son, London, 1976, 214 pp. 223-268; *C.A.*, 85 (1976) 176235z.

See also 4839, 4852, 4862, 4891, 4898, 4916, 1917.

2. FUNDAMENTALS, THEORY AND GENERAL

2a. General

- 4797 Gribnau, T.C.J. and Eekelen, C.A.G., Stumm, C. and Tesser, G.I.: Microscopic observations on agarose beads. Dehydration by solvent exchange as an alternative to lyophilization. *J. Chromatogr.*, 132 (1977) 519-524.
- 4798 Kalinichev, A.I.: (Method of moments in the theory of non-equilibrium elutative dynamics of sorption of one substance on a nonlinear isotherm). *Zh. Fiz. Khim.*, 50 (1976) 1839-1841; *C.A.*, 86 (1977) 8959r.

- 4799 Kotaka, T., Suzuki, H. and Inagaki, H.: Gel permeation chromatography: Band-broadening and skewing in high speed gel permeation chromatography. *Bull. Inst. Chem. Res., Kyoto Univ.*, 54 (1976) 100-111; *C.A.*, 85 (1976) 143698z.
- 4800 Morris, C.J.O.R.: Hydrophobic interaction chromatography. *Trends Biochem. Sci.*, 1 (1976) N207-N208; *C.A.*, 85 (1976) 173585c.
- 4801 Soczewinski, E.: Solvent composition effects in liquid-solid systems. *J. Chromatogr.*, 130 (1977) 23-28.
- 4802 Soczewinski, E., Dzido, T., Golkiewicz, W. and Gazda, K.: Comparison of high-performance liquid chromatographic and thin-layer chromatographic data obtained with various types of silica. *J. Chromatogr.*, 131 (1977) 408-411 - silica.
- 4803 Stein, A.N.: The king's companions - a chromatographical allegory. *J. Chem. Educ.*, 53 (1976) 646; *C.A.*, 86 (1977) 29019z.
- 4804 Stoisits, R.F., Poehlein, G.W. and Vanderhoff, J.W.: Mathematical modeling of hydrodynamic chromatography. *J. Colloid Interface Sci.*, 57 (1976) 337-344; *C.A.*, 85 (1976) 182793w.
- 4805 Waldmann-Meyer, H.: The geometrical chromatography model proven by pore radius determinations in porous glasses. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 691-693; *C.A.*, 85 (1976) 118983f.

2b. Measurement of physicochemical and related values

- 4806 Blagrove, R.J. and Frenkel, M.J.: Determination of protein molecular weights in denaturing solvents using glyceryl-CPG. *J. Chromatogr.*, 132 (1977) 399-404.
- 4807 Haller, W., Basedow, A.M. and König, B.: General permeation chromatography equation and its application to taylor-made controlled pore glass columns. *J. Chromatogr.*, 132 (1977) 387-397.
- 4808 Shinnar, R. and Weiss, G.H.: A note on the resolution of two Gaussian peaks. *Separ. Sci.*, 11 (1976) 377-383.

3. TECHNIQUES I

3a. Detectors

- 4809 Bachman, A. and Vestergaard, P.: Electronic system for chart recorder absorbance output of the multicuvette system for liquid chromatography. *J. Chromatogr.*, 132 (1977) 335-338.
- 4810 De Mey, II, C.F. and Helms, C.C.: Detector cell device for a spectrophotometer for liquid chromatography. *Ger. Pat.*, 2,604,302 (1976); *C.A.*, 85 (1976) 1863111k.
- 4811 Lemar, M. and Porthault, M.: Détection ampérométrique en chromatographie liquide à haute performance dans le cas d'éluants non conducteurs. *J. Chromatogr.*, 130 (1977) 372-377.
- 4812 Lemar, M., Versaud, P. and Porthault, M.: Détection par spectrométrie infrarouge en chromatographie liquide à haute performance. *J. Chromatogr.*, 132 (1977) 295-301.
- 4813 Martin, F., Maine, J., Sweeley, C.C. and Holland, J.F.: The free-falling drop detector - a novel fluorescence detector for high-performance liquid chromatography. *Clin. Chem. (Winston-Salem, N. C.)*, 22 (1976) 1434-1437; *C.A.*, 85 (1976) 139386d.
- 4814 Poppe, H. and Kuysten, J.: Construction and evaluation of a thermostatted permittivity detector for high-performance column liquid chromatography. *J. Chromatogr.*, 132 (1977) 369-378.
- 4815 Smith, R.N. and Zetlein, M.: Use of dual-wavelength detection in high-pressure liquid chromatography for the quantitative determination of unresolved or partially resolved compounds. *J. Chromatogr.*, 130 (1977) 314-317.

See also 4878, 4925, 5122.

3b. Sorbents, Carriers, Buffers and packing procedures

- 4816 Bar, D.C.M. and Rosset, R.: (Packing of columns of porous silica microparticles for high-speed liquid chromatography). *Analysis*, 4 (1976) 108-114; *C.A.*, 85 (1976) 162382h.
- 4817 Gawdzik, J., Suprynowicz, Z. and Jaroniec, M.: Studies of chromatographic packings comprising chemically bonded phases obtained from porous glass beads. I. Sorption properties and surface heterogeneity. *J. Chromatogr.*, 131 (1977) 7-18 - porous glass.
- 4818 Gozdzicka-Jozefiak, A. and Augustyniak, J.: Preparation of chelating exchangers with a polysaccharide network and low cross-linkage. *J. Chromatogr.*, 131 (1977) 91-97.
- 4819 Hori, M.: (Packing materials for high-speed liquid chromatography). *Farumashia*, 12 (1976) 529-531; *C.A.*, 86 (1977) 6726p.
- 4820 Hunt, D.C., Wild, P.J. and Crosby, N.T.: Phthalimidopropylsilane - a new chemically bonded stationary phase for the determination of polynuclear aromatic hydrocarbons by high-pressure liquid chromatography. *J. Chromatogr.*, 130 (1977) 320-323.
- 4821 Jennissen, H.P.: Basic properties of hydrophobic agaroses. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 675-679; *C.A.*, 85 (1976) 118981d.
- 4822 Kroebel, R. and Meyer, A.: Absorbents based on synthetic resins. *U. S. Pat.*, 3,960,762 (1976); *C.A.*, 85 (1976) 161469e.
- 4823 Semechkin, A.V., Rogozhin, S.V. and Davankov, V.A.: Ligand-exchange chromatography of racemates. IV. Influence of stationary-complex structure on the mechanism of ligand exchange. *J. Chromatogr.*, 131 (1977) 65-72 - styrene polymer, preparation described.
- 4824 Wilson, M.B. and Nakane, P.K.: The covalent coupling of proteins to periodate-oxidized Sephadex: a new approach to immunoabsorbent preparation. *J. Immunol. Methods*, 12 (1976) 171-181; *C.A.*, 85 (1976) 118992h.

See also 4800, 4869.

3c. Apparatus, accessories and operation

- 4825 Achener, P., Abbott, S.R. and Stevenson, R.L.: An experimental evaluation of compressibility effects in syringe pumps for liquid chromatography. *J. Chromatogr.*, 130 (1977) 29-40.
- 4826 Beller, N.R. and Hilleary, C.J.: A sample preparation technique for column chromatography. *J. Chem. Educ.*, 53 (1976) 498; *C.A.*, 85 (1976) 142052x.
- 4827 Berek, D.: A simple pulse damper for liquid chromatography. *J. Chromatogr.*, 132 (1977) 128-129.
- 4828 Bristow, P.A., Brittain, P.N., Riley, C.M. and Williamson, B.F.: Upward slurry packing of liquid chromatography columns. *J. Chromatogr.*, 131 (1977) 57-64.
- 4829 Chen, T.H., Rastogi, A.K., Kim, C.Y. and Rak, J.L.: Nonequilibrium parametric pumps. *Separ. Sci.*, 11 (1976) 335-346.
- 4830 Janca, J. and Kolinsky, M.: Coupling of a gel-permeation chromatograph and an automatic capillary viscometer. I. Influence of the column efficiency. *J. Chromatogr.*, 132 (1977) 187-193.
- 4831 Knox, J.H.: Improved method and apparatus for liquid chromatography. *Brit. Pat.*, 1,441,462 (1976); *C.A.*, 85 (1976) 194637m.
- 4832 Lee, H.L. and Lightfoot, E.N.: Preliminary report on ultrafiltration-induced polarization chromatography - an analog of field-flow fractionation. *Separ. Sci.*, 11 (1976) 417-440.
- 4833 Martin, M., Guiochon, G., Blu, G. and Eon, C.: The compressibility effects in syringe pumps for liquid chromatography. *J. Chromatogr.*, 130 (1977) 458-459.
- 4834 Schauer, M. and Hansen, G.: (The automatic separation of fractions using and electronic comparator). *Z. Med. Labortech.*, 17 (1976) 128-134; *C.A.*, 85 (1976) 119018g.

See also 4940.

4. TECHNIQUES II

4a. Preparative procedures (including affinity chromatography)

- 4835 Best-Belpomme, M., Richard-Foy, H., Seccomillet, C. and Baulieu, E.E.: Affinity chromatography of the uterine estradiol receptor on estradiol-PAB-cellulose: an artefact. *Biochimie*, 58 (1976) 863-869; *C.A.*, 85 (1976) 139336n.
- 4836 Campbell, W.H.: Separation of soybean leaf nitrate reductases by affinity chromatography. *Plant Sci. Lett.*, 7 (1976) 239-247; *C.A.*, 85 (1976) 139056w.
- 4837 Cremonesi, P. and Bovara, R.: High performance enzyme reactors. *Biotechnol. Bioeng.*, 18 (1976) 1487-1491; *C.A.*, 85 (1976) 173664c.
- 4838 Feger, J., Biou, D., Durand, G. and Agneray, J.: Application of immuno-affinity chromatography to the removal of contaminants and to the ultimate purification of a glycoprotein. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 559-563; *C.A.*, 85 (1976) 118973c.
- 4839 Guilford, H.: Bioaffinity chromatography. In: C.F. Simpson (Editor), *Practical High Performance Liquid Chromatography*, Heyden & Son, London, 1976, pp. 193-206; *C.A.*, 85 (1976) 138961a.
- 4840 Gynes, L. and Ganguli, P.K.: The use of affinity chromatography for the subfractionation of polyadenylated RNA on oligo(dT)-cellulose. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 651-658; *C.A.*, 85 (1976) 118978h - oligo(dT)-cellulose.
- 4841 Ho, P.P.K. and Towner, R.D.: Affinity chromatography of 15-hydroxyprostaglandin dehydrogenase from dog lung. *Prep. Biochem.*, 6 (1976) 215-222; *C.A.*, 85 (1976) 118599k.
- 4842 Kassell, B., Wright, C.L. and Ward, P.H.: Affinity chromatography of polylysine-Sepharose 4B. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 541-544; *C.A.*, 85 (1976) 118486w.
- 4843 Kawai, K. and Eguchi, Y.: Affinity chromatography of glucose 6-phosphate dehydrogenase on the blue dextran-Sepharose. *Hakko Kogaku Zasshi*, 54 (1976) 609-613; *C.A.*, 85 (1976) 118576a.
- 4844 Klor, H.U., Schmidt, J.W., Ditschuneit, H. and Glomset, J.: Affinity chromatography of lipoproteins with heparin-agarose. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 581-588; *C.A.*, 85 (1976) 118976f.
- 4845 Konno, T. and Hirai, H.: A simple method for isolation of human prooprin by affinity chromatography. *J. Immunol. Methods*, 12 (1976) 47-55; *C.A.*, 85 (1976) 118993j.
- 4846 Kristiansen, T.: Virus purification by *Vicia ervilia* lectin coupled to Sepharose. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 663-665; *C.A.*, 85 (1976) 118979j.
- 4847 Lacko, A.G. and Chen, T.F.: Enzyme purification by affinity chromatography using a non-covalently bound adsorbent. *J. Chromatogr.*, 130 (1977) 446-450 - dodecylamine agarose.
- 4848 Martin, S.J. and Ter Meulen, V.: A rapid method for the quantitative study of RNA from canine distemper virus infected cells. *J. Gen. Virol.*, 32 (1976) 321-325; *C.A.*, 85 (1976) 119201m.
- 4849 Meyer, D., Fressinaud, E., Dreyfus, M. and Larriev, M.J.: Study of human factor IX. Variants with an immunoadsorption technique. *Boerhaave Ser. Postgrad. Med. Educ.*, 10 (1975) 264-273; *C.A.*, 85 (1976) 140976c - CNBr-Sepharose.
- 4850 National Research Development Corp.: Preparative chromatographic separation. *Neth. Pat.*, 75 07,765 (1976); *C.A.*, 86 (1977) 19005c.
- 4851 Neame, P.J., Doley, S.G., Harvey, M.J. and Dean, D.D.G.: Some microscopic observations on matrix structure in affinity chromatography. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 513-516; *C.A.*, 85 (1976) 118971a.
- 4852 Okuyama, T. and Mitsuki, K.: (New technology for utilizing enzymes. I. Affinity chromatography of enzymes). *Kagaku To Seibutsu*, 14 (1976) 597-606; *C.A.*, 86 (1977) 13029s - a review with 44 refs.
- 4853 Page, M.: Separation of oncofetal proteins by affinity chromatography. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 565-570; *C.A.*, 85 (1976) 118974d.
- 4854 Pahud, J.J. and Hilpert, H.: Affinity chromatography of lactoferrin on immobilized ferritin. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 571-574; *C.A.*, 85 (1976) 118975e.

- 4855 Plate, N.A. and Matrosovich, M.N.: (Affinity chromatography of serum albumin on synthetic adsorbents). *Dokl. Akad. Nauk SSSR*, 229 (1976) 496-499; *C.A.*, 85 (1976) 139312b.
- 4856 Scott, D.W.: Antifluorescein affinity columns. Isolation and immunocompetence of lymphocytes that bind fluoresceinated antigens *in vivo* or *in vitro*. *J. Exp. Med.*, 144 (1976) 69-78; *C.A.*, 85 (1976) 121510e.
- 4857 Shumate, S.E. and Scott, C.D.: Centrifugal system for affinity chromatography with eluate monitoring. *Clin. Chem.*, 22 (1976) 1493-1496; *C.A.*, 85 (1976) 173621m.
- 4858 Snoeren, T.H.M., Van der Spek, C.A. and Payens, T.A.J.: Preparation of κ - and minor α -casein by electrostatic affinity chromatography. *Biochim. Biophys. Acta*, 490 (1977) 255-259 - electrostatic affinity chromatography, Amberlite G-50.
- 4859 Suttnar, J., Hrkal, Z. and Vodrazka, Z.: Affinity chromatography of serum haemopexin. *J. Chromatogr.*, 131 (1977) 453-457 - Bio-Gel P-200 with bound haeme.
- 4860 Van der Loo, W. and Hamers, R.: Scaling up immunoaffinity chromatography by automation. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 603-608; *C.A.*, 85 (1976) 118977g.

See also 4888, 4977, 5005, 5015, 5025, 5026, 5028, 5030, 5036, 5037, 5040, 5044, 5050, 5051, 5053, 5057, 5058, 5061, 5063, 5066, 5067, 5070, 5075, 5078, 5081, 5085, 5091, 5094.

4b. Automation and continuous procedures

- 4861 Bauman, F., Peczar, R.E., Wadsworth, B. and Thompson, F.: Automation of sample introduction in chromatography. *Amer. Lab.*, 8 (1976) 97-98; *C.A.*, 85 (1976) 171287h.
- 4862 Sussman, M.V.: Continuous chromatography. A status report. *Chem. Tech.*, 6 (1976) 260-264; *C.A.*, 85 (1976) 96242j.

See also 4860.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

- 4863 Berg, R.G. and McNair, H.M.: Preparative high-performance liquid chromatographic separation of high-molecular-weight isomers. *J. Chromatogr.*, 131 (1977) 185-190 - LiChrosorb Si-100.
- 4864 Higashi, K. and Hagihara, K.: Characterization and identification of spilled oils by high-speed gel permeation chromatography using ultraviolet absorption detector. *Bunseki Kagaku (Jap. Anal.)*, 25 (1976) 803-805 - HSG-15 gel.
- 4865 Langmaack, H.J. and Sucker, H.: (Gel chromatographic petroleum separation of branched hydrocarbons from petrolatum 10 : influence of chemical and physical data on the practical properties of petrolatum). *Fette, Seifen, Anstrichm.*, 78 (1976) 263-269; *C.A.*, 86 (1977) 19274q.
- 4866 Popl, M., Dolansky, V., Coupek, J.: Chromatography of aromatic hydrocarbons on macroporous polystyrene gel. *J. Chromatogr.*, 130 (1977) 195-204 - macroporous polystyrene gel.

7. PHENOLS

- 4867 Court, W.A.: High-performance reversed-phase liquid chromatography of naturally occurring phenolic compounds. *J. Chromatogr.*, 130 (1977) 287-291 - μ Bondapak C¹⁸.
- 4868 Dadic, M. and Belleau, G.: Analytical methods for polyphenols in brewing. V. Chromatography and spectroscopy of tanninogens in malt and beer. *J. Amer. Soc. Brew. Chem.*, 34 (1976) 158-165; *C.A.*, 86 (1977) 28423q - silica gel.

- 4869 Dequire, P., Audebert, R. and Quivoron, C.: (Crosslinking of poly(vinylpyrrolidinone) on an inorganic support: use as a pellicular phase in high-pressure liquid-liquid chromatography). *Doc. Prep., Journ. Etude Prog. Recents Methodes Anal. Qual., Quant. Struct. Polyphenols Assem. Gen. Groupe - Groupe Polyphenols*, 10 CLHP (1976) 7-8; *C.A.*, 85 (1976) 153532e.
- 4870 Kauffman, P.: The separation of butylated hydroxyanisole isomers on Sephadex LH-20. *J. Chromatogr.*, 132 (1977) 356-358 - Sephadex LH-20.
- 4871 Martin, G.E., Quinand, C.G. and Figert, D.M.: (Comparison of gas-liquid, gas-solid, liquid-liquid, and liquid-solid chromatographic techniques in analysis of vanillin and ethylvanillin in alcoholic solution). *Doc. Prep., Journ. Etude Prog. Recents Methodes Anal. Qual., Quant. Struct. Polyphenols Assem. Gen. Groupe - Groupe Polyphenols*, 10 CLHP (1976) 9-10; *C.A.*, 85 (1976) 153538m.
- 4872 Shopova, B.I., Mladenov, I.T. and Kurtev, K.S.: Elution behaviour of some derivatives of 2-(4-hydroxyphenyl)-2-phenylpropane on Sephadex LH-20 in methanol and N,N-dimethylformamide. *J. Chromatogr.*, 132 (1977) 99-103 - Sephadex LH-20.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

- 4873 Fasco, J.J., Piper, L.J. and Kaminsky, L.S.: Biochemical applications of a quantitative high-pressure liquid chromatographic assay of warfarin and its metabolites. *J. Chromatogr.*, 131 (1977) 365-373 - μ Bondapak C₁₈.
- 4874 Numan, H., Helder, R. and Wynberg, H.: The resolution of heterohelicones, a facile method using HPLC (high pressure liquid chromatography). *Recl. Trav. Chim. Pays-Bas*, 95 (1976) 211-212; *C.A.*, 86 (1977) 29680h.
- 4875 Takahashi, D.M.: Reversed-phase high-performance liquid chromatographic analytical system for aflatoxins in wines with fluorescence detection. *J. Chromatogr.*, 131 (1977) 147-156 - silica, different types of bonded phases.
- 4876 Valentine, J.L., Bryant, P.J., Gutshall, P.L., Gan, O.H.M. and Driscoll, P.: Quantification of trace substances in biological samples using HPLC-MS techniques. *Trace Subst. Environ. Health*, 9 (1975) 291-296; *C.A.*, 76 (1977) 25772s.
- 4877 Wilkinson, M., Sweeny, J.G. and Iacobucci, G.A.: High-pressure liquid chromatography of anthocyanidins. *J. Chromatogr.*, 132 (1977) 349-351 - μ Bondapak C₁₈.
- 4878 Zimmerli, B.: Verbesserung der Nachweisgrenze von Aflatoxinen in der Hochdruck-flüssigkeits-chromatographie durch Verwendung eines kieselgefüllten Fluoreszenzdetektors. *J. Chromatogr.*, 131 (1977) 458-463 - μ Porasil, μ Bondapak CN, μ Bondapak C₁₈.

9. OXO COMPOUNDS

- 4879 Piergiovanni, L. and Volonterio, G.: (Analysis of carbonyl compounds by reversed-phase liquid chromatography). *Riv. Ital. Sostanze Grasse*, 53 (1976) 99-101; *C.A.*, 85 (1976) 121892f - C₁₈-silica.
- 4880 Rittich, B. and Krska, M.: Separation of quinones and their derivatives by high-performance liquid chromatography. *J. Chromatogr.*, 130 (1977) 189-194 - Sephadex LH-20.

10. CARBOHYDRATES

10a. Mono- and Oligosaccharides; structural studies

- 4881 Bauer, H. and Voelter, W.: (Carbohydrates. 52. Ion-exchange chromatography of carbohydrates). *Chromatographia*, 9 (1976) 433-439; *C.A.*, 86 (1977) 30016c.
- 4882 Birch, C.G. and Crowe, F.E.: Determination of sucrose polyesters by high performance gel permeation chromatography. *J. Amer. Oil Chem. Soc.*, 53 (1976) 581-583; *C.A.*, 85 (1976) 173620k.

- 4883 Feizi, T., Gough, P. and Williamson, P.: Separation of oligosaccharides. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 41-43; C.A., 85 (1976) 173641t - μ Bondapak.
- 4884 McGinnis, G.D. and Fang, P.: The separation of substituted carbohydrates by high-performance liquid chromatography. *J. Chromatogr.*, 130 (1977) 181-187 - Poragel 60 Å.
- 4885 Schmidt, F. and Enevoldsen, B.S.: Gel filtration chromatography of oligosaccharides. Comparative studies of α -1,4, α -1,6 and α -1,4, α -1,6-linked oligosaccharides composed of glucose. *Carlsberg Res. Commun.*, 41 (1976) 91-110; C.A., 86 (1977) 27377r - Bio-Gel P-4.
- 10b. *Polysaccharides, mucopolysaccharides and lipopolysaccharides*
- 4886 Alvarez Sanchez, P.: (Chromatographic behavior of polysaccharides in a MAK (methylated albumin-Kieselguhr) column. Application to the purification of DNA). *An. Inst. Invest. Vet., Madrid*, 23 (1975) 149-167; C.A., 85 (1976) 118984g.
- 4887 Carlsson, H.E. and Bernander, S.: Affinity chromatography of antigens from *Candida albicans*. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 613-616; C.A., 85 (1976) 121523m.
- 4888 Clementson, K.J., Pfueller, S.L., Luscher, E.F. and Jenkins, C.S.P.: Isolation of the membrane glycoproteins of human blood platelets by lectin affinity Chromatography. *Biochim. Biophys. Acta*, 464 (1977) 493-508 - affinity chromatography.
- 4889 Johnson, L.D. and Warfel, J.: Isolation and characterization of an epithelial basement membrane glycoprotein from murine kidney and further characterization of an epithelial basement membrane glycoprotein secreted by murine teratocarcinoma cells *in vitro*. *Biochim. Biophys. Acta*, 455 (1976) 538-549 - CPG-10-350 (controlled pore glass); phosphocellulose; Bio-Gel A-5m.
- 4890 Maitra, S.K. and Ballou, C.E.: Characterization of a manna-like oligosaccharide from *Mycobacterium smegmatis*. *Biochem. Biophys. Res. Commun.*, 73 (1976) 1101-1108 - Bio-Gel P-2.
- 4891 Stuhlsatz, H.W. and Greiling, H.: The preparation of dermatan sulfate. In: D.A. Hall (Editor), *Methodol. Connect. Tissue Res.*, Joynson-Bruvvers, Oxford 1976 pp. 137-146; C.A., 86 (1977) 27359m - a review with 21 refs.
- 4892 Svensson, H., Elhammar, A., Autuori, F. and Dallner, G.: Biogenesis of microsomal membrane glycoproteins in rat liver. IV. Characteristics of a cytoplasmic lipoprotein having properties of a membrane precursor. *Biochim. Biophys. Acta*, 455 (1976) 383-398 - Sephadex G-25, G-100, G-200.
- 4893 Thiem, J., Sievers, A. and Karl, H.: Präparative Zugänge zu Mannbiose und Laminaribiose. *J. Chromatogr.*, 130 (1977) 305-313 - Sephadex G-25.
- 4894 Van Dijk, J.A.P.P., Henkens, W.C.M. and Smit, J.A.M.: The determination of the molecular weight distribution of amylose by gel permeation chromatography. *J. Polym. Sci., Polym. Phys. Ed.*, 14 (1976) 1485-1493; C.A., 85 (1976) 145143p - Porasil.

See also 4838.

11. ORGANIC ACIDS AND LIPIDS

11a. *Organic acids and simple esters*

- 4895 Egashira, S.: (Behavior of saturated lower aliphatic polycarboxylic acids on the column of polystyrene type strong basic anion-exchange resin). *Bunseki Kagaku (Jap. Anal.)*, 25 (1976) 858-860 - Dowex 1-X8.
- 4896 Terada, H., Hayashi, T., Kawai, S. and Ohno, T.: High-performance liquid chromatographic determination of pyruvic acid and α -ketoglutaric acid in serum. *J. Chromatogr.*, 130 (1977) 281-286 - Zipax Permaphase AAX.

11b. Lipids and their constituents

- 4897 Koscielak, J., Miller-Podraza, H., Krauze, R. and Piassek, A.: Isolation and characterization of poly(glycosyl) ceramides (megaloglycolipids) with A,H and I blood-group activities. *Eur. J. Biochem.*, 71 (1976) 9-18 - Sephadex G-50.
- 4898 Kuksis, A.: Routine chromatography of simple lipids and their constituents. *J. Chromatogr.*, 143 (1977) 3-30 - a review with 195 refs.
- 4899 MacDonald, R.C. and Rempas, S.P.: Dry column chromatography of phospholipids. *J. Chromatogr.*, 131 (1977) 157-168 - silica gel.

11c. Lipoproteins

- 4900 Carter, T., Magnani, H.N. and Watts, R.: Analysis of serum lipids and lipoproteins by high speed liquid chromatography. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 33-40; *C.A.*, 85 (1976) 173640s - silica gel H, Sepharose Cl 4B, polyacrylamide-Sepharose.
- 4901 Peeters, H., Blaton, V. and Caster, H.: Hydrophobic separation of plasma proteins and lipoproteins. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 681-685; *C.A.*, 85 (1976) 118982e.
- 4902 Wille, L.E.: A simple and rapid method for isolation of serum lipoproteins from the other serum protein constituents. *Clin. Chim. Acta*, 71 (1976) 355-357; *C.A.*, 85 (1976) 173624q - CNBr-Sepharose.

See also 4844.

13. STEROIDS

- 4903 Butler, J., Fantl, V. and Lin, C.K.: Separation of corticosteroids for measurement by competitive protein binding. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 59-61; *C.A.*, 85 (1976) 173643v - μBondapak NH₂.
- 4904 Fantl, V., Lin, C.K. and Gray, C.H.: Separation of estrogens and determination of estriol in human pregnancy urine. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 51-57; *C.A.*, 85 (1976) 173642u.
- 4905 Maysinger, D., Marcus, C.S., Wolf, W., Tarle, M. and Casanova, J.: Preparation and high-performance liquid chromatography of iodinated diethylstilbestrols and some related steroids. *J. Chromatogr.*, 130 (1977) 129-138 - silica gel.
- 4906 Setchell, K.D.R., Alme, B., Axelson, M. and Sjovall, J.: The multi-component analysis of conjugates of neutral steroids in urine by lipophilic ion exchange chromatography and computerized gas chromatography-mass spectrometry. *J. Steroid. Biochem.*, 7 (1976) 615-629; *C.A.*, 85 (1976) 139331g - Sephadex LH-20.
- 4907 Van den Berg, J.H.M., Milley, J., Vonk, N. and Deelder, R.S.: Mechanisms of separation using the ternary mixture dichloromethane-ethanol-water in high-performance liquid chromatography. *J. Chromatogr.*, 132 (1977) 421-427.

16. NITRO AND NITROSO COMPOUNDS

- 4908 Smith, S.C. and Gage, L.D.: Liquid chromatography of dinitro-p-xylanes. *J. Chromatogr.*, 131 (1977) 425-429 - Partisil 10.
- 4909 Wolfram, J.H., Feinberg, J.I., Doerr, R.C. and Fiddler, W.: Determination of n-nitrosoproline at the nanogram level. *J. Chromatogr.*, 132 (1977) 37-43 - LiChrosorb Si-60.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

- 4910 Adler, H., Margoshes, M., Snyder, L.R. and Spitzer, C.: Rapid chromatographic method to determine polyamines in urine and whole blood. *J. Chromatogr.*, 143 (1977) 125-136 - Technicon C-2 resin.
- 4911 Hermansson, J. and Karlen, B.: Assay of the major (4-hydroxylated) metabolite of diphenyl hydantoin in human urine by reversed-phase high-performance liquid chromatography. *J. Chromatogr.*, 130 (1977) 422-425 - μBondapak C₁₈.
- 4912 Jorand, J.: Separation of catecholamines and their metabolites by high-speed liquid chromatography. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 125-130; *C.A.*, 85 (1976) 173650v.
- 4913 Keller, R., Oke, A., Mefford, I. and Adams, R.N.: Liquid chromatographic analysis of catechol amines. Routine assay for regional brain mapping. *Life Sci.*, 19 (1976) 995-1003; *C.A.*, 85 (1976) 173665d.
- 3914 Leppard, J.P., Harrison, A.D.R. and Reid, E.: Problems in separating urinary metaadrenalines. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 131-141; *C.A.*, 85 (1976) 173651w.
- 4915 Mee, T.J.X. and Smith, J.A.: High pressure chromatographic separation of some biogenic amines and derivatives implicated in the etiology of schizophrenia. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 119-124; *C.A.*, 85 (1976) 173649b - Corasil, Bondapak.

18. AMINO ACIDS

- 4916 Bober, H.: (Ion-exchange chromatography of amino acids. Part 4). *GIT Fachz. Lab.*, 20 (1976) 891-892, 895-896; *C.A.*, 86 (1977) 27335a - a review with 8 refs.
- 4917 Bulantova, H., Pokorny, J., Nguyen, T.L. and Janicek, G.: (Comparison of methods for the determination of L-lysine in products of animal origin). *Veterinarstvi*, 26 (1976) 467-468; *C.A.*, 86 (1977) 27366m - a review without refs.
- 4918 Doury-Berthold, M., Poitrenaud, C. and Tremillon, B.: Ligand-exchange separations of amino acids. I. Distribution equilibria of some amino acids between ammoniacal copper(II) nitrate solutions and phosphonic, carboxylic and iminodiacetic ion exchangers in the copper(II) form. *J. Chromatogr.*, 131 (1977) 73-90 - copper(II) phosphonate resin.
- 4919 Ersser, R.S.: Rapid ion-exchange chromatography of plasma amino acids. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975) Academic Press, New York, London, 1976, pp. 23-32; *C.A.*, 85 (1976) 173639y.
- 4920 Ersser, R.S.: A fast automated ion-exchange chromatographic method for the analysis of plasma amino acids. *Med. Lab. Sci.*, 33 (1976) 257-263; *C.A.*, 86 (1977) 27372k - Technicon TSM amino acid analyser.
- 4921 Grushka, E., Kikta, E.J., Jr. and Naylor, E.W.: Tryptophan and kynurenone determination in untreated urine reversed-phase high-pressure liquid chromatography. *J. Chromatogr.*, 143 (1977) 51-56 - Partisil ODS.
- 4922 Kalsz, H., Kovacs, G., Nagy, J., Knoll, J., Tyihak, E. and Patthy, A.: The analysis of N^G-methylated arginines from biological samples. In: B. Rosby (Editor), *Proc. Hung. Annu. Meet. Biochem.*, 15th, Magy. Rem. Egyesulete, Budapest 1975; *C.A.*, 85 (1976) 119013b.
- 4923 Kubota, E. and Nakagawa, M.: A quantitative determination of amino acids in tea by an automatic amino acid analyzer. *JEOL News*, 11A (1973) 16-21; *C.A.*, 85 (1976) 121917t - LC-R-1 resin.
- 4924 Lin, K.-T.D.: Use of a low-salt, alkaline buffer in the elution of basic amino acids from a single-column amino acid analyzer. *J. Chromatogr.*, 132 (1977) 160-164 - Durrum DC-1A resin.

- 4925 Lund, E., Thomsen, J. and Brunfeldt, K.: The use of *o*-phthalaldehyde for fluorescence detection in conventional amino acid analyzers. Sub-nanomole sensitivity in the analysis of phenylthiohydantoin-amino acids. *J. Chromatogr.*, 130 (1974) 51-54 - Beckman Model 120C AP analyser.
- 4926 Murayama, K. and Shindo, N.: Recommended method for the analysis of amino acids in biological materials. *J. Chromatogr.*, 143 (1977) 137-152 - Hitachi Custom 2618 resin.
- 4927 Nishizawa, N. and Kandatsu, M.: (Improved procedure for determination of amino acids and related compounds in biological fluids by ion-exchange chromatography; simultaneous analyses of acid, neutral and basic components by double-chromatogram). *Bunseki Kagaku (Jap. Anal.)*, 25 (1976) 829-834 - Aminex A-5.
- 4928 Pinheiro, P.A., Price, R.L. and Feitosa, F.F.: Single column ion exchange analysis of asparagine and glutamine in the presence of other amino acids. *Cienc. Agron.*, 3 (1973) 99-101; *C.A.*, 85 (1976) 173618r.
- 4929 Rokushika, S., Murakami, F. and Hatano, H.: Single-wavelength detection for amino acid analysis. *J. Chromatogr.*, 130 (1977) 324-326 - Hitachi Model KLA-3B Amino acid analyser.
- 4930 Shannon, C.F. and Dahlstrom, R.V.: Determination of thyroxine, I-U in serum. *Braz. Pedido PI* 74 06,191 (Cl.GO1N33/16), 23 Mar. 1976, Appl. 74/6, 191, 26 Jul. 1974, 13 pp; *C.A.*, 85 (1976) 119228a.

19. PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

19a. Peptides (including peptidic and proteinous hormones)

- 4931 Fox, L., Anthony, G.D. and Lau, E.P.K.: High-performance liquid chromatographic determination of L-aspartyl-L-phenylalanine methyl ester in various food products and formulations. *J. Ass. Off. Anal. Chem.*, 59 (1976) 1048-1050; *C.A.*, 86 (1977) 15283u.
- 4932 Bagenmaier, H.E., Schmitz, I. and Fühles, J.: Zum Vorkommen von Isopeptidbindungen in der Eihülle der Regenbogenforelle (*Salmo gairdneri* Rich.). *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1435-1438 - Aminex A-5.
- 4933 Krummen, K. and Frei, R.W.: The separation of nonapeptides by reversed-phase high-performance liquid chromatography. *J. Chromatogr.*, 132 (1977) 27-36 - Nucleosil C₈ and C₁₈.
- 4934 Krummen, K. and Frei, R.W.: Quantitative analysis of nonapeptides in pharmaceutical dosage forms by high-performance liquid chromatography. *J. Chromatogr.*, 132 (1977) 429-436 - Nucleosil C₈ and C₁₈.
- 4935 Millar, R.P., Aehnelt, C. and Rossier, G.: Higher molecular weight immunoreactive species of leuteinizing hormone releasing hormone: possible precursors of the hormone. *Biochem. Biophys. Res. Commun.*, 74 (1977) 720-731 - Sephadex G-25, Bio-Gel P-2.
- 4936 Radhakrishnan, A.N., Stein, S., Licht, A., Gruber, K.A. and Udenfriend, S.: High-efficiency cation-exchange chromatography on polypeptides and polyamines in the nanomole range. *J. Chromatogr.*, 132 (1977) 552-555 - Partisil SCX.
- 4937 Schnabel, E.: Synthese von Konjugaten des Heptalysins mit Penicillinen. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1365-1377 - CM-cellulose.
- 4938 Tojo, H. and Ogawa, K.: Purification of chicken growth hormone from pituitary residue after extraction of glycoprotein hormones. *Mem. Fac. Agric. Kagoshima Univ.*, 12 (1976) 129-132; *C.A.*, 86 (1977) 13500p - DEAE-cellulose.
- 4939 Weber, U. and Schmid, H.: Synthese und biologische Aktivität des Dekapeptides Gly-Pro-Cys-Ala-Arg-Phe-Gly-Gly-Cys als Modell für das aktive Zentrum des basischen Trypsininhibitors aus Rinderorganen (Kunitz-Inhibitor). *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1359-1363 - Bio-Gel P-2.
- 4940 Yoshida, H., Zimmerman, C.L. and Pisano, J.J.: High performance liquid chromatography and droplet countercurrent chromatography in the peptide laboratory. *Pept.: Chem., Struct. Biol., Proc. Amer. Pept. Symp.*, 4th, (1975) 955-965; *C.A.*, 85 (1976) 118942s.
- 4941 Zabin, B.A.: Determination of thyroid hormone. *Braz. Pedido PI* 74 05,386 (Cl.GO1N33/16), 03 Mar. 1976, Appl. 74/5,386, 28 Jun. 1974, 18 pp.; *C.A.*, 85 (1976) 173863s.

19b. Elucidation of structure of proteins

- 4942 Becker, U., Fietzek, P.P., Nowak, H. and Timpl, R.: Isolation and structure of the amino-terminal cross-linking region in insoluble type III collagen. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1409-1415 - Bio-Gel P-4, P-10.
- 4943 Chambert, R. and Gonzy-Treboul, G.: Levansucrase of *Bacillus subtilis*. Characterization of stabilized fructosylenzyme complex and identification of an aspartyl residue as the binding site of the fructosyl group. *Eur. J. Biochem.*, 71 (1976) 493-508 - Bio-Gel P-2, P-10, hydroxyapatite, SP-Sephadex C-25.
- 4944 Draper, R.K., Fiskum, G.M. and Edmond, J.: Purification molecular weight, amino acid and subunit composition of arylsulfatase A from human liver. *Arch. Biochem. Biophys.*, 177 (1976) 525-538 - DEAE-cellulose, Sephadex G-200.
- 4945 Dreker, L., Schwarz, J., Reichel, W. and Hilschmann, N.: Die Primärstruktur eines monoklonalen IgG₁-Immunoglobulins (Myelomprotein Nie), I Reinigung und Charakterisierung des Proteins der L- und H-Ketten, der Bromcyanpaltprodukte. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1515-1540 - Sephadex G-100, Dowex 50-X4, Sephadex G-50.
- 4946 Gething, M.-J.H. and Davison, B.E.: Chorismate mutase/prephenate dehydratase from *Escherichia coli* K 12. 2. Evidence for identical subunits catalysing the two activities. *Eur. J. Biochem.*, 71 (1976) 327-336 - Sephadex G-50.
- 4947 Gething, M.-J.H., Davidson, B.E. and Dopheide, T.A.A.: Chorismate mutase/prephenate dehydratase from *Escherichia coli* K 12. 1. The effect of NaCl and its use in a new purification involving affinity chromatography on Sepharosyl-phenylalanine. *Eur. J. Biochem.*, 71 (1976) 317-325 - hydroxyapatite, Sepharosyl-phenylalanine, Sepharose 4B.
- 4948 Hsu, R., Singer, S.J., Keim, P., Deuel, T.F. and Heinrikson, R.L.: Structural studies of *Bacillus subtilis* glutamine synthetase. Further purification, sulphydryl groups and the NH₂-terminal amino acid sequence. *Arch. Biochem. Biophys.*, 178 (1977) 644-651 - Bio-Gel A 1,5, hydroxyapatite.
- 4949 Jörnvall, H.: The primary structure of yeast alcohol dehydrogenase. *Eur. J. Biochem.*, 72 (1977) 425-442 - Sephadex G-50.
- 4950 Kemshead, J.T. and Hipkiss, A.R.: Degradation of abnormal proteins in *Escherichia coli*. Differential proteolysis *in vitro* of *E. coli* alkaline phosphatase cyanogen-bromide-cleavage products. *Eur. J. Biochem.*, 71 (1976) 185-192 - Sephadex G-100, G-50.
- 4951 Matsui, T., Onishi, T. and Muramatsu, M.: Nuclear DNA-dependent RNA polymerase from rat liver. 1. Purification and subunit structure. *Eur. J. Biochem.*, 71 (1976) 351-360 - DEAE-Sephadex A-25, phosphocellulose.
- 4952 Mevel-Ninio, M., Risler, Y. and Labeyrie, F.: Structural studies of yeast flavocytochrome b₂: cooperative roles of the α and β globules in the formation of the flavin-binding sites. *Eur. J. Biochem.*, 73 (1977) 131-140 - Bio-Gel A-5m.
- 4953 Moss, T., Cary, P.D., Abercrombie, B.D., Crane-Robinson, C. and Bradbury, E.M.: A pH-dependent interaction between histones H2A and H2B involving secondary and tertiary folding. *Eur. J. Biochem.*, 71 (1976) 337-350 - Sephadex G-100.
- 4954 Ponstingl, H. and Hilschmann, N.: Die Primärstruktur eines monoklonalen IgG₁-immunoglobulins (Myelomprotein Nie), II Isolierung und Aminosäuresequenz der tryptischen Peptide der H-Kette. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1541-1570 - Dowex 1-X2.
- 4955 Rasulov, A.S., Evstigneyeva, Z.G., Kretovich, W.L., Stelmaschuk, V.Ya., Samsonidze, T.G. and Kiselev, N.A.: (Purification, properties and quaternary structure of glutamine synthetase from *Chlorella*). *Biokhimiya*, 42 (1977) 350-358 - Sephadex G-200, Ultragel ACA-22, DEAE-cellulose.
- 4956 Rauterberg, J., Allmann, H., Henkel, W. and Fietzek, P.P.: Isolation and characterization of CNBr derived peptides of the α₁(III) chain of pepsin solubilized calf skin collagen. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1401-1407 - CM-cellulose, Bio-Gel P-100, P-4.
- 4957 Ribolow, H., Barany, K., Steinschneider, A. and Barany, M.: Lack of phosphate incorporation into TN-I in live frog muscle. *Arch. Biochem. Biophys.*, 179 (1977) 81-85 - troponin C-Sepharose 4B.
- 4958 Samorodova-Bianki, G.B., Streltsyna, S.A. and Zaprenetov, M.N.: (On heterogeneity of molecular forms of phenoloxidase from apple fruits). *Biokhimiya*, 42 (1977) 443-450 - Sephadex G-200.

- 4959 Schiltz, E. and Schnackerz, K.D.: Sequence studies on D-serine dehydratase of *Escherichia coli*. Primary structure of the tryptic phosphopyridoxyl peptide and of the N-terminus. *Eur. J. Biochem.*, 71 (1976) 109-116 - Sephadex G-25, Aminex A-5.
- 4960 Sjödahl, J.: Repetitive sequences in protein A from *Staphylococcus aureus*. Arrangement of five regions within the protein four being highly homologous and Fc-binding. *Eur. J. Biochem.*, 73 (1977) 343-351 - phosphocellulose, DEAE-cellulose.
- 4961 Sobieszek, A.: Ca-linked phosphorylation of a light chain of vertebrate smooth-muscle myosin. *Eur. J. Biochem.*, 73 (1977) 477-483 - Sepharose 4B.
- 4962 Steffens, G. and Busse, G.: Reinigung und Charakterisierung des Enzyms aus Rinderherzen und Identifizierung der im Komplex enthaltenen Peptidketten. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1125-1137 - Bio-Gel P-60.
- 4963 Takeahig, K., Hess, B., Böhm, M. and Zimmermann-Telschow, H.: Mitochondrial adenosinetriphosphatase from yeast, *Saccharomyces cerevisiae*. Purification, subunit structure and kinetics. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1605-1622 - Ultrogel AcA-34, DEAE-cellulose.
- 4964 Thompson, A.R., Enfield, D.L., Ericsson, L.H., Legaz, M.E. and Fenton, J.W., II.: Human thrombin: Partial primary structure. *Arch. Biochem. Biophys.*, 178 (1976) 356-367 - Sephadex G-100.
- 4965 Tschesche, H. and Kupfer, S.: Hydrolysis-resynthesis equilibrium of the lysine-15-alanine-16 peptide bond in bovine trypsin inhibitor (Kunitz). *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 769-776 - Sephadex G-50, CM-Sephadex C-25.
- 4966 Welinder, K.G.E. and Mazza, G.: Amino-acid sequences of heme-linked, histidine-containing peptides of five peroxidases from horseradish and turnip. *Eur. J. Biochem.*, 73 (1977) 353-358 - Sephadex G-50.

20. PROTEINS INCLUDING ENZYMES

- 4967 Breitenbach, M.: Hydrophobic chromatography of catalases and hemoglobins on a series of alkyl-substituted Sepharoses. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 687-690; *C.A.*, 85 (1976) 118242p.
- 4968 Carlsson, J.: Enzyme immobilization and covalent chromatography by means of thiol-disulfide exchange. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 537-540; *C.A.*, 85 (1976) 118485v.
- 4969 Hjerten, S.: Purification of proteins by hydrophobic interaction chromatography. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 667-673; *C.A.*, 85 (1976) 118980c.
- 4970 Pahlman, S., Rosengren, J. and Hjerten, S.: Hydrophobic interaction chromatography on uncharged Sepharose derivatives effects of neutral salts on the adsorption of proteins. *J. Chromatogr.*, 131 (1977) 99-108.

See also 4800, 4806, 4837, 4847, 4852.

20a. Proteins of plant origin incl. bacteria

- 4971 Belew, M.: The trypsin and chymotryps n inhibitors in chick peas (*Cicer arietinum L.*). The relationships amo , the six iso inhibiters. *Eur. J. Biochem.*, 73 (1977) 411-420 - DEAE-Sephadex G-25, Sephadex G-75.
- 4972 Graaf De, F.K. and Lkaasen-Boor, P.: Purification and characterization of a complex between cloacin and its immunity protein isolated from *Enterobacter cloacae* (Clo DF 13). Dissociation and reconstitution of the complex. *Eur. J. Biochem.*, 73 (1977) 107-114 - CM-Sephadex C-50, Sephadex G-200.
- 4973 Klimenko, V.G. and Tyurina, Zh.P.: (Study of total protein and albumin fractions of sunflower seeds by chromatography on different supports and by electrophoresis). *Izv. Akad. Nauk Mold. SSR, Ser. Biol. Khim. Nauk.*, (1976) 15-25; *C.A.*, 86 (1977) 27370h - Sephadex G-100, G-200, DEAE-cellulose.
- 4974 Pio King, T., Kochoumian, L. and Lichtenstein, L.M.: Preparation and immunochemical properties of methoxypolyethylene glycol-coupled and N-carboxymethylated derivatives of ragweed pollen allergen, antigen E. *Arch. Biochem. Biophys.*, 178 (1977) 442-450 - Sephadex G-100.

- 4975 Rüdiger, H.: Purification and properties of blood-group-specific lectins from *Vicia cracca*. *Eur. J. Biochem.*, 72 (1977) 317-322 - Sepharose-N-caproylgalactosamine.
- 20b. *Plasma proteins*
- 4976 Andron, L.A. and Ascher, M.S.: Chromatography of transfer factor and assay of fractions *in vitro*. *Transfer Factor, (Proc. Int. Workshop Basic Prop. Clin. Appl. Transfer Factor)*, 2nd, (1975, Publ. 1976) 291-300; *C.A.*, 85 (1976) 121514j - Sephadex G-25.
- 4977 Bing, D.H., Andrews, J.M., Soddath, F.L. and Spencer, R.: Affinity chromatography of the subunits of human C. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 551-557; *C.A.*, 85 (1976) 121520h.
- 4978 Burrowes, C.E. and Movat, H.Z.: Isolation of antithrombin III from human plasma: Its separation from α_1 -antitrypsin. *Biochem. Biophys. Res. Commun.*, 74 (1977) 140-149 - QAE-Sephadex A-50, Sephadex G-200, heparin-Sepharose 4B, Con A-Sepharose 4B.
- 4979 Goussault, Y., Sharif, A. and Bourrillon, R.: Serum albumin biosynthesis and secretion by resting and lectin stimulated human lymphocytes. *Biochem. Biophys. Res. Commun.*, 73 (1976) 1030-1036 - Sephadex G-200.
- 4980 Habal, F.M. and Movat, H.Z.: Rapid purification of human high molecular weight kininogen. *Agents Actions*, 6 (1976) 565-568; *C.A.*, 85 (1976) 118969f - QAE-Sephadex, CM-Sephadex.
- 4981 Higgins, D.A.: Fractionation of fowl immunoglobulins. *Res. Vet. Sci.*, 21 (1976) 94-99; *C.A.*, 85 (1976) 141159a - Sephadex G-200, DEAE-Sephadex A-50.
- 4982 Memon, M.S. and Baskova, I.P.: (Activation of bovine prothrombin citraconylation products by factor X α). *Biokhimiya*, 42 (1977) 505-512 - Sephadex G-100.
- 4983 Minta, J.O.: Purification of native properdin by reversed affinity chromatography and its activation by proteolytic enzymes. *J. Immunol.*, 117 (1976) 405-412; *C.A.*, 85 (1976) 121530m.
- 4984 Nelsestuen, G.L.: Role of γ -carboxyglutamic acid. An unusual protein transition required for the calcium-dependent binding of prothrombin to phospholipid. *J. Biol. Chem.*, 251 (1976) 5648-5656 - agarose.
- 4985 Orlova, A.S. and Baskova, I.P.: (Activation of plasma factor XIII by acetylated thrombin). *Biokhimiya*, 42 (1977) 297-299 - DEAE-cellulose.
- 4986 Pedersen, A.O., Schonheyder, F. and Brodersen, R.: Photooxidation of human serum albumin and its complex with bilirubin. *Eur. J. Biochem.*, 72 (1977) 213-221 - Sephadex G-150.
- 4987 Popova, L.G., Zubairov, D.M., Zinkevich, O.D. and Kochurina, G.Yu.: (Effect of immobilized noradrenaline on human blood plasma arginine esterase activated by factor XII). *Biokhimiya*, 42 (1977) 403-407 - noradrenalin-Sepharose 4B.
- 4988 Stemberger, A. and Hörmann, H.: Affinity chromatography on immobilized fibrinogen and fibrin monomer, II. The behavior of cold-insoluble globulin. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1003-1005 - fibrinogen-Sepharose.
- 4989 Suomela, H.: Human coagulation factor IX. Isolation and characterization. *Eur. J. Biochem.*, 71 (1976) 145-154 - DEAE-Sephadex A-50, hydroxyapatite, heparin-Sepharose.
- 4990 Van Kamp, G.J., Tamboer, W.P.M., Jansen, J.L.J., Koene, R.A.P. and Wijdeveld, P.G.A.B.: Automatic separation of mouse serum IgG1 and IgG2 using immobilized specific anti-H-chain antibodies. *Protides Biol. Fluids, Proc. Colloq.*, 23 (1975, Publ. 1976) 609-611; *C.A.*, 85 (1976) 121522k.
- See also 4849, 4855, 4859, 4901.
- 20c. *Structural and muscle proteins*
- 4991 Culbertson, V.B. and Freedberg, I.M.: Mammalian epidermal keratin. Isolation and characterization of the α -helical proteins from newborn rat. *Biochim. Biophys. Acta*, 490 (1977) 178-191 - Sephadex G-150, G-200.
- 4992 Greene, L.E. and Yount, R.G.: Observation on the kinetics, subunit composition, and sulfhydryl reactivity of myosin from *Physarum polycephalum*. *Biochim. Biophys. Acta*, 480 (1977) 326-332 - Sepharose 4B.

4993 Malik, M.N. and Stracher, A.: Allosteric behavior of platelet myosin. *Arch. Biochem. Biophys.*, 178 (1977) 451-458 - Sepharose 4B.

4994 Narayanan, A.S. and Page, R.C.: Biochemical characterization of collagens synthesized by fibroblasts derived from normal and diseased human gingiva. *J. Biol. Chem.*, 251 (1976) 5464-5471 - CM-cellulose.

20d. Protamines, histones and other nuclear proteins

4995 Parker, M.G., Sheehan, D.M. and O'Malley, B.W.: Effects of estrogen on gene expression in the chick oviduct. Isolation and fractionation of chromatin non-histone proteins. *Biochim. Biophys. Acta*, 454 (1976) 138-153 - Bio-Rex 70, Bio-Gel A-15n and 0.5m, DEAE-cellulose, phosphocellulose.

4996 Tanuma, S., Enomoto, T. and Yanada, M.: Distribution of poly(ADP-ribose) in histones of HeLa cell nuclei. *Biochim. Biophys. Res. Commun.*, 74 (1977) 599-605 - SP-Sephadex C-50.

20e. Chromoproteins and metalloproteins

4997 Altosaar, J., Bohm, B.A. and Taylor, J.E.P.: Isolation and properties of a ferredoxin from leaves of *Sambucus racemosa*. *Can. J. Biochem.*, 55 (1977) 159-164 - DEAE-cellulose, Sephadex G-75.

4998 Hochman, A. and Carneli, C.: Reconstitution of photosynthetic electron transport and photophosphorylation in cytochrome-c₂ deficient membrane preparation of *Rhodopseudomonas capsulata*. *Arch. Biochem. Biophys.*, 179 (1977) 349-359 - DEAE-cellulose.

4999 Johnson, M.H., Moon-Penn, W.F., Bechtel, K.C., Jue, D.L., Therrell, Jr., B.L. and Schmidt, R.M.: Hemoglobin A Austin and Wace: two hemoglobins with substitution in the α₁ β₂ contact region. *Arch. Biochem. Biophys.*, 179 (1977) 86-94 - DEAE-Sephadex, Aminex A-5.

5000 Sakura, J.D. and Rupley, J.A.: Guanidination of horse methemoglobin. *Arch. Biochem. Biophys.*, 179 (1977) 322-327 - Dowex 1-X2.

5001 Van Eijk, H.G. and Van Noort, W.L.: Isolation of rat transferrin using cyanogen bromide-activated Sepharose 4B. *J. Clin. Chem. Clin. Biochem.*, 14 (1976) 475-478; *C.A.*, 86 (1977) 27380m - CNBr-Sepharose 4B.

See also 4854.

20f. Varia, with special references to non-identified and tissue proteins

5002 Bösterling, B., Engel, J., Steinemann, A. and Schramm, H.J.: Extrinsic signals for monitoring the association reaction of proteins as introduced by fluorescent and non-fluorescent labels. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1283-1296 - Bio-Gel P-30.

5003 Calissano, P., Mercanti, D. and Levi, A.: Ca^{2+,K}-regulated intramolecular cross-linking of S-100 protein via disulfide bond formation. *Eur. J. Biochem.*, 71 (1976) 45-52 - Ultrogel, Sephadex G-25.

5004 Christensen, M.E., Beyer, A.L., Walker, B. and LeStourgeon, W.M.: Identification of N₁, N₂-dimethylarginine in a nuclear protein from the lower eukaryote *Physarum polycephalum* homologous to the major proteins of mammalian 40S ribonucleoprotein particles. *Biochim. Biophys. Res. Commun.*, 74 (1977) 621-629 - phosphocellulose.

5005 Cotter, R., Rothenberg, S.P. and Weiss, J.P.: Purification of the intestinal receptor for intrinsic factor by affinity chromatography. *Biochim. Biophys. Acta*, 490 (1977) 19-26 - affinity chromatography, Sepharose 6B.

5006 Crimaldi, A. and Ihler, G.: Isolation and properties of an inhibitor of *Escherichia coli* RNA polymerase. *Eur. J. Biochem.*, 71 (1976) 201-210 - Sephadex G-100.

5007 Dubin, A.: A polyvalent proteinase inhibitor from horse-blood-leucocyte cytosol. Isolation, purification and some molecular parameters. *Eur. J. Biochem.*, 73 (1977) 429-435 - DEAE-Sephadex A-50, Sephadex G-50.

5008 Hemminki, K.: Binding of tubulin to substituted Sepharose. *Acta Chem. Scand.*, Ser. B, B30 (1976) 794-796; *C.A.*, 86 (1977) 13360t.

- 5009 Kemper, W.M., Berry, K.W. and Merrick, W.C.: Purification and properties of rabbit reticulocyte protein synthesis initiation factors M2Ba and M2B β . *J. Biol. Chem.*, 251 (1976) 5551-5557 - Sephadex G-75, DEAE-cellulose, phosphocellulose.
- 5010 Mraz, W., Fischer, G. and Jatzkewitz, H.: The activator of cerebroside sulphatase. Lysosomal localization. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1181-1191 - Con A-Sepharose.
- 5011 Nordmeyer, J.-P., Dorn, G. and Mayer, H.: Gel isoelectric focusing of highly purified bovine parathyrin. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 893-896 - Bio-Gel P-10.
- 5012 Payne, D.W., Peng, L.-H., Pearlman, W.H. and Talbert, L.M.: Corticosteroid-binding proteins in human colostrum and milk and rat milk. *J. Biol. Chem.*, 251 (1976) 5272-5279 - Sephadex G-200, DEAE-Sephadex A-50.
- 5013 Pozniczek, M. and Sarnecka-Keller, M.: The middle-weight molecular peptide fraction obtained from rat liver plasma membrane-enriched preparation. *Bull. Acad. Pol. Sci., Ser. Sci. Biol.*, 24 (1976) 313-317; *C.A.*, 85 (1976) 139458d - Sephadex G-75.
- 5014 Smirnov, A.N., Smirnova, O.V. and Rozen, V.B.: (Revealing and preliminary characterization of a particular estrogen binding protein from liver of male rats). *Biokhimiya*, 42 (1977) 560-571 - Sephadex G-200.

See also 4835, 4853, 4854.

20g. Enzymes: oxidoreductases

- 5015 Bosron, W.F., Li, T.-K., Lange, L.G., Dafeldecker, W.P. and Vallee, B.L.: Isolation and characterization of an anodic form of human liver alcohol dehydrogenase. *Biochem. Biophys. Res. Commun.*, 74 (1977) 85-91 - DEAE-cellulose, 4-[3-(N-6-aminocaproyl)-aminopropyl]-pyrazole bound to Sepharose.
- 5016 Dugal, B.S.: Localization, purification and substrate specificity of monoamine oxidase. *Biochim. Biophys. Acta*, 480 (1977) 56-69 - DEAE-cellulose, hydroxyapatite, Bio-Gel A-1.5.
- 5017 Fitzpatrick, F.A.: High-performance liquid chromatographic analysis of prostaglandins formed during *in vitro* incubations with prostaglandin 15-dehydrogenase. *J. Pharm. Sci.*, 65 (1976) 1609-1613; *C.A.*, 86 (1977) 13123t.
- 5018 Glemziene, I. and Kaziliumiene, B.: (New method for the purification of lipoate dehydrogenase from porcine heart and yeast). *Aktual. Vopr. Obmena Veshchestv., Mater. Konf. Vopr. Obmena Veshchestv. Org. Chel. Zhivotn.*, (1975, Publ. 1976) 58; *C.A.*, 86 (1977) 27174x.
- 5019 Hemler, M., Lands, W.E.M. and Smith, W.L.: Purification of the cyclooxygenase that forms prostaglandins. Demonstration of two forms of iron in the holoenzyme. *J. Biol. Chem.*, 251 (1976) 5575-5579 - DEAE-cellulose, Bio-Gel P-30.
- 5020 Prohaska, J.R., Oh, S.-H., Hoekstra, W.G. and Ganther, H.E.: Glutathione peroxidase: Inhibition by cyanide and release of selenium. *Biochem. Biophys. Res. Commun.*, 74 (1977) 64-71 - Sephadex G-10.
- 5021 Sato, S., Harris, J.J.: Superoxide dismutase from *Thermus aquaticus*. Isolation and characterization of manganese and apo enzymes. *Eur. J. Biochem.*, 73 (1977) 373-381 - CM-cellulose, DEAE-cellulose, Sephadex G-100.
- 5022 Siegel, R.C. and Fu, J.C.C.: Collagen cross-linking. Purification and substrate specificity of lysyl oxidase. *J. Biol. Chem.*, 251 (1976) 5779-5785 - DEAE-cellulose.
- 5023 Sugawara, Y. and Sasaki, S.: Purification and properties of aldehyde dehydrogenase from *Proteus vulgaris*. *Biochim. Biophys. Acta*, 480 (1977) 343-350 - DEAE-cellulose, hydroxyapatite, Sephadex G-200.
- 5024 Veryovkina, I.V., Zukerman, D.B. and Gorkin, V.Z.: (Isolation of type B monoamine oxidases from liver mitochondria). *Biokhimiya*, 42 (1977) 426-435 - Sephadex G-200.
- 5025 Walk, R.-A. and Hock, B.: Separation of malate dehydrogenase isoenzymes by affinity chromatography on 5'-AMP-Sepharose. *Eur. J. Biochem.*, 71 (1976) 25-32 - 5'-AMP-Sepharose.

- 5026 Yasukochi, Y. and Masters, B.S.S.: Some properties of a detergent solubilized NADPH-cytochrome *c* (cytochrome P-450) reductase purified by biospecific affinity chromatography. *J. Biol. Chem.*, 251 (1976) 5337-5344 - DEAE-cellulose, Ultrogel AcA-34, 2',5'-ADP-Sepharose 4B.

See also 4841, 4843.

20h. Enzymes: transferases

- 5027 Bacharach, A.D.E., Markland, F.S., Pellino, A. and Weber, B.H.: Modification of yeast 3-phosphoglycerate kinase: Isolation and sequence determination of a nitrated active-site peptide and isolation of a carboxyl modified active site peptide. *Biochem. Biophys. Res. Commun.*, 74 (1977) 165-171 - Sephadex G-10, G-25.
- 5028 Barry, S., Broeilius, P. and Mosbach, K.: General ligand affinity chromatography: N^6 -(6-aminohexyl)3',5'-ADP-Sepharose as an affinity adsorbent for the CoA-dependent enzyme, succinate thiokinase. *FEBS Lett.*, 70 (1976) 261-266; *C.A.*, 87 (1977) 27149t - N^6 -(6-aminohexyl)3',5'-ADP-Sepharose.
- 5029 Bieri-Bonniel, F. and Dierks-Ventling, C.: Multiple forms of DNA-dependent RNA polymerase I from immature chick liver. Selective effect of 17 β -estradiol. *Eur. J. Biochem.*, 73 (1977) 507-513 - CM-Sephadex C-25, DEAE-Sephadex.
- 5030 Eronina, T.B., Silanova, G.V. and Livanova, N.B.: (Isolation and properties of glycogen phosphorylase *b* from rabbit liver). *Biokhimiya*, 42 (1977) 257-266 - ω -aminohexyl-Sepharose.
- 5031 Frank, J.J. and Levy, C.C.: Properties of a human liver ribonuclease. Inhibition by polynucleotides and specificity for phosphodiester bond cleavage to yield purine nucleosides at the 5' termini. *J. Biol. Chem.*, 251 (1976) 5745-5751 - Sephadex G-75, G-100, G-150, DEAE-cellulose poly(G) bound to Sepharose 4B.
- 5232 Grandgenett, D.P.: Purification of the α subunit of avian myeloblastosis virus DNA polymerase by polyuridylic acid-Sepharose. *J. Virol.*, 20 (1976) 348-350; *C.A.*, 85 (1976) 173321p.
- 5033 Hirai, M., Ohtani, E., Tanaka, A. and Fukui, S.: Glucose-phosphorylating enzymes of *Candida* yeasts and their regulation *in vivo*. *Biochim. Biophys. Acta*, 480 (1977) 357-366 - DEAE-cellulose, Sephadex G-100.
- 5034 Hirsch, J. and Martelo, O.J.: Phosphorylation of rat liver ribonucleic acid polymerase I by nuclear protein kinases. *J. Biol. Chem.*, 251 (1976) 5408-5413 - Sepharose 4B, DEAE-Sephadex.
- 5035 Kosaka, A., Spivey, H.O. and Gholson, R.K.: Yeast nicotinic acid phosphoribosyltransferase. Studies of reaction paths, phosphoenzyme and Mg^{2+} effects. *Arch. Biochem. Biophys.*, 179 (1977) 334-341 - Sephadex G-50.
- 5036 Kötting, E. and Lindinger, G.: Nachweis molekularer Varianten der γ -glutamyl-transferase mit differenter Concanavalin A-Affinität. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1439-1442 - Con A-Sepharose.
- 5037 Kowal, E.P. and Markus, G.: Affinity chromatography of thymidine kinase from a rat colon adenocarcinoma. *Prep. Biochem.*, 6 (1976) 369-385; *C.A.*, 85 (1976) 173319u.
- 5038 Maragoudakis, M.E. and Hankin, H.: Partial purification and properties of cyclic 3',5'-AMP-independent protein kinase from rat liver. *Biochim. Biophys. Acta*, 480 (1977) 122-136 - DEAE-cellulose, Bio-Gel A-0.5m, phosphocellulose.
- 5039 Matsui, T., Onishi, T. and Muramatsu, M.: Nucleolar DNA-dependent RNA polymerase from rat liver. 2. Two forms and their physiological significance. *Eur. J. Biochem.*, 71 (1976) 361-368 - phosphocellulose.
- 5040 Myllylä, R., Anttila, H., Risteli, L. and Kivirikko, K.I.: Isolation of collagen glucosyltransferase as a homogeneous protein from chick embryos. *Biochim. Biophys. Acta*, 480 (1977) 113-121 - affinity chromatography, Sephadex G-100.
- 5041 Radsak, K. and Weissbach, A.: Chloramphenicol-induced loss of mitochondrial DNA polymerase activity in HeLa cells. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1103-1107 - phosphocellulose.
- 5042 Sano, H. and Feix, G.: Terminal riboadenylate transferase from *Escherichia coli*. Characterization and application. *Eur. J. Biochem.*, 71 (1976) 577-583 - Sephadex G-75.

- 5043 Turner, J.F., Chensee, Q.J. and Harrison, D.D.: Glucokinase of pea seeds. *Biochim. Biophys. Acta*, 480 (1977) 367-375 - DEAE-cellulose, Sephadex G-200.

20i. Enzymes; hydrolases

- 5044 Artyukov, A.A. and Molodtsov, N.V.: Hydrophobic chromatography of N-acetyl- β -D-hexosaminidase. *J. Chromatogr.*, 130 (1977) 451-453 - aminoalkyl-Sephadex.
- 5045 Azhar, S. and Menon, K.M.J.: Cyclic nucleotide phosphodiesterase from rat anterior pituitary. Characterization of multiple forms and regulation by protein activator and Ca^{2+} . *Eur. J. Biochem.*, 73 (1977) 73-82 - agarose.
- 5046 Barns, R.J. and Elmslie, R.G.: Identification of a mucosal form of enteropeptidase in Triton X-100 extracts of porcine duodenal mucosa. *Biochim. Biophys. Acta*, 480 (1977) 450-460 - Ultrogel AcA-34, DEAE-cellulose, Sephadex G-200, Sephadex 4B.
- 5047 Beckett, G.J. and Boyd, G.S.: Purification and control of bovine adrenal cortical cholesterol ester hydrolase and evidence for the activation of the enzyme by a phosphorylation. *Eur. J. Biochem.*, 72 (1977) 223-233 - Sephadex G-200, Sephadex 4B.
- 5048 Cooke, R.D., Ferber, C.E.M. and Kanagasabapathy, L.: Purification and characterization of polygalacturonases from a commercial *Aspergillus niger* preparation. *Biochim. Biophys. Acta*, 452 (1976) 440-451 - DEAE-cellulose, Sephadex G-75, G-150.
- 5049 Davidson, L., Burkhardt, M., Ahn, S., Chang, L.-C. and Kitto, B.: L-Asparaginases from *Citrobacter freundii*. *Biochim. Biophys. Acta*, 480 (1977) 282-294 - DEAE-cellulose, Sephadex G-200, G-100.
- 5050 Farooqui, A.A. and Roy, A.B.: The sulphatase of ox liver. XX. The preparation of sulphatases B1a and B1b. *Biochim. Biophys. Acta*, 452 (1976) 431-439 - affinity chromatography, Sephadex G-100, CM-Sephadex.
- 5051 Fernandez-Lopez, V., Serrero, G., Negrel, R. and Ailhaud, G.: Esterolytic activities of rat intestinal mucosa. 2. Purification and properties of a glycerol-ester hydrolase. *Eur. J. Biochem.*, 71 (1976) 259-270 - carboxyhexanoyl-Sephadex-glyceryldioctanoate.
- 5052 Fernandez-Sousa, J.M., Gavilanes, J.G., Munico, A.M., Perez-Aranda, A. and Rodriguez, R.: Lysozyme from the insect *Ceratitis capitata* eggs. *Eur. J. Biochem.*, 72 (1977) 25-33 - Sephadex G-25, G-75, G-200.
- 5053 Gubensek, F., Barstow, L., Kregar, I. and Turk, V.: Rapid isolation of cathepsin D by affinity chromatography on the immobilised synthetic inhibitor. *FEBS Lett.*, 71 (1976) 42-44; *C.A.*, 86 (1977) 13090e.
- 5054 Hasunuma, K. and Ishikawa, T.: Control of the production and partial characterization of repressible extracellular 5'-nucleotidase and alkaline phosphatase in *Neurospora crassa*. *Biochim. Biophys. Acta*, 480 (1977) 178-193 - DEAE-cellulose, Sephadex G-100.
- 5055 Ishikawa, I. and Cimasoni, G.: Isolation of cathepsin D from human leucocytes. *Biochim. Biophys. Acta*, 480 (1977) 228-240 - DEAE-Sephadex A-50, Sephadex G-200.
- 5056 Jeanneret, L., Roth, M. and Bargetzi, J.-P.: Carboxypeptidase N from pig serum. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 867-872 - Sephadex G-150, G-200.
- 5057 Johansen, J.T., Breddam, K. and Ottesen, M.: Isolation of carboxypeptidase Y by affinity chromatography. *Carlsberg Res. Commun.*, 41 (1976) 1-14; *C.A.*, 86 (1977) 27186c.
- 5058 Johnson, D.A.: Purification and properties of rabbit trypsin. *Biochim. Biophys. Acta*, 452 (1976) 482-487 - affinity chromatography.
- 5059 Kamimura, Y., Uryu, S. and Funakoshi, T.: Urokinase. *Japan. Pat.* 76 20,596 (C1.C07G7/02), 25 Jun. 1976, Appl. 73/50,004,02 May 1973, 3pp.; *C.A.*, 85 (1976) 173511a.
- 5060 Kasche, V., Amneus, H., Gabel, D. and Näslund, L.: Rapid zymogen activation and isolation of serine proteases from an individual mouse pancreas by affinity chromatography. Genetical heterogeneity of chymotrypsins of *Mus musculus*. *Biochim. Biophys. Acta*, 490 (1977) 1-18 - affinity chromatography, Sephadex G-75.
- 5061 Kosugi, Y.: (Adsorption of lipase onto hydrophobic surfaces. Application to affinity chromatography). *Kagaku To Seibutsu*, 14 (1976) 580-581; *C.A.*, 86 (1977) 13342p.

- 5062 Kovaleva, G.G., Yusupova, M.P., Balandina, G.N., Lysogorskaya, E.N. and Stepanov, V.M.: (Isolation of pure aspergillopepsin A). *Biokhimiya*, 42 (1977) 534-539 - ECTEOLA-cellulose, C-Sepharose 4B, Acrylex P-10.
- 5063 Kuzuya, Y., Wagner, F.W., Kilara, A. and Shahani, K.M.: Affinity chromatographic isolation of milk acid phosphatase. *Milchwissenschaft*, 31 (1976) 358-362; *C.A.*, 85 (1976) 121978p.
- 5064 Lampkin, S.L., IV., Cole, K.W., Vitto, A. and Gaertner, F.H.: The protease problem in *Neurospora*. Variable stability of enzymes in aromatic amino acid metabolism. *Arch. Biochem. Biophys.*, 177 (1976) 561-565 - Bio-Gel A.
- 5065 Levine, N., Hatcher, V.B. and Lazarus, G.S.: Proteinases of human epidermis; a possible mechanisms for polymorphonuclear leukocyte chemotaxis. *Biochim. Biophys. Acta*, 452 (1976) 458-467 - Sephadex G-75, Bio-Gel P-2.
- 5066 Lo, T.N., Cohen, A.B. and James, H.L.: The interaction of α -1-antitrypsin with soluble and Sepharose-bound elastase. *Biochim. Biophys. Acta*, 453 (1976) 344-346 - affinity chromatography.
- 5067 Martin, H.H., Schilf, W. and Maskos, C.: Purification of the membrane-bound DD-carboxy-peptidase of the unstable spheroplast L-form of *Proteus mirabilis* by affinity chromatography. Non-competitive inhibition of the enzyme by penicillins and low stability of the enzyme-inhibitor complex. *Eur. J. Biochem.*, 71 (1976) 585-593 - succinylamidodecyl-cellulose-linked ampicillin.
- 5068 Nijjar, M.S. and Hawthorne, J.N.: Purification and properties of polyphosphoinositide phosphomonoesterase from rat brain. *Biochim. Biophys. Acta*, 480 (1977) 390-402 - DEAE-cellulose, calcium phosphate-cellulose, Sephadex G-100.
- 5069 Nishijima, M., Nakaike, S., Tamori, Y. and Nojima, S.: Detergent resistant phospholipase A of *Escherichia coli* K-12. Purification and properties. *Eur. J. Biochem.*, 73 (1977) 115-124 - Sephadex G-100, DEAE-cellulose.
- 5070 Ohlsson, K. and Olsson, A.-S.: Purification and partial characterization of human pancreatic elastase. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1153-1161 - Sephadex G-25, SP-Sephadex C-50, trasyloL-Sepharose 4B.
- 5071 Roberts, R.M., Bazer, F.W., Baldwin, N. and Pollard, W.E.: Progesterone induction of lysozyme and peptidase activities in the porcine uterus. *Arch. Biochem. Biophys.*, 177 (1976) 499-507 - Sephadex G-200.
- 5072 Scherer, R., Huber-Friedberg, W., Salem, A. and Ruhenstroth-Bauer, G.: Phospholipase A₂ activity in human γ -globulin fraction. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 897-902 - DEAE-Sephadex A-50, Con A-Sepharose.
- 5073 Schleuning, W.-D., Hell, R. and Fritz, H.: Multiple forms of human acrosin: isolation and properties. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 855-865 - Sephadex G-75, p-aminobenzamidine-Sepharose.
- 5074 Tobias, P.F. and Schumacher, G.F.B.: Observation of two proacrosins in extracts of human spermatozoa. *Biochem. Biophys. Res. Commun.*, 74 (1977) 434-439 - Sephadex G-100.
- 5075 Tripathi, R.K. and O'Brien, R.D.: Purification of acetylcholinesterase from housefly brain by affinity chromatography. *Biochim. Biophys. Acta*, 480 (1977) 382-389 - affinity chromatography, Sephadex G-50.
- 5076 Van der Weyden, M.B. and Kelley, W.N.: Human adenosine deaminase. Distribution and properties. *J. Biol. Chem.*, 251 (1976) 5448-5456 - agarose, Sepharose 4B, Sephadex G-100.
- 5077 Wallat, S. and Kunau, W.H.: *In vitro* activation of a soluble cholesterol esterase from bovine adrenals by a cAMP-dependent protein kinase. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 949-960 - Sephadex G-25, G-200, Sepharose 4B.
- 5078 Wilkinson, T.J., Mariano, P.S. and Glover, G.I.: Affinity chromatographic separations of chemically modified α -chymotrypsins from α -chymotripsyin. *Separ. Sci.*, 11 (1976) 385-389.
- 5079 Willcox, P. and Renwick, A.G.C.: Effect of neuraminidase on the chromatographic behaviour of eleven acid hydrolases from human liver and plasma. *Eur. J. Biochem.*, 73 (1977) 579-590 - DEAE-cellulose.
- 5080 Yackzan, K.S., Abdul-Gawad, H. and Zeineh, R.A.: In-line dialysis with column chromatography-application to rabbit serum isoamylases. *Amer. Lab.*, 8 (1976) 17-18; *C.A.*, 85 (1976) 118566x.
- 5081 Yoshimoto, T., Oka, I. and Tsuru, D.: Creatine amidinohydrolase of *Pseudomonas putida*: crystallization and some properties. *Arch. Biochem. Biophys.*, 177 (1976) 508-515 - sarcosine-HM-Sepharose (HM = hexymethylendiamine).

20k. Enzymes: lyases

- 5082 Buckner, J.S., Kolattukudy, P.E. and Poulose, A.J.: Purification and properties of malonyl-coenzyme A decarboxylase, a regulatory enzyme from the uropygial gland of goose. *Arch. Biochem. Biophys.*, 177 (1976) 538-551 - Sepharose 4B, QAE-Sephadex A-25.
- 5083 El-Dorry, H.A. and Bacila, M.: Purification and properties of rabbit heart muscle aldolase. *Biochim. Biophys. Acta*, 480 (1977) 305-314 - phosphocellulose, Sephadex G-75.
- 5084 Jargiello, P., Sushak, C. and Hoffee, P.: 2-deoxyribose-5-phosphate aldolase: isolation and characterization of proteins genetically modified in the active site region. *Arch. Biochem. Biophys.*, 177 (1976) 630-641 - DEAE-cellulose.

20l. Enzymes: isomerases

- 5085 Lee, Y.H., Wankat, P.C. and Emery, A.H.: Purification of glucose isomerase by affinity chromatography. *Biotechnol. Bioeng.*, 18 (1976) 1639-1642; *C.A.*, 86 (1977) 13096m.

20m. Enzymes: ligases

- 5086 Knopf, K.-W.: Simple isolation method and assay for T4 DNA ligase and characterization of the purified enzyme. *Eur. J. Biochem.*, 73 (1977) 33-38 - phosphocellulose, DEAE-Sephadex A-50.

20n. Enzymes: complex mixtures

- 5087 Bonomi, F., Pagani, S., Cerletti, P. and Cannella, C.: Rhodanese mediated sulfur transfer to succinate dehydrogenase. *Eur. J. Biochem.*, 72 (1977) 17-24 - Sephadex G-75.
- 5088 McCarville, M. and Marshall, V.: Partial purification and characterization of a bacterial enzyme catalyzing reductive cleavage of anthacycline glycosides. *Biochim. Biophys. Res. Commun.*, 74 (1977) 331-335 - DEAE-cellulose, Ultrogel AcA-44.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

- 5089 Breter, H.J. and Zahn, R.K.: (An isocratic high-pressure liquid chromatographic purification method for radioactively labeled deoxyribonucleoside triphosphates). *Z. Naturforsch. C*, 31 (1976) 551-553; *C.A.*, 85 (1976) 173626s - LiChrosorb NH₂.
- 5090 Cocucci, M.C., Dalla Rosa, S. and Cocucci, M.: An improved method for determination of nucleotide levels in yeast, *Rhodotorula gracilis*. *Ann. Microbiol. Enzimol.*, 25 (1975) 29-42; *C.A.*, 85 (1976) 173623p - Celite-Novite.
- 5091 Eckstein, H., Schott, H. and Bauer, E.: Investigation on peptide-nucleotide interactions using template chromatography. The specific recognition of peptide sequences by oligodeoxyadenylic acids. *Biochim. Biophys. Acta*, 432 (1976) 1-9 - template chromatography, (polyvinyl-(pA)_n) -DEAE-cellulose polyvinyl(pT)_n -DEAE-cellulose and DEAE-cellulose alone.
- 5092 Esckstein, H., Schott, H. and Bayer, E.: Synthesis of tryptophanpeptide gels on a polyacrylic matrix for the investigation of peptide nucleotide interaction. *Makromol. Chem.*, 177 (1976) 645-652; *C.A.*, 84 (1970) 165450u.
- 5093 Khym, J.X., Bynum, J.W. and Volkin, E.: Co-use of retention time and bandwidth measurements in quantitative evaluation of the nucleotide pool derived from mammalian cells. *Report*, 1976 CONF-761002-1, 36 pp.; *C.A.*, 86 (1977) 27388v.
- 5094 Mosbach, K., Larsson, P.O. and Lindberg, M.: N¹-(carboxymethyl)- or N⁶-16--aminohexylaminocarbonylmethyl)adenine nicotinamide dinucleotide and its use as ligand in affinity chromatography and as an active coenzyme. *Swed. Pat.* 386(Cl.CO7H19/20), 02 Aug. 1976, Appl. 73/14,958, 05 Nov. 1973, 11 pp.; *C.A.*, 86 (1977) 16910h.

- 5095 Perrett, D.: High performance liquid chromatography of nucleotides in biological fluids. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 109-117; C.A., 85 (1976) 173648a - AS-Pellionex SAX.
- 5096 Silberklang, M., Prochiantz, A., Haenni, A.-L. and Rajbhandary, U.L.: Studies on the sequence of the 3'-terminal region of turnip-yellow-mosaic virus RNA. *Eur. J. Biochem.*, 72 (1977) 465-478.
- 5097 Zappelli, P., Pappa, R., Rossodivita, A. and Re, L.: Preparation and coenzymic activity of soluble polyethyleneimine-bound NADP⁺ derivatives. *Eur. J. Biochem.*, 72 (1977) 309-315 - DEAE-cellulose.

21b. Nucleic acids: RNA

- 5098 Abrescia, P. and Colantuoni, V.: (Purification of histidine-specific tRNA from *Salmonella typhimurium*). *Rass. Med. Sper.*, 22 (1975) 37-44; C.A., 85 (1976) 173616p - DEAE-Sephadex A-50, cellulose.
- 5099 Ensinger, M.J. and Moss, B.: Modification of the 5' terminus of mRNA by an RNA (guanine-7-)methyltransferase from HeLa cells. *J. Biol. Chem.*, 251 (1976) 5283-5291 - DEAE-cellulose, DNA-agarose, CM-Sephadex.
- 5100 Galibert, F. and Hampe, A.: 5,9-s RNA a new RNA characterized in several mammalian cell lines. *Eur. J. Biochem.*, 73 (1977) 359-365 - methylated albumin.

See also 4840, 4848.

21c. Nucleic acids: DNA

See 4886.

21f. Structural studies on nucleic acids

- 5101 Crawford, R.J., Scott, A.C. and Wells, J.R.E.: Organization of sequences in avian globin mRNA. *Eur. J. Biochem.*, 72 (1977) 291-299 - Sephadex G-75, G-50.
- 5102 Gedanu, L. and Dixon, G.H.: Translation of protamine mRNA in a rabbit reticulocyte cell-free system. *Can. J. Biochem.*, 55 (1977) 152-158 - CM-cellulose.
- 5103 Groner, Y., Grosfield, H. and Littauer, U.Z.: 5'-capping structure of *Artemia salina* mRNA and the translational inhibition by cap analogs. *Eur. J. Biochem.*, 71 (1976) 281-293 - DEAE-cellulose.
- 5104 Van Boom, J.H. and De Rooy, J.F.M.: Sequence analysis of synthetic oligonucleotides by high-performance liquid anion-exchange chromatography. *J. Chromatogr.*, 131 (1977) 169-177 - Permaphase AAX.
- 5105 Venkatesan, S., Nakazato, H. and Edmonds, M.: Preparation and properties of a poly A resin and its use in the isolation of naturally occurring poly U sequences. *Nucleic Acids Res.*, 3 (1976) 1925-1936; C.A., 85 (1976) 119012a.
- 5106 Yukioka, M., Hatayama, T. and Omori, K.: Nucleotide sequence of a region in 23-S RNA adjacent to peptidyl transferase catalytic center of *Escherichia coli* ribosomes. *Eur. J. Biochem.*, 73 (1977) 449-459 - DEAE-Sephadex A-25, CM-cellulose.

See also 5096.

22. ALKALOIDS

- 5107 Forni, G. and Massarani, G.: High-performance liquid chromatographic determination of colchicine and colchicoside in colchicum (*Colchicum autumnale* L.) seeds on a home-made stationary phase. *J. Chromatogr.*, 131 (1977) 444-447 - LiChrosorb SI-60.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

- 5108 Battersby, A.R., Buckley, D.G., Hodgson, G.L., Markwell, R.E. and McDonald, E.: Separation of porphyrin isomers by HPLC-biochemical and biosynthetic applications. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 63-70; *C.A.*, 85 (1976) 173644w - μ Porasil.

24. ORGANIC SULPHUR COMPOUNDS

- 5109 Miyata, T., Ito, A., Hirashima, T. and Manabe, O.: (Studies of autoxidation. III. Oxidation of 4-nitro-2-toluenesulfonate with molecular oxygen in alkaline solution. Analysis of reaction products by means of high-speed liquid chromatography). *Nippon Kagaku Kaishi*, (1976) 650-653; *C.A.*, 86 (1977) 16029c.

See also 4874.

25. ORGANIC PHOSPHORUS COMPOUNDS

- 5110 Jensen, H., Habault, F., Lacoste, A.M., Cassaigne, A. and Neuzil, E.: Analyse chromatographique d'analogues phosphoniques de dipeptides. *J. Chromatogr.*, 132 (1977) 556-561 - Technicon C_3 chromobeads.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

- 5111 Alper, H. and Prickett, J.E.: Metal carbonyl induced reactions of azirines. Coupling and insertion by diiron enneacarbonyl. *Inorg. Chem.*, 16 (1977) 67-71 - alumina.
5112 Restivo, R.J., Ferguson, G., Ng, T.W. and Carty, A.J.: Synthesis and crystal structure analysis of bis(Δ -cyclopentadienyl)- μ -[trifluoromethyl(oxodiphenyl-phosphino)acetylene]-dinickel (O). *Inorg. Chem.*, 16 (1977) 172-176 - alumina.

27. VITAMINS AND VARIOUS GROWTH FACTORS

- 5113 Bigler, W.N. and Kelly, D.M.: Liquid chromatographic analysis of ascorbate and ascorbate-2-sulfate. *Ann. N. Y. Acad. Sci.*, 258 (1975) 70-71; *C.A.*, 85 (1976) 119010y.
5114 Castillo, L., Tanaka, Y., DeLuca, H.F. and Sunde, M.L.: The stimulation of 25-hydroxyvitamin D_3 - 1α -hydroxylase by estrogen. *Arch. Biochem. Biophys.*, 179 (1977) 211-217 - Sephadex LH-20.
5115 DeLuca, H.F.: Recent advances in our understanding of the metabolism of vitamin D and its regulation. *Clin. Endocrinol. (Oxford)*, 5, Suppl. (Mol. Endocrinol., Proc. Endocrinol., 1975) (1976) 97-108; *C.A.*, 85 (1976) 118064g.
5116 Nguyen-Thien Luan, Pokorny, J., Coupek, J. and Pokorny, S.: Fractionation of the oxidation products of α -tocopherol and their condensation products with L-lysine by combined thin-layer and gel chromatography. *J. Chromatogr.*, 130 (1977) 378-383 - S-gel 832.
5117 Zabrodskaya, S.V.: (Ion exchange methods for isolating tetrathiamine phosphates). *Vestsi Akad. Nauk B SSR, Ser. Biyal. Navuk*, 4 (1976) 67-69. (Belorussian); *C.A.*, 85 (1976) - Dowex 50W.

28. ANTIBIOTICS

- 5118 Bundgaard, H. and Larsen, C.: Polymerization of penicillins. IV. Separation, isolation and characterization of ampicillin polymers formed in aqueous solution. *J. Chromatogr.*, 132 (1977) 51-59 - DEAE-Sephadex A-25.
- 5119 Miller, R.D. and Neuss, N.: High-performance liquid chromatography of natural products. I. Separation of cephalosporin C derivatives and cephalosporin antibiotics; Isolation of cephalosporin C from fermentation broth. *J. Antibiot.*, 29 (1976) 902-906; *C.A.*, 85 (1976) 198077b - propylamine silica.

29. INSECTICIDES AND OTHER PESTICIDES

- 5120 Fukuhara, K., Takeda, M. and Uchiyama, M.: (Analysis of pesticide residues in foods. XX. An analytical method for chlorobenzilate, chloropropionate, phenisobromolate, and tetradifon in groups). *Shokuhin Eiseigaku Zasshi*, 17 (1976) 302-307; *C.A.*, 86 (1977) 15300x - Florisil.
- 5121 Huckins, J.N., Stalling, D.L. and Johnson, J.L.: Silicic acid chlorinated biphenyls and pesticides: some contaminants and limitations. *J. Ass. Offic. Anal. Chem.*, 59 (1976) 975-981; *C.A.*, 85 (1976) 172559k - silicic acid.
- 5122 Moye, H.A. and Wade, T.E.: A fluorometric enzyme inhibition detector for carbamate pesticide analysis by high speed liquid chromatography. *Anal. Lett.*, 9 (1976) 891-920; *C.A.*, 86 (1977) 12568e - Permaphase ODS.
- 5123 Rulkens, P.F.M.: (Automatic determination of pesticides in food). *Polytech. Tijdschr., Proceestech.*, 30 (1975) 877-879; *C.A.*, 85 (1976) 175671b.
- 5124 Seres, G.: Determination of zearalenone in *Fusarium*-infected corn samples. In: B. Rosby (Editor), *Proc. Hung. Annu. Meet. Biochem.*, 16th, Magy. Kem. Egyesulete, Budapest 1976, pp. 51-52; *C.A.*, 86 (1977) 13487q - silica gel.
- 5125 Wu, T., Lin, J.S. and Olcott, H.S.: Modified procedure for purification of ethoxyquin and ethoxyquin nitroxide. *J. Agr. Food Chem.*, 24 (1976) 1255; *C.A.*, 85 (1976) 172554e - Bio-Sil A.

30. SYNTHETIC AND NATURAL DYES

- 5126 Grombein, S. and Rüdiger, W.: On the molecular weight of phytochrome: a new high molecular phytochrome species in cat seedlings. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1015-1018 - Sephadex G-200.
- 5127 Loehr, W., Grobhofer, N., Sohmer, I. and Wittekind, D.: Thiazine dyes. *Ger. Offen. Pat.* 2,516,920 (Cl. C09B21/00), 21 Oct. 1976, Appl. 17 Apr. 1975, 8 pp.; *C.A.*, 86 (1977) 13516y - silica gel.
- 5128 Stepanenou, L.S. and Maksimov, O.B.: (Sephadex DMSO (dimethyl sulfoxide) gel-chromatographic study of humic acids). *Pochvovedenie*, (1976) 62-69; *C.A.*, 86 (1977) 15629m - Sephadex DMSO gel.
- 5129 Stoll, M.S., Lim, C.K. and Gray, C.H.: The separation of bile pigments by HPLC. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 97-108; *C.A.*, 85 (1976) 173647z - μ Porasil.

31. PLASTICS AND THEIR INTERMEDIATES

- 5130 Ambler, M.R.: Gel-permeation chromatography of low molecular weight polymers. *J. Polym. Sci., Polym. Lett. Ed.*, 14 (1976) 683-688; *C.A.*, 85 (1976) 193242s.
- 5131 Christopher, P.C.: Gel permeation chromatography method for GPC system definition and performance evaluation. *J. Appl. Polym. Sci.*, 20 (1976) 2989-3003; *C.A.*, 86 (1977) 17206v.
- 5132 Dublin, P.L.: Polymer separation. *Ind. Res.*, 18 (1976) 55-57; *C.A.*, 85 (1976) 193708y - Styragel, porous glass, silanized glass.

- 5133 Leonard, J. and Malhotra, S.L.: Polymerization of α -methylstyrene at high temperatures in tetrahydrofuran with potassium as initiator. I. Thermodynamic study and gel-permeation chromatographic analyses of the polymers. *J. Macromol. Sci. Chem.*, A, 10 (1976) 1273-1309; *C.A.*, 85 (1976) 160665d.
- 5134 Revillon, A., Dumont, B. and Guyot, A.: Molecular weight determination of vinylidene chloride copolymers by gel-permeation chromatography and viscometry. *J. Polym. Sci., Polym. Chem. Ed.*, 14 (1976) 2263-2273; *C.A.*, 85 (1976) 160981d.
- 5135 Sage, D., Berticat, P., Collet, G. and Rocca, J.L.: (High-pressure liquid chromatographic study of polyolefins and modified polyethylenes). *Angew. Makromol. Chem.*, 54 (1976) 167-186; *C.A.*, 85 (1976) 143703x.
- 5136 Tsvetkovskii, I.B., Valuev, V.I., Evdokimov, V.F. and Slyakhter, B.I.: (Correction of gel chromatograms of oligomers). *Kauch. Rezina*, 7 (1976) 57-60; *C.A.*, 85 (1976) 144357z.
- 5137 Vakhtina, I.A., Bettger, T., Andreev, A.P., Novozhilova, O.S. and Tarakanov, O.G.: (Use of gel-permeation chromatography for studying the molecular mass distributions of thermoplastic polyurethanes). *Vysokomol. Soedin., Ser. A.*, 18 (1976) 2138-2140; *C.A.*, 85 (1976) 178328f.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. Synthetic drugs and systematic analysis

- 5138 Barth, H.G. and Conner, A.Z.: Determination of doxorubicin hydrochloride in pharmaceutical preparations using high-pressure liquid chromatography. *J. Chromatogr.*, 131 (1977) 375-381 - Zorbax.
- 5139 Brown, M. and Bye, A.: The determination of allopurinol and oxipurinol in human plasma and urine. *J. Chromatogr.*, 143 (1977) 195-202 - Aminex A-27.
- 5141 Dixon, P.F. and Stoll, M.S.: The HPLC detection of some drugs taken in overdose. In: P.F. Dixon, C.H. Gray, C.K. Lin and M.S. Stoll (Editors), *High Pressure Liquid Chromatography in Clinical Chemistry* (Proc. Symp. 1975), Academic Press, New York, London, 1976, pp. 165-174; *C.A.*, 85 (1976) 172338n.
- 5142 Frischkorn, C.G.B. and Frischkorn, H.E.: (Rapid determination of quinine in beverages and other aqueous solutions). *Z. Lebensm.-Unters.-Forsch.*, 162 (1976) 273-277; *C.A.*, 86 (1977) 28534b - silica gel.
- 5143 Harzer, K. and Barchet, R.: Analyse von Benzodiazepinen und deren Hydrolysenprodukte, den Benzophenonen durch Hochdruckflüssigkeits-Chromatographie im umgekehrter Phase und ihre Anwendung auf biologisches Material. *J. Chromatogr.*, 132 (1977) 83-90 - LiChrosorb Si-100.
- 5144 Harzer, K. and Barchet, R.: (Separation and detection of some common analgesics by high-pressure liquid chromatography). *Dtsch. Apoth.-Ztg.*, 116 (1976) 1229-1231; *C.A.*, 85 (1976) 182461m.
- 5145 Kabra, P.M., Gotelli, G., Stanfill, R. and Marton, L.J.: Simultaneous measurement of phenobarbital, diphenylhydantoin, and primidone in blood by high-pressure liquid chromatography. *Clin. Chem.*, 22 (1976) 824-827; *C.A.*, 85 (1976) 116443f.
- 5146 Meffin, P.J., Harapat, S.R. and Harrison, D.C.: High-pressure liquid chromatographic analysis of drugs in biological fluids. III. Analysis of disopyramide and its mono-N-dealkylated metabolite in plasma and urine. *J. Chromatogr.*, 132 (1977) 503-510 - reversed-phase chromatography.
- 5147 Ross, M.S.F.: Chromatographic analysis of azapropazone and related benzotriazines. *J. Chromatogr.*, 131 (1977) 448-452 - Corasil II.
- 5148 Sondack, D.L. and Koch, W.L.: Analysis of urinary tract antibacterial agents in pharmaceutical dosage form by high-performance liquid chromatography. *J. Chromatogr.*, 132 (1977) 352-355 - Zipax SAX.
- 5149 Tjaden, V.R., Kraak, J.C. and Huber, J.F.K.: Rapid trace analysis of barbiturates in blood and saliva by high-pressure liquid chromatography. *J. Chromatogr.*, 143 (1977) 183-194 - LiChrosorb Si-60.
- 5150 Watson, I.D. and Stewart, H.J.: Quantitative determination of amitriptyline and nortriptyline in plasma by high-performance liquid chromatography. *J. Chromatogr.*, 132 (1977) 155-159 - Micropak.
- 5151 Wheals, B.B.: Forensic applications of liquid chromatography. *Proc. Anal. Div. Chem. Soc.*, 13 (1976) 164-168; *C.A.*, 85 (1976) 138076r.

32b. Metabolism of drugs, toxicological applications

- 5152 Kabra, P.M. and Marton, L.J.: High-pressure liquid-chromatographic determination of 5-(4-hydroxyphenyl)-5-phenylhydantoin in human urine. *Clin. Chem.*, 22 (1976) 1672-1674; *C.A.*, 86 (1977) 11659y.
 5153 Sharma, J.P., Perkins, E.G. and Bevill, R.F.: High-pressure liquid chromatographic separation, identification, and determination of sulfa drugs and their metabolites in urine. *J. Pharm. Sci.*, 65 (1976) 1606-1608; *C.A.*, 86 (1977) 25775v - amino-bonded reversed phase.

32d. Biomedical applications

- 5154 Anderson, C.: Ion chromatography: a new technique for clinical chemistry. *Clin. Chem.*, (Winston-Salem, N.C.), 22 (1976) 1424-1426; *C.A.*, 85 (1976) 139356u.
 5155 Hue, D., Corvol, P., Menard, J. and Sicard, P.J.: Affinity chromatography in the purification of diagnostic enzymes. *Process Biochem.*, 11 (1976) 20-24; *C.A.*, 86 (1977) 13037t.

33. INORGANIC SUBSTANCES

- 5156 Ellis, J.D., Thompson, G.A.K. and Sykes, A.G.: The Cr^{2+} reduction of titanium(IV). Comparisons with Cr^{2+} reduction of VO_2^+ and evidence for a TiO_2^{2+} structure in aqueous solutions, $\text{pH} \leq 1$. *Inorg. Chem.*, 15 (1976) 3172-3174.
 5157 Given, K.W., Mattson, B.M. and Pignolet, L.H.: Synthesis, properties and X-ray structural characterization of a novel seven-coordinate halogenotris-(dithiocarbamato)complex of ruthenium(IV). *Inorg. Chem.*, 15 (1976) 3152-3156.
 5158 Inoue, T., Endicott, J.F. and Ferraudi, G.J.: Photoredox energetics of transition metal complexes. A critical probing of the proposed redox and nitrene pathways in azidopentaamminerrhodium(III). *Inorg. Chem.*, 15 (1976) 3098-3104.
 5159 Ito, T. and Shibata, M.: Synthesis and optical resolution of *cis,cis*-dicyanodicarboxylatodiammine and *cis,cis*-dinitrodicarboxylatodiammine complexes of cobalt(III). *Inorg. Chem.*, 16 (1977) 108-115 - Dowex 1-X8.
 5160 Kharitonov, O.V., Radovich, V.S., Chuveleva, E.A., Nazarov, P.P. and Chmutov, K.V.: Effect of citric acid on the separation of rare earth elements by diethylenetriaminepentaacetic and nitrilotriacetic acids using the method of displacement chromatography. *Zh. Fiz. Khim.*, 50 (1976) 1870-1871; *C.A.*, 85 (1976) 182774r.
 5161 Kidani, Y., Naga, S. and Koike, H.: High-performance liquid chromatography of cobalt(III) mixed ligand complexes with acetylacetone and oxinate and monometoxyloxinate ions. *Chem. Lett.*, 9 (1976) 951-954; *C.A.*, 85 (1976) 13295e.
 5162 Lucansky, D.: Separation of condensed phosphates by ion-exchange chromatography and their analytical determination in liquid ammonium polyphosphate-based fertilizer). *Chem. Prum.*, 26 (1976) 514-517; *C.A.*, 86 (1977) 15632g - Dowex 2-X8.
 5163 Nakamura, T., Yano, T., Fujita, A. and Ohashi, S.: Anion-exchange chromatographic separation of linear phosphates with eluent containing a chelating agent. *J. Chromatogr.*, 130 (1977) 384-386 - Bio-Rad AG 1-X8.
 5164 Schmuckler, G. and Limoni, B.: Interaction of platinum chloride with a polyacrylamide gel and its monomeric analogues. *J. Inorg. Nucl. Chem.*, 39 (1977) 137-141.
 5165 Voldet, P. and Haerdi, W.: Determination of europium and dysprosium in rocks by neutron activation and high resolution X-ray spectrometry. *Anal. Chim. Acta*, 87 (1976) 227-231.
 5166 Yamamoto, M. and Yamamoto, Y.: Solvent effects in gel chromatography: The relationship between distribution coefficients of metal acetylacetones and solubility parameters of solvents. *Anal. Chim. Acta*, 87 (1976) 375-386.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 5167 Bhattacharyya, D.K. and Basu¹⁴⁴S.: Use¹⁴⁹ of alumina as an ion exchanger in the separation of carrier-free ¹⁴⁴Pr from ¹⁴⁴Ce. *Separ. Sci.*, 11 (1976) 503-508.
5168 Chmutov, K.V., Nazarov, P.P., Chuleva, E.A. and Kharitonov, O.V.: (Studies on the separation of transplutonium elements by displacement complex-formation chromatography). *Radiokhimiya*, 18 (1976) 628-634; *C.A.*, 85 (1976) 149475w.
5169 Dybczynski, R.: Investigations on the effect of flow rate loading and other factors upon the effectiveness of radiochemical separations by ion exchange chromatography. *J. Radioanal. Chem.*, 31 (1976) 115-137; *C.A.*, 85 (1976) 149436j.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35a. Synthetic drugs and systematic analysis

- 5170 Nakae, A., Furuya, K., Mikata, T. and Yamanaka, M.: (Analysis of ingredients in detergents by high-speed liquid chromatography. I. Determination of lower alkylbenzenesulfonates in detergents by high-speed liquid chromatography). *Nippon Kagaku Kaishi*, 9 (1976) 1426-1429; *C.A.*, 85 (1976) 179400k.
5171 Waters, J. and Kupfer, W.: The determination of cationic surfactants in the presence of anionic surfactants in biodegradation test liquors. *Anal. Chim. Acta*, 85 (1976) 241-251 - Bio-Rad AG 1-X2 (Cl⁻).

36. CELLS AND CELLULAR PARTICLES

- 5172 Ayad, S.R. and Delinassios, J.G.: Fractionation of Sendai virus RNA by polylysine-Kieselguhr column chromatography. *J. Chromatogr.*, 130 (1977) 396-398 - polylysine-Kieselguhr.
5173 Beutler, E., West, C. and Blume, K.G.: The removal of leukocytes and platelets from whole blood. *J. Lab. Clin. Med.*, 88 (1976) 328-333; *C.A.*, 85 (1976) 118968e.
5174 Bresler, S.E., Katushkina, N.V., Kolikov, V.M., Potokin, J.L. and Vinogradskaya, G.N.: Chromatography of viruses. *J. Chromatogr.*, 130 (1977) 275-280 - controlled pore glass.
5175 Darling, T., Albert, J., Russell, P., Albert, D.M. and Reid, T.W.: Rapid purification of an RNA tumor virus and proteins by high-performance steric exclusion chromatography on porous glass bead columns. *J. Chromatogr.*, 131 (1977) 383-390 - controlled pore glass.

See also 4846, 4856.

Paper Chromatography

1. REVIEWS AND BOOKS

- 5176 Aly, O.M. and Faust, S.D.: Paper chromatographic analysis in water pollution. In: R.L. Grob (Editor): *Chromatographic Analysis of the Environment*, Marcel Dekker, New York, 1975, pp. 489-513; *C.A.*, 85 (1976) 148731q.

2. FUNDAMENTALS, THEORY AND GENERAL

- 5177 Kuchar, M., Rejholec, V., Rabek, V., Brunova, B. and Nemecek, O.: (Relation between R_f values from paper chromatography and partition coefficients of dissociable compounds). *Experientia, Suppl.*, 23 (1976) 49-51; *C.A.*, 85 (1976) 137177n.
- 5178 Soczewiński, E., Matysik, G. and Dumkiewicz, W.: Investigations of the relationship between molecular structure and chromatographic parameters. X. Extraction of organic solutes with mixtures of chloroform and electron-donor solvents. *J. Chromatogr.*, 132 (1977) 379-386.
- 5179 Stahl, G.A.: Interview with Archer J.P. Martin. *J. Chem. Educ.*, 54 (1977) 80-83.

3. TECHNIQUES I (MATERIAL, SOLVENTS, DEVELOPMENT, DETECTION, QUANTITATIVE ANALYSIS)

- 5180 Karolczak, M., Dreiling, R., Adams, R.N., Felice, L.J. and Kissinger, P.T.: Electrochemical techniques for study of phenolic natural products and drugs in microliter volumes. *Anal. Lett.*, 9 (1976) 783-793; *C.A.*, 85 (1976) 149167x - PC and TLC.
- 5181 Von Arx, E. and Faupel, M.: Chromatographie auf Celluloseacetat-Folien. II. Leitfarbstoffe für die Chromatographie auf Celluloseacetat-Folien. *J. Chromatogr.*, 134 (1977) 529-531.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

- 5182 Matusiewicz, G.: (Determination of the degree of deterioration of oils using paper chromatography). *Tech. Smarzownicza*, No. 6 (1975) 184-186; *C.A.*, 85 (1976) 179907f.

6. ALCOHOLS

- 5183 Grigorev, G.L., Popov, O.S. and Zakharova, V.S.: (Analysis of a mixture of polyhydric alcohols using ascending paper chromatography). *V sb., Khim. Tekhnol. i Khim. Mashinostr.*, (1974) 26-30; *C.A.*, 85 (1976) 103493x.

10. CARBOHYDRATES

10a. Mono- and oligosaccharides; structural studies

- 5184 Chester, M.A., Yates, A.D. and Watkins, W.M.: Phenyl- β -D-galactopyranoside as an acceptor substrate for the blood group H gene-associated quanosine diphosphate L-fucose: β -D-galactosyl- α -2-L-fucosyltransferase. *Eur. J. Biochem.*, 69 (1976) 583-592.
- 5185 Codutti, P.L. and Bush, C.A.: Structure determination of N-acetyl amino sugar derivatives and disaccharides by gas chromatography and mass spectroscopy. *Anal. Biochem.*, 78 (1977) 21-38 - PC and TLC.
- 5186 Schindler, M., Assaf, Y., Sharon, N. and Chipman, D.M.: Mechanism of lysozyme catalysis: role of ground-state strain in subsite D in hen egg-white and human lysozymes. *Biochemistry*, 16 (1977) 423-431 - PC and TLC.
- 5187 Varshney, S.C., Rizvi, S.A.I. and Gupta, P.C.: Structure of a polysaccharide from the seeds of Cassia tora. Part II. Partial acidic hydrolysis. *J. Chem. Soc., Perkin Trans. I.*, (1976) 1621-1628.
- 5188 Vitek, V. and Vitek, K.: Chromatography of sugars in body fluids. III. Stepwise detection of sugars with aniline citrate on paper and thin-layer chromatograms. *J. Chromatogr.*, 143 (1977) 65-76 - PC and TLC.

See also 5279, 5280.

11. ORGANIC ACIDS AND LIPIDS**11b. Lipids and their constituents**

- 5189 Dawson, R.M.: Analysis of phosphatides and glycolipids by chromatography of their partial hydrolysis or alcoholysis products. In: G.V. Marinetti (Editor), *Lipid Chromatographic Analysis*, Marcel Dekker, New York, 2nd ed., 1976, pp. 149-172; *C.A.*, 85 (1976) 89526b.
5190 Wuthier, R.E.: Chromatography of phospholipids and glycolipids on Whatman SG-81 silica gel-loaded paper. In: G.V. Marinetti (Editor): *Lipid Chromatographic Analysis*, Marcel Dekker, New York, 2nd ed., 1976, pp. 59-109 - a review with 84 references.

See also 5302, 5315.

13. STEROIDS

- 5191 Kelsey, M.I. and Sexton, S.A.: Isolation and purification of lithocholic acid metabolites produced by the intestinal microflora. *J. Chromatogr.*, 133 (1977) 327-334.
5192 Kelsey, M.I. and Sexton, S.A.: The biosynthesis of ethyl esters of lithocholic acid and isolithocholic acid by rat intestinal microflora. *J. Steroid Biochem.*, 7 (1976) 641-647.
5193 Schönenhöfer, M. and Harendt, H.: Simultaneous radioimmunoassay for corticosterone and deoxycortisol in human serum: Sex differences in the mean serum concentrations. *J. Clin. Chem. Clin. Biochem.*, 15 (1977) 69-75.
5194 Smith, P. and Hall, C.J.: Two-dimensional chromatography of urinary tetrazolium-reacting steroids. *Ann. Clin. Biochem.*, 13, Pt. 4 (1976) 454-455; *C.A.*, 85 (1976) 89512u.
5195 Ulick, S. and Ramirez, L.C.: Adrenocortical factors in hypertension. II. The significance of 16-oxygenated C-19 steroids. *J. Steroid Biochem.*, 7 (1976) 953-961 - PC and TLC.

16. NITRO AND NITROSO COMPOUNDS

See 5335.

18. AMINO ACIDS

- 5196 Dubovsky, J., Geary, W.T. and Chilcutt, D.A.: Estimation of hydroxylysine in urine and serum of patients with chronic uremia. *Clin. Chim. Acta*, 76 (1977) 41-53 - TLC and PC.
5197 Khaimov, I.N. and Fuzailova, R.M.: (Determination of the amino acids of some corn varieties by partition paper chromatography). *Tr. Tadzh. Sel'skokhoz. Inst.*, 20 (1975) 156-159; *C.A.*, 85 (1976) 158031a.
5198 Baurain, R., Larochelle, J.F. and Lamy, F.: Photolysis of desmosine and isodesmosine by UV light. *Eur. J. Biochem.*, 67 (1976) 155-164.

19. PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS**19a. Peptides (including peptidic and proteinous hormones)**

- 5199 Shaw, L.M., London, J.W., Fetterolf, D. and Garfinkel, D.: γ -Glutamyltransferase: kinetic properties and assay conditions when γ -glutamyl-4-nitroanilide and its 3-carboxy derivative are used as donor substrates. *Clin. Chem.*, 23 (1977) 79-85.

5200 Tivol, W.F. and Benisek, W.F.: Preparative fractionation of peptide mixtures by two-dimensional chromatography and electrophoresis on paper. Location of peptides by contact printing. *Anal. Biochem.*, 78 (1977) 93-105.

19b. Elucidation of structure of proteins

5201 Ponstingl, H. and Hilschmann, N.: Zur Strukturregel der Antikörper. Die Primärstruktur eines monoklonalen IgG 1-Immunglobulins (Myelomprotein Nie), II. Isolierung und Aminosäuresequenz der tryptischen Peptide der H-Kette. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1541-1570.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

- 5202 Bergmann, F., Chen, G.W. and Rahat, M.: Physical properties and chemical reactivity of 8-(methylthio)hypoxanthines. *J. Chem. Soc., Perkin Trans. I*, (1976) 90-97.
- 5203 Cabrera-Juárez, E. and Setlow, J.K.: Formation of a thymine photoproduct in transforming DNA by near ultraviolet irradiation. *Biochim. Biophys. Acta*, 475 (1977) 315-322.
- 5204 Nagano, H., Kiuchi, H., Abe, Y. and Shukuya, R.: Purification and properties of an alkaline ribonuclease from the hepatic fraction of bullfrog *Rana catesbeiana*. *J. Biochem. (Tokyo)*, 80 (1976) 19-26.
- 5205 Tomanoi, F., Uchida, T., Egami, F. and Oshima, T.: Synthesis of various phosphodiesters and phosphomonooesters with ribonuclease N₁. *J. Biochem. (Tokyo)*, 80 (1976) 27-32 - PC and TLC.
- 5206 Uesugi, S. and Ikebara, M.: Synthesis and template-directed polymerization of adenylyl (3'-5')adenosine cyclic 2',3'-phosphate. *Biochemistry*, 16 (1977) 493-498.
- 5207 Vaccaro Torracca, A.M., Raschetti, R., Salvioli, R., Ricciardi, G. and Winterhalter, K.H.: Modulation of the root effect in goldfish by ATP and GTP. *Biochim. Biophys. Acta*, 496 (1977) 367-373.

See also 5365.

22. ALKALOIDS

5208 Shostenko, Yu.V., Danel'yants, V.A. and Chernysh, L.Ya.: Sensitivity of some reagents to opium alkaloids on thin-layer and paper chromatograms. *Farmatsiya (Moscow)*, 25, No. 3 (1976) 74-75; *C.A.*, 85 (1976) 112776u - PC and TLC.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

5209 Grinstein, M.: Simplified method for the determination of porphyrins in body fluids. *Anal. Biochem.*, 77 (1977) 577-580.

24. ORGANIC SULPHUR COMPOUNDS

5210 Nader, H.B. and Dietrich, C.P.: Determination of sulfate after chromatography and toluidine blue complex formation. *Anal. Biochem.*, 78 (1977) 112-118 - PC and TLC.

25. ORGANOMETALLIC AND RELATED COMPOUNDS

- 5211 Bogushevskii, A.N. and Gabov, N.I.: (Paper chromatography of some trichloro-methyl phenyl and pentafluorophenyl derivatives of phosphorus). *Zh. Anal. Khim.*, 31 (1976) 582-585; *C.A.*, 85 (1976) 103486x.
5212 Jensen, H., Habault, F., Lacoste, A.M., Cassaigne, A. and Neuzil, E.: Analyse chromatographique d'analogues phosphoniques de dipeptides. *J. Chromatogr.*, 132 (1977) 556-561 - PC and TLC of 14 compounds.

27. VITAMINS AND VARIOUS GROWTH FACTORS

- 5213 Brown, R. and Nickla, H.: Simultaneous separation of pteridines and ommochrome precursors by paper chromatography. *J. Chromatogr.*, 133 (1977) 423-424.
5214 Zabrodskaya, S.V.: (Ion-exchange methods for isolating tetrahydrothiamine phosphates). *Vestsi Akad. Navuk B. SSR, Ser. Biyal. Navuk*, No. 4 (1976) 67-69; *C.A.*, 85 (1976) 166690e.

28. ANTIBIOTICS

- 5215 Byrne, K.M., Kershner, A.S., Maehr, H., Marquez, J.A. and Schaffner, C.P.: Separation of gentamicin C-complex into five components by Craig distribution. *J. Chromatogr.*, 131 (1977) 191-203 - PC and TLC.
5216 Maghan, V., Kalincak, M., Barna, K. and Pavel, J.: (Preparation and control of $[^{99m}\text{Tc-Sn}]$ -tetracycline antibiotics). *Radioisotopy*, 17 (1976) 251-263; *C.A.*, 85 (1976) 198145x.

See also 5397.

29. INSECTICIDES AND OTHER PESTICIDES

See 5417, 5419.

30. SYNTHETIC AND NATURAL DYES

- 5217 Ishiguro, Y., Goto, K., Shibata, S., Nakashima, R., Sasaki, S., Furukawa, M. and Kamata, E.: (Paper chromatography of azo derivatives of chromotropic acid as organic reagents). *Nagoya Kogyo Gijutsu Shikensho Hokoku*, 24 (1975) 337-341; *C.A.*, 85 (1976) 103491v.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. *Synthetic drugs*

- 5218 Vulkova, A. and Panazova, P.: (Analytical studies of spasmokalm. IV. Separation and determination of spasmokalm in the presence of buscolysin and analgin). *Farmatsiya (Sofia)*, 26, No. 2 (1976) 1-8; *C.A.*, 85 (1976) 149196f.

32b. *Metabolism of drugs, toxicological applications*

- 5219 Koch, H. and Bodmann, R.: Akute Toxizität von Endomid^R und seinen Metaboliten. Korrelation zwischen biologischer Aktivität und lipophile Eigenschaften. *Arch. Pharm. (Weinheim)*, 309 (1976) 812-822.

- 5220 Koch, H.: Phytopharmakologische Untersuchung von Endomid^R und seinen Metaboliten. Korrelation zwischen Phytotoxizität, Zootoxizität und lipophilen Eigenschaften. *Arch. Pharm. (Weinheim)*, 309 (1976) 822-828.

32d. Biomedical applications

See 5188, 5193.

33. INORGANIC SUBSTANCES

- 5221 Capitan, F., Salinas, R. and Martinez, J.L.: (Chromatographic separation on paper impregnated with 5,5'-methylenebisalicylic acid). *Ars Pharm.*, 16 (1975) 561-567; *C.A.*, 85 (1976) 201526e.
- 5222 Dutta, R.L. and Ray, R.K.: Chromatographic studies on metal complexes. Part IV. Palladium (II) complexes of 1-amidino-O-alkyl-ureas. *J. Indian Chem. Soc.*, 53 (1976) 507-510; *C.A.*, 85 (1976) 153256t.
- 5223 Gaibakyan, D.S., Egikyan, R.T. and Mkhitaryan, L.F.: (Separation of selenium(IV), tellurium(IV) and gold(II) ions by paper chromatographic and electrochromatographic methods). *Arm. Khim. Zh.*, 28 (1975) 783-790; *C.A.*, 85 (1976) 116032w.
- 5224 Mathew, J., Rajeev, Tandon, S.N.: Rapid separation of alkali metal ions on zirconium antimone paper. *Chromatographia*, 10 (1977) 45.
- 5225 Qureshi, M., Varshey, K.G., Gupta, M.P. and Gupta, S.P.: Cation chromatography on stannic tungstate papers: Quantitative separation of vanadium from iron, titanium, zirconium and thorium. *Chromatographia*, 10 (1977) 29-36.
- 5226 Viktorova, M.E. and Isaeva, K.G.: (Use of paper chromatography for determination of nickel, cobalt and copper in iron ores). *Zavod. Lab.*, 42 (1976) 528-529; *C.A.*, 85 (1976) 201579z.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 5227 Colombetti, L.G., Moerlien, S., Patel, G.C. and Pinsky, S.M.: Rapid determination of oxidation state of unbound technetium-99m and labeling yield in technetium-99m labeled radiopharmaceuticals. *J. Nucl. Med.*, 17 (1976) 805-809; *C.A.*, 85 (1976) 166623k.
- 5228 Platt, S.G. and Bassham, J.A.: Separation of ¹⁴C-labeled glycolate pathway metabolites from higher plant photosynthate. *J. Chromatogr.*, 133 (1977) 396-401.
- 5229 Roll, D.E. and Conrad, H.E.: Quantitative radiochromatographic analysis of the major groups of carbohydrates in cultured animal cells. *Anal. Biochem.*, 77 (1977) 397-412.
- 5230 Tykva, R. and Franek, F.: Nondestructive and quantitative evaluation of radioactive spots on two-dimensional peptide maps by an automated procedure. *Anal. Biochem.*, 78 (1977) 572-576.

Thin-Layer Chromatography

1. REVIEWS AND BOOKS

- 5231 Anonymous: (*2nd Symposium on Chromatography*). Dum Techniky CVTS, Prague 1976, 283 pp. - Proceedings from the symposium organized by Kavalier in 1975. 28 papers, mostly on TLC.
- 5232 Bendler, D.F. and Elbert, W.C.: Thin-layer chromatographic analysis in air pollution. In: R.L. Grob (Editor): *Chromatographic Analysis of the Environment*, Marcel Dekker, New York, 1975, pp. 193-243; *C.A.*, 85 (1976) 181600u.
- 5233 Issaq, H.J. and Barr, E.W.: Recent developments in thin-layer chromatography. *Anal. Chem.*, 49 (1977) 83A-96A - a review with 36 references.

5234 Zlatkis, A. and Kaiser, R.E. (Editors): *HPTLC - High Performance Thin-Layer Chromatography*. Elsevier, Amsterdam, 1977, 240 pp.

2. FUNDAMENTALS, THEORY AND GENERAL

- 5235 Glöckner, G.: Volumenprofile und Konzentrationsprofile auf Dünnschichtplatten in Hinblick auf die Fraktionierung von Polymeren. *Faserforsch. Textiltechn.*, 27 (1976) 481-484.
- 5236 Marichy-Viricel, M. and Lamotte, A.: Significance des valeurs de R_F en chromatographie sur couches minces. *Chromatographia*, 10 (1977) 79-85.
- 5237 Palamareva, M.D., Kurtev, B.J.: Chromatographic behaviour of diastereomers. II. Thin-layer chromatographic behaviour of diastereomeric 1,2-disubstituted 1,2-diarylethylenes. *J. Chromatogr.*, 132 (1977) 61-72 - $R_F(\text{erythro}) > R_F(\text{threo})$, which was found valid for 37 diastereoisomer pairs, was confirmed for another 13 pairs; 2 pairs were an exception.
- 5238 Palamareva, M.D., Kurtev, B.J. and Haimova, M.A.: Chromatographic behaviour of diastereomers. III. Thin-layer chromatographic behaviour of diastereomeric 4-substituted 6,7-dialkoxy-3-aryl-tetrahydroisoquinolines and -isochromans. *J. Chromatogr.*, 132 (1977) 73-82 - 23 diastereoisomer pairs; $R_F(\text{trans}) > R_F(\text{cis})$ is attributed to two-point adsorption, the opposite to one-point adsorption.
- 5239 Soczewiński, E., Dzido, T. and Golkiewicz, W.: Comparison of high-performance liquid chromatographic and thin-layer chromatographic data obtained with various types of silica. *J. Chromatogr.*, 131 (1977) 408-411 - linear relationships between R_M and $\log k'$.
- 5240 Thijssen, H.H.W.: Salt effects in reversed-phase thin-layer chromatography on silica gels. *J. Chromatogr.*, 133 (1977) 355-358.
- 5241 Verzilina, M.K., Kotlyarova, O.S., Ovchinnikova, N.K. and Nifant'ev, E.E.: (Experience of using thin-layer chromatography in chemistry classes in schools). *Khim. Shk.*, No. 5 (1976) 83-87; *C.A.*, 85 (1976) 191504e.

3. TECHNIQUES I (MATERIAL, SOLVENTS, DEVELOPMENT, DETECTION, QUANTITATIVE ANALYSIS)

- 5242 Bonzani da Silva, J. and Rocha, A.B.: (New plastics from the preservation of chromatograms). *Rev. Fac. Farm. Odontol. Araraquara*, 8 (1974) 117-121; *C.A.*, 85 (1976) 103487y.
- 5243 Curtis, T.G. and Seitz, W.R.: Chemiluminescence: a new method for detecting fluorescent compounds separated by thin-layer chromatography. *J. Chromatogr.*, 134 (1977) 343-350 - spraying with bis-2,4,6-trichlorophenyl oxalate + H_2O in dioxane.
- 5244 Curtis, T.G. and Seitz, W.R.: Coupling of chemiluminescence thin-layer chromatographic detection to a Vidicon rapid scanning detector. *J. Chromatogr.*, 134 (1977) 513-516 - chemiluminescence intensity decrease with time requires rapid scanning.
- 5245 De Vries, G. and Brinkman, U.A.Th.: The use of plastic foil in small-scale thin-layer chromatography. *J. Chromatogr.*, 134 (1977) 235-237 - polyethylene or polyfluoroethylene sheets, mainly to form or seal the chamber or the solvent supply.
- 5246 Ebel, S., Herold, G., Scheck, M. and Schultze, K.: Quantitative Dünnschicht-chromatographie. Auswertung von *in situ*-Fluoreszenzmessungen durch Zweipunkteichung. *Arch. Pharm. (Weinheim)*, 308 (1975) 940-946.
- 5247 Ebel, S. and Hocke, J.: Vollautomatische rechnergesteuerte Auswertung von Dünnschichtchromatogrammen. *Chromatographia*, 10 (1977) 123-128.
- 5248 Engler, R.: (Experiments using thin-layer chromatography for study of volatile components and thermomicroevaporation for sample application). *Prax Naturwiss. Chem.*, 25 (1976) 225-229; *C.A.*, 85 (1976) 176259k.
- 5249 Gafurov, R.G., Shaimardanov, R.A., Kattaev, N.Sh., Narzieva, B.N. and Aripov, E.A.: (Chromatographic separation of some physiologically active substances in a thin-layer of natural mineral sorbents). *Dokl. Akad. Nauk Uzb. SSR*, No. 7 (1975) 40-41; *C.A.*, 85 (1976) 89510s.
- 5250 Gomez-Taylor, M.M., Kuehl, D. and Griffiths, P.R.: Vibrational spectrometry of pesticides and related materials on thin-layer chromatography adsorbents. *Appl. Spectrosc.*, 30 (1976) 447-452; *C.A.*, 85 (1976) 117802j.

- 5251 Hsu, L.S. and Liu, A.J.: (Preparation and application of adsorption sintered plates in thin-layer chromatography). *Hua Hsueh Tung Pao*, No. 3 (1976) 187-189; *C.A.*, 85 (1976) 130562a - a review.
- 5252 Issaq, H.J. and Barr, E.W.: Combined thin-layer chromatography/flameless atomic absorption method for the identification of inorganic ions and organometallic complexes. *Anal. Chem.*, 49 (1977) 189-190.
- 5253 Jupille, T.H. and Perry, J.A.: Programmed multiple development in thin-layer chromatography. *Science*, 194 (1976) 288-293; *C.A.*, 85 (1976) 188538p.
- 5254 Krueger, F.R.: Spaltfragment-induzierte Desorptions-Massenspektrometrie nichtflüchtiger dünnenschichtchromatographisch getrennter Substanzen. *Chromatographia*, 10 (1977) 151-153.
- 5255 Nemes, A.I.: Silica gel for thin-layer chromatography. *Rom. Pat.* 57,783 (Cl. C01b), 21 Oct. 1974, Appl. 67,396, 22 June 1971; 2 pp. Addn. to *Rom.* 57,736; *C.A.*, 85 (1976) 103519k.
- 5256 Okumura, T. and Kadono, T.: (Polymer-adsorber composite films). *Japan. Kokai* 76 23,492 (Cl. B01D,C08J,GO1N), 25 Feb. 1976, Appl. 74 96,708, 22 Aug. 1974; 5 pp.; *C.A.*, 85 (1976) 153564s.
- 5257 Pollak, V.: Fluorescence photometry of thin-layer chromatograms and electropherograms. *J. Chromatogr.*, 133 (1977) 49-57.
- 5258 Pollak, V.: Effect of non-uniform concentration distribution with depth upon quantitative optical analysis of chromatograms. *J. Chromatogr.*, 133 (1977) 195-198 - if variations in concentration in the depth are suspected, transmittance or fluorescence transmittance methods are to be preferred.
- 5259 Pollak, V.: Sensitivity and the dimensions of the separating medium in thin-layer chromatography. *J. Chromatogr.*, 133 (1977) 199-202 - for single-beam densitometry, sensitivity in areas with smaller zone area (square root); for double-beam and fluorometry measurements, increase in zone area improves the results. Reduction in thickness does not improve densitometry.
- 5260 Post, D.: Location of thin-layer chromatographic spots using UV light and tracing paper. *J. Chromatogr.*, 132 (1977) 130 - an outline of UV-absorbing spots is made on superposed tracing paper.
- 5261 Radmacher, E. and Wollenweber, P.: Elements for thin-layer chromatography. *U.S. Pat.* 3,922,431 (Cl. 428-327; B01 D) 25 Nov. 1975; Appl. 801.206, 20 Feb 1969, 5 pp.; *C.A.*, 85 (1976) 126361s.
- 5262 Schmidt, W. and Nemes, A.: (Test applicator for thin-layer chromatography). *Rev. Chim. (Bucharest)*, 27 (1976) 168-169; *C.A.*, 85 (1976) 96153f.
- 5263 Siouffi, A. and Guiochon, G.: (Use of microparticles of silica in thin-layer chromatography). *Analisis*, 4 (1976) 147-151; *C.A.*, 85 (1976) 171296k.
- 5264 Stahl, E. and Schilz, W.: (Extraction with super-critical gases in direct coupling with thin-layer chromatography. Applications to natural products chemistry). *Chem.-Ing.-Tech.*, 48 (1976) 773-778; *C.A.*, 85 (1976) 182306q.
- 5265 Tsydendambaev, V.D., Zhukov, A.V. and Vereshchagin, A.G.: Preparation of plates with a permanent adsorbent layer and their application in the analytical thin-layer chromatography of lipids. *J. Chromatogr.*, 132 (1977) 195-204 - silica-gel with 7 μm glass particles (1:3) heated to 67 $^{\circ}\text{C}$.
- 5266 Vinogradova, R.G., Romanov, F.L., Sasin, E.M. and Fedotova, M.D.: (KTKh.Ol equipment set for thin-layer chromatography). *Prib. Sist. Upr.*, 21, No. 5 (1976) 26-27; *C.A.*, 85 (1976) 179468p.

See also 5180, 5449.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

- 5267 Huc, A.Y., Roucache, J., Bernon, M., Caillet, G. and Da Silva, M.: (Application of thin-layer chromatography to the quantitative and qualitative study of rock extracts and oils). *Rev. Inst. Fr. Pet.*, 31, No. 1 (1976) 67-98; *C.A.*, 85 (1976) 145438p.
- 5268 Kunte, H. and Borneff, J.: (Detection process for polycyclic, aromatic hydrocarbons in water). *Z. Wasser Abwasser Forsch.*, 9, No. 2 (1976) 35-38; *C.A.*, 85 (1976) 182172t.
- 5269 Seifert, B.: Stability of benzo[*a*]pyrene on silica gel plates for high-performance thin-layer chromatography. *J. Chromatogr.*, 131 (1977) 417-421 - decrease in the intensity of spots on silica gel with time; paraffin impregnation protects from degradation.

- 5270 Thielemann, H.: (Experimental studies on the thin-layer chromatographic separation and identification of carcinogenic aromatic hydrocarbons in bank-filtered ground water). *Acta Hydrochim. Hydrobiol.*, 4 (1976) 183-184; *C.A.*, 85 (1976) 98942m.
- 5271 Woidich, H., Pfannhauser, W., Blaicher, G. and Tiefenbacher, K.: Zur dünnsschichtchromatographischen Trennung und *in-situ* Auswertung polycyclischer aromatischer Kohlenwasserstoffe. Versuche mit acetylierter Cellulose. *Chromatographia*, 10 (1977) 140-146.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

- 5272 Aiello, E., Plescia, S., Dattolo, G. and Monacelli, R.: (Identification and determination of mycotoxins (aflatoxins) in various species of oleaginous seeds and their toxicity). *Atti Acad. Sci., Lett. Arti Palermo, Parte 1*, 34 (1975) 137-143; *C.A.*, 85 (1976) 107551n.
- 5273 Calabrio, G. and Curro, P.: (Spectrofluorometric determination of the coumarins of bergamot essential oil). *Essenze Deriv. Agrum.*, 45 (1975) 246-262; *C.A.*, 85 (1976) 130356m.
- 5274 Issaq, H.J., Barr, E.W. and Zielinski, W.L., Jr.: Nondestructive distinction between aflatoxin B₁ and ethoxyquin in thin-layer chromatography. *J. Chromatogr.*, 132 (1977) 115-120 - *in situ* fluorescence spectra.
- 5275 Kovacs, F., Szathmary, C. and Palyusik, M.: (Data of determination of toxin-F-2 (zearealenone) by high-pressure liquid, gas and thin-layer chromatography). *Acta Vet. Acad. Sci. Hung.*, 25 (1975) 223-230; *C.A.*, 85 (1976) 141378w.

See also 5249.

9. OXO COMPOUNDS

- 5276 Burtseva, T.I., Glebko, L.I. and Ovodov, Yu.S.: Direct spectrophotometric thin-layer chromatography for determining malondialdehyde and β -formyl pyruvate produced by the periodate oxidation of some deoxy sugars. *J. Chromatogr.*, 131 (1977) 464-467.
- 5277 Lemmens, L.: Determination of dihydroxydianthrones by densitometry after thin-layer separation. *J. Chromatogr.*, 132 (1977) 363-365.
- 5278 Thielemann, H.: (Thin-layer chromatographic determination limits (semi-quantitative determination) of anthraquinones on various sorption layers using different detection agents). *Z. Chem.*, 16 (1976) 234; *C.A.*, 85 (1976) 103516g.

10. CARBOHYDRATES

10a. Mono- and oligosaccharides; structural studies

- 5279 Haldorsen, K.M.: Vanadium pentoxide in sulphuric acid, a general chromogenic spray reagent for carbohydrates. *J. Chromatogr.*, 134 (1977) 467-476 - TLC and PC.
- 5280 Lehle, L. and Schwarz, R.T.: Formation of dolichol monophosphate 2-deoxy-D-glucose and its interference with the glycosylation of mannoproteins in yeast. *Eur. J. Biochem.*, 67 (1976) 239-245 - TLC and PC.
- 5281 Lombard, A., Tourn, M.L. and Buffa, M.: *In situ* reactions on silica gel thin layers in studies on plant oligosaccharides. *J. Chromatogr.*, 134 (1977) 242-245 - acid or β -fructosidase hydrolysis on silica gel layers between two developments.
- 5282 Papin, J.-P. and Udiman, M.: Chromatographie sur couche mince des principaux cétoses. *J. Chromatogr.*, 132 (1977) 339-343 - R_F values of 16 ketoses in 12 solvent systems.
- 5283 Waldemar, L., Trznadel, K. and Lech, W.: (A simple method for the quantitative determination of myoinositol in serum and urine). *Pol. Tyg. Lek.*, 31 (1976) 711-713; *C.A.*, 85 (1976) 139388f.

5284 Walkley, J.W. and Tillman, J.: A simple thin-layer chromatographic technique for the separation of mono- and oligosaccharides. *J. Chromatogr.*, 132 (1977) 172-174.

See also 5185, 5186, 5188.

10b. Polysaccharides, mucopolysaccharides and lipopolysaccharides

5285 Hyánek, J., Hasanová, M., Kunová, V. and Kubík, M.: (Determination of the commonly known mucopolysaccharides by thin-layer chromatography). *Biochem. Clin. Bohemoslov.*, 5 (1976) 11-18.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

- 5286 Daniels, E.G.: Chromatography of prostaglandins. In: G.V. Marinetti (Editor): *Lipid Chromatographic Analysis*, Marcel Dekker, New York, 2nd ed., 1976, pp. 611-662 - a review with 139 references.
- 5287 Dünge, W.: 4-Bromomethyl-7-methoxycoumarin as a new fluorescence label for fatty acids. *Anal. Chem.*, 49 (1977) 442-445.
- 5288 Pace-Asciak, C.R. and Rangaraj, G.: Distribution of prostaglandin biosynthetic pathways in several rat tissues. Formation of 6-ketoprostaglandin F_{1α}. *Biochim. Biophys. Acta*, 486 (1977) 579-582.

11b. Lipids and their constituents

- 5289 Abdel-Latif, A.A., Akhtar, R.A. and Hawthorne, J.N.: Acetylcholine increases the breakdown of triphosphoinositide of rabbit iris muscle prelabelled with [³²P] phosphate. *Biochem. J.*, 162 (1977) 61-73.
- 5290 Babaskin, P.M.: (Determining lipid composition of biological fluids by extraction with chloroform-methanol and thin-layer chromatography). *U.S.S.R. Pat. Appl.* 526,824 (Cl. GO1N 33/16), 30 Aug. 1976; *Appl.* 2,146,640, 20 June 1975; *C.A.*, 85 (1976) 173864t.
- 5291 Bailey, D.S. and Northcote, D.H.: Phospholipid composition of the plasma membrane of the green alga, *Hydrodictyon africanum*. *Biochem. J.*, 156 (1976) 295-300.
- 5292 Ban, P. and Mihailescu, M.: (Analytical study of some indigenous glyceride products in view of their utilization as ointment bases. Note II). *Farmacia (Bucharest)*, 24 (1976) 125-128; *C.A.*, 85 (1976) 166580u.
- 5293 Dawson, G. and Oh, J.Y.: Blood glucosylceramide levels in Gaucher's disease and its distribution amongst lipoprotein fractions. *Clin. Chim. Acta*, 75 (1977) 149-153.
- 5294 Gardas, A.: A structural study on a macroglycolipid containing 22 sugars isolated from human erythrocytes. *Eur. J. Biochem.*, 68 (1976) 177-183.
- 5295 Ishida-Ichimasa, M., Ichimasa, Y. and Uranaka, K.: Fluorometric determination of lipids on a thin-layer chromatogram sprayed with 2',7'-dichlorofluorescein. *Agr. Biol. Chem.*, 40 (1976) 1253-1254; *C.A.*, 85 (1976) 119052p.
- 5296 Joyard, J. and Douce, R.: Site of synthesis of phosphatidic acid and diacylglycerol in spinach chloroplasts. *Biochim. Biophys. Acta*, 486 (1977) 273-285.
- 5297 Kiss, Z.: Possible phospholipid precursor for phosphatidylserine in rat heart. *Eur. J. Biochem.*, 67 (1976) 557-561.
- 5298 Kuksis, A.: Routine chromatography of simple lipids and their constituents. *J. Chromatogr.*, 143 (1977) 3-30 - a review with 195 references; TLC, CC, GC.
- 5299 MacDonald, R.C. and Rempas, S.P.: Dry column chromatography of phospholipids. *J. Chromatogr.*, 131 (1977) 157-168 - TLC monitoring of the distribution in the column.
- 5300 McKibbin, J.M., Smith, E.L., Mansson, J.E. and Li, Y.T.: Characterization of dog small intestinal fucolipids with human blood group A activity. Differences in dog and human A-active fucolipids. *Biochemistry*, 16 (1977) 1223-1228.
- 5301 Manak, N.A. and Taganovich, A.D.: (Chromatographic method for determining lipids and phospholipids in blood serum). In: A.S. Vecher (Editor): *Tezisy Dokl.-Konf. Beloruss. Biokhim. O-va*, 2nd, Nauka i Tekhnika, Minsk 1974, p.41; *C.A.*, 85 (1976) 155920d.

- 5302 Marinetti, G.V. (Editor): *Lipid Chromatographic Analysis*. Vols. 1+2, Marcel Dekker, New York, 2nd ed., 1976, 388 pp. + 374 pp.; C.A., 85 (1976) 89772d - all the types of chromatographic techniques.
- 5303 Mulay, S., Khamsi, F. and Solomon, S.: Quantification of dipalmitoyl lecithin in lung wash and extracts. *Anal. Biochem.*, 77 (1977) 350-361.
- 5304 Renkonen, O. and Luukonen, A.: Thin-layer chromatography of phospholipids and glycolipids. In: G.V. Marinetti (Editor): *Lipid Chromatographic Analysis*, Marcel Dekker, New York, 2nd ed., 1976, pp. 1-58; C.A., 85 (1976) 89463d.
- 5305 Reuvers, F., Habets-Willems, C., Reinking, A. and Boer, P.: Glycolipid intermediates involved in the transfer of N-acetylglucosamine to endogenous proteins in a yeast membrane preparation. *Biochim. Biophys. Acta*, 486 (1977) 541-552.
- 5306 Sass, N.L., Alvarado, R. and Martin, J.P.: A more specific indicator for use in the determination of amniotic fluid lecithin/sphingomyelin ratios. *Biochem. Med.*, 15 (1976) 217-219; C.A., 85 (1976) 106208u.
- 5307 Sengupta, P., Sen, A.R., Sil, S. and Roy, B.R.: Detection of sunflowerseed oil in other oils by thin-layer chromatography. *Res. Ind.*, 20 (1975) 208-209; C.A., 85 (1976) 92269a.
- 5308 Stoffel, W., Bister, K., Schreiber, C. and Tunggal, B.: ^{13}C -NMR studies of the membrane structure of enveloped virions (vesicular stomatitis virus). *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 905-915.
- 5309 Stoffel, W., Salm, K. and Körkemeier, U.: Biosynthetic incorporation of fatty acids with photosensitive groups into membrane lipids of cells in tissue cultures. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 917-924.
- 5310 Stoffel, W. and Michaelis, G.: Biosynthetic labelling of membrane lipids of eucaryotic cells in tissue culture by a novel type of fluorescent fatty acids. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 925-935.
- 5311 Stremmel, W. and Debuch, H.: Bis(monoacylglycerin)phosphorsäure - ein Marker-Lipid sekundärer-Lysosomen? *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 803-810.
- 5312 Taranova, N.P.: (Isolation of purified lipid fractions from nervous tissue by means of step-wise chromatography in studies using carbon-14). *Vopr. Med. Khim.*, 22 (1976) 567-569; C.A., 85 (1976) 119004z.
- 5313 Veh, R.W., Corfield, A.P., Sander, M. and Schauer, R.: Neuraminic acid-specific modification and tritium labelling of gangliosides. *Biochim. Biophys. Acta*, 486 (1977) 145-160.
- 5314 Verhagen, J., Bouman, A.A., Vliegenthart, J.F.G. and Boldingh, J.: Conversion of 9-D- and 13-L-hydroperoxylinoleic acids by soybean lipoxygenase-1 under anaerobic conditions. *Biochim. Biophys. Acta*, 486 (1977) 114-120.
- 5315 Wassef, M.K. and Hendrix, J.W.: Ceramide aminoethylphosphate in the fungus *Pythium prolatum*. *Biochim. Biophys. Acta*, 486 (1977) 172-178 - TLC and PC.

See also 5265.

13. STEROIDS

- 5316 Baranowska, B.: A modified method of thin-layer chromatography for separation of 17-ketosteroids. *Mater. Med. Pol. (Engl. Ed.)*, 8 (1976) 31-35; C.A., 85 (1976) 89520v.
- 5317 Gleispach, H.: Dünnschichtchromatographische Probleme bei der Cortisol-bestimmung mittels Proteinbindungstechnik. *Chromatographia*, 10 (1977) 40-44.
- 5318 Hardman, R. and Benjamin, T.V.: Quantitative determination of phytoecdysones as illustrated by application to species of *Helleborus*. *J. Chromatogr.*, 131 (1977) 468-470.
- 5319 Jarć, H., Ruttner, O. and Krocza, W.: Der quantitative Nachweis von Östrogenen und Thyreostatika mittels Dünnenschichtchromatographie und Hochleistungs-dünnenschichtchromatographie in tierischen Substraten. *J. Chromatogr.*, 134 (1977) 351-358.
- 5320 Lisboa, B.P.: Thin-layer chromatography of sterols and steroids. In: G.V. Marinetti (Editor): *Lipid Chromatographic Analysis*, Vol. 2, Marcel Dekker, New York, 2nd ed., 1976, pp. 339-478; C.A., 85 (1976) 136928w - a review with 338 references.

- 5321 Peter, F. and Reynolds, R.G.: Quantitative analysis of human serum cholesterol by thin-layer chromatographic spot test. *J. Chromatogr.*, 143 (1977) 153-160.
- 5322 Raicis, A., Klasons, A. and Ars, F.: (Thin-layer chromatographic determination of cholesterol and cholesterol esters in blood serum and bile). *Uch.-Med. Latv. SSR-Prakt. Zdravookhr.*, 1 (1975) 131-133; *C.A.*, 85 (1976) 139329n.
- 5323 Regerat, F., Pourrat, H. and Pourrat, A.: Recherche de l'ergostérol dans les carpophores de quelques macromycètes. *Ann. Pharm. Fr.*, 34 (1976) 231-235.
- 5324 Shalon, Y. and Elliott, W.H.: Bile acids. LII. The synthesis of 24-nor-5 α -cholic acid and its 3 β -isomer. *Steroids*, 28 (1976) 655-665.
- 5325 Stanciu, T.: (Comments on the study of the densitometric determination of steroid hormones). *Farmacia (Bucharest)*, 24, No. 2 (1976) 103-106; *C.A.*, 85 (1976) 166688k.
- 5326 Touche, J., Derbesy, M., Cas, M. and Estienne, J.: (Study of sterol analysis in fatty substances). *Ann. Falsif. Expert. Chim.*, 68 (1975) 99-112; *C.A.*, 85 (1976) 190883r.

See also 5195.

14. STEROID GLYCOSIDES AND SAPONINS

- 5327 Faber, D.B., De Kok, A. and Brinkman, U.A.Th.: Thin-layer chromatographic method for the determination of digitoxin in human serum. *J. Chromatogr.*, 143 (1977) 95-103.
- 5328 Minchev, A., Panova, D. and Nikolov, S.: (Thin-layer chromatographic separation of a steroid saponin mixture from *Ruscus hypoglossum* L. in the cyclohexane-isopropyl alcohol system). *Farmatsiya (Sofia)*, 25, No. 5 (1975) 21-26; *C.A.*, 85 (1976) 155901y.
- 5329 Vlasenko, L.M.: (Determination of digoxin in forensic chemical analysis). *Farmatsiya (Moscow)*, 25, No. 4 (1976) 45-49; *C.A.*, 85 (1976) 117493j.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

- 5330 Baiswara, R.B., Nair, K.N.G. and Mathew, T.V.: Detection of adulteration of palmarosa oil with gingergrass oil by thin-layer chromatography. *Res. Ind.*, 21, No. 1 (1976) 37-39; *C.A.*, 85 (1976) 148975x..
- 5331 Baiswara, R.B., Chaurasia, L.O., Nair, K.N.G. and Mathew, T.V.: Detection of gingergrass oil in lemongrass oil by thin-layer chromatography. *Res. Ind.*, 21, No. 1 (1976) 39-40; *C.A.*, 85 (1976) 148976y.
- 5332 Evans, F.J., Schmidt, K.J. and Kinghorn, A.D.: A microtechnique for the identification of diterpene ester inflammatory toxins. *Biomed. Mass Spectrom.*, 2, No. 3 (1975) 126-130; *C.A.*, 85 (1976) 143324z.
- 5333 Munshi, G.K.: Detection of glycyrrhetic acid by TLC. *Indian J. Pharm.*, 38, No. 4 (1976) 105-106; *C.A.*, 85 (1976) 149174x.
- 5334 Wood, N.F. and Snoeyink, V.L.: 2-Methylisoborneol, improved synthesis and a quantitative gas chromatographic method for trace concentrations producing odor in water. *J. Chromatogr.*, 132 (1977) 405-420.

16. NITRO AND NITROSO COMPOUNDS

- 5335 Hanus, V., Hofman, M., Kohlíček, J., Nováková, E. and Silinek, K.: (Contribution to the metabolism of picric acid). *Biochem. Clin. Bohemoslov.*, 5 (1976) 39-45 - TLC and PC.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

- 5336 Bordun, M., O'Connor, J.M., Padmanabhan, G.R. and Mollica, J.A.: Thin-layer chromatographic determination of hydrazine in aqueous and alcoholic media. *Anal. Chem.*, 49 (1977) 161-162.
- 5337 Ciarlane, A.E., Gangarosa, L.P. and Fong, B.C.: Detection of *p*-chloroaniline in chlorhexidine solutions using thin-layer chromatography. *J. Dent. Res.*, 55 (1976) 918; *C.A.*, 85 (1976) 182475u.
- 5338 Dilli, S. and Patsalides, E.: Chromatographic separation of isomeric forms of tetradeятate Shiff base derived from 1,1,1-trifluoro-5-dimethylhexane-2,4-dione and 1,2-diaminoethane. *J. Chromatogr.*, 134 (1977) 477-482.
- 5339 Kummer, P. and Buergin, E.: (New data on the quantitative determination of carboxylic acid (fatty acid) 5-hydroxytryptamides in coffee). *Mitt. Geb. Lebensmittelunters. Hyg.*, 67 (1976) 212-225; *C.A.*, 85 (1976) 121926v.
- 5340 Preda, N., Popa, L., Sendrea, D. and Galea, V.: (Thin-layer chromatographic methods applied to the study of N-nitroso organic(nitrosamine) compounds). *Rev. Ig. Bacteriol., Virusol. Parazitol., Epidemiol., Pneumoftiziol., Ig.*, 24 (1975) 43-46; *C.A.*, 85 (1976) 158018b.
- 5341 Seiler, N. and Knödgen, B.: Chromatography of Dns derivatives on precoated high-performance thin-layer chromatographic plates. *J. Chromatogr.*, 131 (1977) 109-119 - positions of spots of some 12 Dns-amines and 25 amino acids; chemical stability of Dns derivatives on HPTLC can be improved by triethanolamine spray.

18. AMINO ACIDS

- 5342 Ahlbehrendt, I.: (A simple thin-layer chromatographic method for separating amino acids in urine). *Z. Med. Labortech.*, 17 (1976) 143-145; *C.A.*, 85 (1976) 173617q.
- 5343 Angerer, J.: (Occupational chronic exposure to organic solvents. IV. Thin-layer chromatographic-densitometric determination of hippuric acid in urine). *Int. Arch. Occup. Environ. Health*, 36 (1976) 287-297; *C.A.*, 85 (1976) 138104y.
- 5344 Brüsewitz, G., Cameron, B.D., Chasseaud, L.F., Görler, K., Hawkins, D.R., Koch, H. and Mennicke, W.H.: The metabolism of benzyl isothiocyanate and its cysteine conjugate. *Biochem. J.*, 162 (1977) 99-107.
- 5345 Filipovic, N.: The determination of some amino acids in the central nervous system by thin-layer chromatography. *Croat. Chem. Acta*, 48 (1976) 379-383; *C.A.*, 85 (1976) 173663b.
- 5346 Goldberg, W.M.: Complete separation of iodotyrosine-iodohistidine-iodide mixtures on thin-layer plates with a single-solvent system. *J. Chromatogr.*, 134 (1977) 246-248.
- 5347 Kupec, J. and Turina, S.: The determination of some amino acids by conventional and hot plate chromatography. *Chromatographia*, 10 (1977) 157-159.
- 5348 Nakamura, H.: Thin-layer chromatography of histidine, histamine and histidyl peptides at picomole level using a unique fluorogenic reaction with fluorescamine. *J. Chromatogr.*, 131 (1977) 215-222.
- 5349 Pollock, G.E., Cheng, C.N. and Cronin, S.E.: Determination of the D and L isomers of some protein amino acids present in soils. *Anal. Chem.*, 49 (1977) 2-7.
- 5350 Wolfram, J.H., Feinberg, J.I., Doerr, R.C. and Fiddler, W.: Determination of N-nitrosoproline at the nanogram level. *J. Chromatogr.*, 132 (1977) 37-43 - proline is reacted with 7-chloro-4-nitrobenzo-2-oxo-1,3-diazole to NBD-proline which may be isolated by TLC and determined by fluorimetry after elution.

See also 5196.

19. PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

19a. Peptides (including peptidic and proteinous hormones)

- 5351 Andary, C., Enjalbert, F., Privat, G. and Mandrou, B.: Dosage des amatoxines par spectrophotométrie directe sur chromatogramme chez *Amanita phalloides* Fries (Basidiomycetes). *J. Chromatogr.*, 132 (1977) 525-532.
- 5352 Kasafirek, E., Fric, P., Slabý, J. and Malis, F.: *p*-Nitroanilides of 3-carboxypropionyl-peptides. Their cleavage by elastase, trypsin and chymotrypsin. *Eur. J. Biochem.*, 69 (1976) 1-13.
- 5353 Pinker, T.G., Young, G.T., Elliott, D.F. and Wade, R.: Aminoacids and peptides. Part XXXIX. Synthesis and analogues of bradykinin with modifications in position 1, 6 and 9. *J. Chem. Soc., Perkin Trans. I*, (1976) 220-228.

19b. Elucidation of structure of proteins

- 5354 Chang, J.Y. and Creaser, E.H.: Improved chromatographic identification of coloured amino acid thiohydantoins. *J. Chromatogr.*, 132 (1977) 303-307.
- 5355 Chen, R.: The sequence determination of a protein in micro scale: the sequence analysis of ribosomal protein L 34 of *Escherichia coli*. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 873-886.
- 5356 Dreker, L., Schwarz, J., Reichel, W. and Hilschmann, N.: Zur Strukturregel der Antikörper. Die Primärstruktur eines monoklonalen IgG 1-Immunoglobulins (Myelomprotein Nie), I. Reinigung und Charakterisierung des Proteins, der L- und H-Ketten, der Bromcyan-spaltprodukte und der Disulfidbrücken. *Hoppe-Seyler's Z. Physiol. Chem.*, 357 (1976) 1515-1540.

20. PROTEINS INCLUDING ENZYMES

- 5357 Kanno, T. and Sudo, K.: Properties of amylase-linked immunoglobulins. *Clin. Chim. Acta*, 76 (1977) 67-77.
- 5358 Salkie, M.L., Hannah, C.L. and McNeil, E.M.: The effects of anti-rheumatoid drugs on the *in vitro* activity of human serum hyaluronidase. *Clin. Biochem.*, 9 (1976) 184-187.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

- 5359 Issaq, H.J. and Barr, E.W.: Detection reagent for adenine, quanine, uracil, cytosine and their alkylated bases, nucleotides and nucleosides on thin-layer plates. *J. Chromatogr.*, 132 (1977) 121-127 - chlorination with gaseous $\text{Cl}_2\text{-ClO}_2$ and spraying with *o*-tolidine and KI was tested for some 44 compounds.
- 5360 Issaq, H.J., Barr, E.W. and Zielinski, W.L., Jr.: Separation of alkylated guanines, adenines, uracils and cytosines by thin-layer chromatography. *J. Chromatogr.*, 131 (1977) 265-273 - R_F tables for 34 compounds.
- 5361 Kasai, H., Murao, K., Nishimura, S., Liehr, J.G., Crain, P.F. and McCloskey, J.A.: Structure determination of a modified nucleoside isolated from *Escherichia coli* transfer ribonucleic acid. *Eur. J. Biochem.*, 69 (1976) 436-444.
- 5362 Kröger, M. and Cramer, F.: Basenkatalysierte N-Glycosidhydrolyse nach Alkylierung von 2-Thiocytidin mit Iodacetamid. *Chem. Ber.*, 110 (1977) 361-370.
- 5363 Murphy, M.J., Goldman, E.J. and Ludlum, D.B.: Synthesis of polynucleotides which contain 3,N⁴-ethanocytidine, a nucleoside modification resulting from the action of bis(chloroethyl)nitrosourea. *Biochim. Biophys. Acta*, 475 (1977) 446-452.
- 5364 Osborne, N.N. and Neuhoff, V.: Preliminary study of the use of dansyl chloride to determine cyclic-3',5'-AMP in tissues. *J. Chromatogr.*, 134 (1977) 489-496 - position for some 17 Dns compounds.

- 5365 Pless, R.C. and Ts'o, P.O.P.: Duplex formation of a nonionic oligo(deoxy-thymidylate) analogue [heptadeoxythymidylyl-(3',5')-deoxythymidine] heptaethyl ester (d-[Tp(Et)]₇T) with poly(deoxyadenylate). Evaluation of the electrostatic interaction. *Biochemistry*, 16 (1977) 1239-1250 - TLC and PC.
- 5366 Reyes, P.: The rapid separation of orotate, orotidylate and uridylate by thin-layer chromatography. *Anal. Biochem.*, 77 (1977) 362-369.
- 5367 Wyers, F., Huet, J., Sentenac, A. and Fromageot, P.: Role of DNA-RNA hybrids in eukaryotes. *Eur. J. Biochem.*, 69 (1976) 385-395.

See also 5205.

22. ALKALOIDS

- 5368 Balderstone, P. and Dyke, S.F.: Detection and quantitative analysis of sanguinarine in edible oils. *J. Chromatogr.*, 132 (1977) 359-362.
- 5369 Besyadetskaya, E.I. and Krylova, E.L.: (Production of sanguinarine hydrochloride and investigation of its physical properties). *Farm. Zh. (Kiev)*, 31, No. 2 (1976) 69-71; *C.A.*, 85 (1976) 166549r.
- 5370 Korzhavykh, E.A.: (Analysis of belladonna alkaloids in some drugs). *Farm. Zh. (Kiev)*, 31, No. 4 (1976) 43-46; *C.A.*, 85 (1976) 166692g.
- 5371 Ong, H. and Bélieveau, J.: Alcaloïdes du *Thalictrum dioicum*: isolement et élucidation structurale de la thalidicine, nouvel alcaloïde du *Thalictrum dioicum*. *Ann. Pharm. Fr.*, 34 (1976) 223-230.
- 5372 Prosek, M., Kucan, E., Katic, M. and Bano, M.: Quantitative fluorodensitometric determination of ergot alkaloids. III. The total assay of the alkaloids. *Chromatographia*, 10 (1977) 147-150.
- 5373 Rücker, G. and Taha, A.: The use of π-acceptors for detection of alkaloids on thin-layers. *J. Chromatogr.*, 132 (1977) 165-167.

See also 5208, 5249.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

- 5374 Ehmann, A.: The van Urk-Salkowski reagent - a sensitive and specific chromogenic reagent for silica gel thin-layer chromatographic detection and identification of indole derivatives. *J. Chromatogr.*, 132 (1977) 267-276 - p-dimethylamino-benzaldehyde and HCl in ethanol mixed with FeCl₃ in aqueous H₂SO₄. Colours and detection limits are tabulated for 79 indoles.
- 5375 Hui, K.S. and Davis, B.A.: Postulated tetraphenylporphyrin-zinc tetraphenyl-porphyrin sandwich complex. *J. Chromatogr.*, 132 (1977) 131-135.
- 5376 Jakovljevic, I.M., Bishara, R.H. and Kress, T.J.: Thin-layer chromatographic separation of several chloro- and methyl-substituted 2-aminopyridines. *J. Chromatogr.*, 134 (1977) 238-241 - 15 compounds were studied.
- 5377 Marklová, E. and Hais, I.M.: Chromatographic behaviour of some indole acids on a Sephadex column in water and in the presence of salts. *J. Chromatogr.*, 131 (1977) 205-213.
- 5378 Oliver, R.W.A. and Walmsley, T.A.: A thin-layer chromatographic method for the separation and identification of the tryptophan metabolites present in whole human urine. *Acta Vitaminol. Enzymol.*, 29 (1975) 40-47; *C.A.*, 85 (1976) 155911b.
- 5379 Wagner, H. and Lehmann, H.: Nachweis von N-Heterocyclen auf Chromatogrammen und Pherogrammen durch Fluoreszenz und Fluoreszenz-Thermochromie. *Z. Anal. Chem.*, 283 (1977) 115-119.
- 5380 Zherébtsov, I.P., Lopatinskii, V.P., Yudina, S.P., Rovkina, N.M., Grabanchuk, E.N. and Semenova, V.I.: (Study of the chemistry of carbazole derivatives. 98. Thin-layer chromatographic determination of carbazole and derivatives). *Izv. Tomsk. Politekhn. In-ta*, No. 272 (1976) 198-206; *C.A.*, 85 (1976) 201756e.

24. ORGANIC SULPHUR COMPOUNDS

- 5381 Czerwiec, Z. and Maleta, E.: Separation of aromatic sulphonylamines by thin-layer chromatography. *J. Chromatogr.*, 132 (1977) 168-171.
- 5382 Hintze, G.: (Thin-layer chromatography of shale oil products). *Compend.-Dtsch. Ges. Mineraloelwiss. Kohlechem.*, 75-76 (1975) 586-593; *C.A.*, 85 (1976) 163082x.
- 5383 Popova, A.G., Ivanov, A.V. and Lerman, Z.A.: (Determination of the composition of products obtained by oxidizing 4,4'-dinitrodiphenyl sulfide by thin-layer chromatography). *Zh. Anal. Khim.*, 31 (1976) 408-409; *C.A.*, 85 (1976) 103485w.
- 5384 Trost, B.M., Salzmann, T.N. and Hiroi, K.: New synthetic reactions. Sulfenylation and dehydrosulfenylation of esters and ketones. *J. Amer. Chem. Soc.*, 98 (1976) 4887-4902.

See also 5210.

25. ORGANIC PHOSPHORUS COMPOUNDS

- 5385 Maile, R.J., Jr., Fischesser, G.J. and Anderson, M.M.: Thin-layer chromatographic separation of phosphonic acid derivatives. *J. Chromatogr.*, 132 (1977) 366-368.
- 5386 Ranny, M.: (Use of thin-layer chromatography in the production of glycerol dihydrogen phosphate). *Veda Vysk. Potravin. Prum.*, 26 (1974) 221-232; *C.A.*, 85 (1976) 201748d.

See also 5212.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

- 5387 Figge, K., Koch, J. and Lubba, H.: Beitrag zur gaschromatographischen Analyse von Organozinn-Stabilisatoren für Polyvinylchlorid. *J. Chromatogr.*, 131 (1977) 317-327 - radiometry of ^{123}I by planimetry of scans and by liquid scintillation of eluates.
- 5388 Kataeva, S.E. and Sofris, E.S.: (Thin-layer chromatographic determination of organotin stabilizers in biological materials). *Gig. Tr. Prof. Zabol.*, No. 9 (1976) 55-56; *C.A.*, 85 (1976) 188547r.
- 5389 Kazarinova, N. and Kozitskaya, L.: (Determination of organotin compounds in a thin layer of sorbent by a chromatographic method). *Ukr. Khim. Zh.*, 42, No. 5 (1976) 526-528; *C.A.*, 85 (1976) 95066t.
- 5390 Kimmel, E.C., Fish, R.H. and Casida, J.E.: Bioorganotin chemistry. Metabolism of organotin compounds in microsomal monooxygenase systems and in mammals. *J. Agr. Food Chem.*, 25 (1977) 1-9.

27. VITAMINS AND VARIOUS GROWTH FACTORS

- 5391 Adachi, A. and Kobayashi, T.: (Studies on the method for determination of vitamin D by gas chromatography. 4. Gas-liquid chromatographic determination of vitamin D in various kinds of commercial multivitamin preparations). *Vitamins*, 50 (1976) 351-375; *C.A.*, 85 (1976) 182458r.
- 5392 Rittich, B., Simek, M. and Coupek, J.: Separation of naphthoquinones and lipophilic vitamins by gel and thin-layer chromatography. *J. Chromatogr.*, 133 (1977) 345-348 - polyethylene glycol-impregnated silica gel.
- 5393 Scola-Nagelschneider, G. and Hemmerich, P.: Synthesis, separation, identification and interconversion of riboflavine phosphates and their acetyl derivatives: a reinvestigation. *Eur. J. Biochem.*, 66 (1976) 567.

28. ANTIBIOTICS

- 5394 Borowiecka, B.: Spectrophotometric and chromatographic determinations of kanamycin A in pharmaceutical preparations. *Pol. J. Pharmacol. Pharm.*, 28 (1976) 353-359; *C.A.*, 85 (1976) 198209w.
- 5395 Daum, S.J., Rosi, D. and Goss, W.A.: Mutational biosynthesis of idiotrophs of *Micromonospora purpurea* II. Conversion of non-amino containing cyclitols to aminoglycoside antibiotics. *J. Antibiot.*, 30 (1977) 98-105.
- 5396 Grabowska, I., Pawelczak, I., Weclawska, K. and Regosz, A.: (Colorimetric determination of anhydroerythromycin in Makrocyklin POLFA tablets). *Ann. Acad. Med. Gedanensis*, 5 (1975) 141-154; *C.A.*, 85 (1976) 99250w.
- 5397 Herada, S. and Kishi, T.: Isolation and characterization of a new nucleoside antibiotic, amipurimycin. *J. Antibiot.*, 30 (1977) 11-16 - TLC and PC.
- 5398 Issaq, H.J., Barr, E.W., Wei, T., Meyers, C. and Aszalos, A.: Thin-layer chromatographic classification of antibiotics exhibiting antitumor properties. *J. Chromatogr.*, 133 (1977) 291-301 - 151 compounds; bioautography with 5 microorganisms.
- 5399 Kobrehel, G., Tamburasev, Z. and Djokić, S.: Erythromycin series. IV. Thin-layer chromatography of erythromycin, erythromycin oxime, erythromycylamine and their acyl derivatives. *J. Chromatogr.*, 133 (1977) 415-419 - R_F values for 12 compounds; ΔR_F values for various pairs.
- 5400 Lazarevski, T., Tamburasev, Z. and Djokić, S.: Erythromycin series. V. Quantitative analysis of cladinose and methylcladinose by densitometry of thin-layer chromatograms. *J. Chromatogr.*, 132 (1977) 309-313.
- 5401 Milhaud, G., Pinault, L. and Moretain, J.P.: (Characterization of penicillins in ointments designated to be injected into the udder of milk cows by the galactophore route). *Ann. Falsif. Expert. Chim.*, 68 (1975) 191-199; *C.A.*, 85 (1976) 198226z.
- 5402 Naito, T., Nakagawa, S., Narita, Y. and Kawaguchi, H.: Chemical modification of sorbistin. I. N-acyl analogs of sorbistin. *J. Antibiot.* 29 (1976) 1286-1296.
- 5403 Ragazzi, E. and Veronese, G.: Simple method for the quantitative analysis of tetracyclines by direct fluorimetry after thin-layer chromatography on cellulose plates. *J. Chromatogr.*, 132 (1977) 105-114.
- 5404 Rosi, D., Goss, W.A. and Daum, S.J.: Mutational biosynthesis by idiotrophs of *Micromonospora purpurea*. I. Conversion of aminocyclitols to new aminoglycoside antibiotics. *J. Antibiot.*, 30 (1977) 88-97.
- 5405 Sato, S., Takasawa, S., Sato, T., Yamamoto, M., Okachi, R., Kawamoto, I., Iida, T., Morikawa, A. and Nara, T.: A new aminoglycoside antibiotic complex - the seldomycins. II. Isolation, physicochemical and chromatographic properties. *J. Antibiot.*, 30 (1977) 25-30.
- 5406 Shoji, J., Kato, T., Matsumoto, K., Takahashi, Y. and Mayama, M.: Production and isolation of cerebaxins C and D. *J. Antibiot.*, 29 (1976) 1281-1285.
- 5407 Troonen, H., Roelants, P. and Boon, B.: Rit 2214, a new biosynthetic penicillin produced by a mutant of *Cephalosporium acremonium*. *J. Antibiot.*, 29 (1976) 1258-1268.
- 5408 Vilim, A., Lebel, M.J., Wilson, W.L. and Graham, K.C.: A simple thin-layer chromatographic identification procedure for erythromycin base, stearate, estolate and ethylsuccinate. *J. Chromatogr.*, 133 (1977) 239-244.
- 5409 Wang, Y. and Wang, R.T.: (Simple and rapid thin-layer chromatography of cephalosporin antibiotics). *Hua Hsueh*, No. 3 (1975) 85-88; *C.A.*, 85 (1976) 112784v.

See also 5215.

29. INSECTICIDES AND OTHER PESTICIDES

- 5410 Ambrosi, D. and Helling, C.S.: Leaching of oxadiazon and phosalone in soils. *J. Agr. Food Chem.*, 25 (1977) 215-217.
- 5411 Ambrus, A. and Hargitai, E.: (Identification and quantitative determination of benomyl and its metabolite residues using thin-layer chromatographic techniques). *Environ. Qual. Saf., Suppl.*, 3 (1975) 113-118; *C.A.*, 85 (1976) 117793g.

- 5412 Bykhovets, A.I.: (Thin-layer chromatographic method to determine Basudin and Valexon in a plant sample). *Aktual. Vopr. Zashch. Rast. BSSR, Mater. Resp. Konf. Molodykh Uch.*, 1st, (1974) 81-82; *C.A.*, 85 (1976) 187585q.
- 5413 Deleu, R., Barthelemy, J.-P. and Copin, A.: Identification de onze herbicides du groupe des urées substituées par chromatographie sur couche mince et en phase gazeuse. I. Application aux eaux naturelles. *J. Chromatogr.*, 134 (1977) 483-488.
- 5414 De Vos, R.H.: The analysis of benomyl residues in crop samples by a TLC-bio-assay method. *Environ. Qual. Saf., Suppl.*, 3 (1975) 119-123; *C.A.*, 85 (1976) 92279d.
- 5415 Dumitrescu, H., Barduta, Z. and Dumitrescu, D.: (Determination of organophosphorus insecticides by thin-layer chromatography and enzymic detection). *Rev. Ig., Bacteriol., Virusol., Parazitol., Epidemiol. Pneumoftiziol., Ig.*, 25, No. 1 (1976) 39-42; *C.A.*, 85 (1976) 121884e.
- 5416 Ernst, G.F., Pieterse, C. and Martens, L.J.H.: Comparison of drosophila, rat-liver and bee-head esterases in detecting residues of organophosphorus and carbamate pesticides in vegetables and fruits. *J. Chromatogr.*, 133 (1977) 245-251 - R_F dichlorvos values and limits of detection with the 3 esterases (with naphthyl acetate as substrate) for 65 pesticides.
- 5417 Fleeler, J.R. and Lacy, H.M.: Photolysis of methyl 2-benzimidazolecarbamate. *J. Agr. Food Chem.*, 25 (1977) 51-55 - TLC and PC.
- 5418 Gaughan, L.C., Unai, T. and Casida, J.E.: Permethrin metabolism in rats. *J. Agr. Food Chem.*, 25 (1977) 9-17.
- 5419 Kosmatyi, E.S., Bublik, L.I. and Kavetskii, V.N.: (Use of polarography and oscillopolarography for determination and study of the transformation of pesticides in the environment). *Nov. Polyarogr., Tezisy Dokl. Vses. Soveshch. Polyarogr.*, 6th, (1975) 186; *C.A.*, 85 (1976) 187587s - TLC and PC.
- 5420 Kováč, J. and Henselová, M.: Detection of triazine herbicides in soil by a Hill-reaction inhibition technique after thin-layer chromatography. *J. Chromatogr.*, 133 (1977) 420-422 - inhibition of the reduction of 2,6-dichlorophenolindophenol by illuminated bean chloroplasts.
- 5421 McBlain, W.A., Currie, R.W. and Wolfe, F.H.: Facile route to the resolution of the enantiomers of 1-chloro-2-[2,2,2-trichloro-1(4-chlorophenyl)ethyl]benzene (*o,p'*-DDT). *J. Agr. Food Chem.*, 25 (1977) 59-63.
- 5422 Parlar, H., Nitz, S., Gab, S. and Korte, F.: A contribution to the structure of the toxaphene components. Spectroscopic studies on chlorinated borane derivatives. *J. Agr. Food Chem.*, 25 (1977) 68-72.
- 5423 Petukhov, R.D.: Determination of Anthio and phosphamide in honey. *Veterinariya (Moscow)*, No. 7 (1976) 101-102; *C.A.*, 85 (1976) 121921q.
- 5424 Prat, J.: (Pesticide determination). *Tec. Lab.*, 49 (1976) 622-627; *C.A.*, 85 (1976) 117933c.
- 5425 Reddy, G. and Khan, M.A.Q.: Metabolism of [^{14}C]photodieldrin in house flies. *J. Agr. Food Chem.*, 25 (1977) 25-28.
- 5426 Saleh, M.A. and Casida, J.E.: Consistency of toxaphene composition analyzed by open tubular column gas-liquid chromatography. *J. Agr. Food Chem.*, 25 (1977) 63-68.
- 5427 Samosvat, L.S., Uskova, L.A. and Raskin, M.S.: (Determination of dialen in plants and grain by a thin-layer chromatographic method). *Khim. Sel'sk. Khoz.*, 14, No. 7 (1976) 76-77; *C.A.*, 85 (1976) 107554r.
- 5428 Shustrov, V.S. and Krasnykh, A.A.: (Thin-layer chromatographic determination of Morestan in water, soil and cucumbers). *Vopr. Pitani.*, No. 3 (1976) 79; *C.A.*, 85 (1976) 104729r.
- 5429 Sundström, G.: Metabolic hydroxylation of the aromatic rings of 1,1-dichloro-2,2-bis(4-chlorophenyl) ethylene (*p,p'*-DDE) by the rat. *J. Agr. Food Chem.*, 25 (1977) 18-21.
- 5430 Szalkowski, M.B. and Stallard, D.E.: Effect of pH on the hydrolysis of chlorothalonil. *J. Agr. Food Chem.*, 25 (1977) 208-210.
- 5431 Tewari, S.N. and Sharma, I.C.: Isolation and determination of chlorinated organic pesticides by thin-layer chromatography and the application to toxicological analysis. *J. Chromatogr.*, 131 (1977) 275-284 - R_F values for 12 pesticides in 26 solvent systems.
- 5432 Tsuge, S. and Mesaki, T.: (Studies of loss of carbaryl during TLC). *Noyaku Kensasho Hokoku*, 15 (1975) 112-113; *C.A.*, 85 (1976) 105156p.

- 5433 Zakrevsky, J.-G. and Mallet, V.N.: An *in situ* fluorimetric method for the detection and quantitative analysis of fenitrothion, its breakdown products and other amine-generating compounds. *J. Chromatogr.*, 132 (1977) 315-321 - amines (and nitro compounds following reduction) are reacted with fluorescamine before scanning.

See also 5250.

30. SYNTHETIC AND NATURAL DYES

- 5434 Anders, G.: Limits of accuracy obtainable in the direct determination by fluorimetry of fluorescent whitening agents on thin-layer chromatograms. *Environ. Qual. Saf., Suppl.*, 4 (1975) 104-110; *C.A.*, 85 (1976) 110078t.
- 5435 Kalinowski, D.: (Separation and identification of triphenylmethane dyes in cosmetics by thin-layer chromatography). *Roczn. Panstw. Zakl. Hig.*, 27 (1976) 403-409; *C.A.*, 85 (1976) 182253v.
- 5436 Rochat, J., Alary, J., Molinari, J. and Charriere, R.: (Physicochemical separations of xanthene dyes used as tracers in hydrology). *J. Hydrol. (Amsterdam)*, 26 (1975) 277-293; *C.A.*, 85 (1976) 98934k.
- 5437 Sharma, R.V., Mathur, S.N., Dmitrovskii, A.A., Das, R.C. and Ganguly, J.: Studies on the metabolism of β -carotene and apo- β -carotenoids in rats and chickens. *Biochim. Biophys. Acta*, 486 (1977) 183-194.
- 5438 Sievers, G. and Hynninen, P.H.: Thin-layer chromatography of chlorophylls and their derivatives on cellulose layers. *J. Chromatogr.*, 134 (1977) 359-364.
- 5439 Theidel, H.: Qualitative thin-layer chromatography of fluorescent whitening agents. *Environ. Qual. Saf., Suppl.*, 4 (1975) 94-103; *C.A.*, 85 (1976) 110077t.
- 5440 Theidel, H.: Direct determination of fluorescent whitening agents by absorption measurement *in situ* on thin-layers chromatograms. *Environ. Qual. Saf., Suppl.*, 4 (1975) 111-114; *C.A.*, 85 (1976) 110079v.
- 5441 Venkataraman, K. (Editor): *The Analytical Chemistry of Synthetic Dyes*. Wiley, Chichester, 1977, 624 pp.
- 5442 Yamada, M. and Fujimoto, M.: Preparative thin-layer chromatography of Semi-Xylenol Orange and Xylenol Orange by development with solvents giving discrete pH change on the plate. *Bull. Chem. Soc. Jap.*, 49 (1976) 693-696; *C.A.*, 85 (1976) 144681a.

31. PLASTICS AND THEIR INTERMEDIATES

- 5443 Gloeckner, G.: (Volume and concentration profiles on thin-layer plates with respect to the thin-layer chromatography fractionation of polymers). *Faserforsch. Textiltech.*, 27 (1976) 481-484; *C.A.*, 85 (1976) 143537w - a review and discussion with 26 references.
- 5444 Glöckner, G. and Kahle, D.: Dünnschichtchromatographie von Styrol-Acrylnitril-Kopolymeren. I. Gradientenelution auf Kieselgelschichten mit Toluol-Azeton-Gemischen. *Plaste Kaut.*, 23 (1976) 338-345.
- 5445 Glöckner, G. and Kahle, D.: Dünnschichtchromatographie von Styrol-Acrylnitril-Kopolymeren. II. Untersuchungen mit einer temperierbaren Sandwichkammer. *Plaste Kaut.*, 23 (1976) 577-580.
- 5447 Sopkina, A.K., Marusyak, O.V., Gordash, Yu.T. and Zhurba, A.S.: (Use of thin-layer chromatography for monitoring the condensation stages of alkylphenols with formaldehyde and amines). *Khim. Tekhnol. Topl. Masel.*, No. 5 (1976) 53-55; *C.A.*, 85 (1976) 201747c.
- 5448 Sullivan, A.B., Kuhls, G.H. and Campbell, R.H.: Determination of additives with HPLC and TLC. *Rubber Age (N.Y.)*, 108, No. 3 (1976) 41-49; *C.A.*, 85 (1976) 79357h.

See also 5235.

32. PHARMACEUTICAL AND BIOMEDICAL APPLICATIONS

32a. Synthetic drugs

- 5449 Aaroe, B.E. and Rasmussen, K.E.: The use of acid soluble adsorbents for TLC in pharmaceutical analysis. *Medd. Nor. Farm. Selsk.*, 38 (1976) 13-19; *C.A.*, 85 (1976) 130570b.
- 5450 Amin, M. and Jakobs, U.: Dünnschichtchromatographische Trennung mehrerer Wirkstoffe aus Salben und Suppositorien und ihre anschliessende direkte quantitative Analyse nach der Remissionsmethode. *J. Chromatogr.*, 131 (1977) 391-398.
- 5451 Arzamastsev, A.P., Kofman, M.D., Yaskina, D.Z. and Lirova, M.P.: (Study of some physicochemical characteristics of the quality of aceclidine and oxylidine). *Sb. Nauchn. Tr.-Tsentr. Aptechn. Nauchno-Issled. Inst.*, 13 (1975) 200-205; *C.A.*, 85 (1976) 198089g.
- 5452 Auterhofst, H. and Stanke, R.: Zur Analytik einiger Beta-Rezeptorenblocker. *Deut. Apoth. Ztg.*, 116 (1976) 1596-1597.
- 5453 De Zeeuw, R.A., Van der Laan, P.E.W., Greving, J.E. and Van Mansvelt, F.J.W.: Analysis of quaternary ammonium compounds by ion-pair thin-layer chromatography on silica gel. *Anal. Lett.*, 9 (1976) 831-838; *C.A.*, 85 (1976) 149197g.
- 5454 Ebel, S. and Herold, G.: Auswertung von Dünnschichtchromatogrammen mit internem Standard. 2. Mitt. Bestimmung von Acetylsalicylsäure durch *in situ*-Fluoreszenzmessung. *Arch. Pharm. (Weinheim)*, 308 (1975) 839-843.
- 5455 Hucker, H.B. and Stauffer, S.C.: Determination of various drugs in rodent diet mixtures. *J. Chromatogr.*, 131 (1977) 357-363.
- 5456 Koen, V. and Ruseva, N.: (Analysis of biclotyomol). *Farmatsiya (Sofia)*, 26, No. 1 (1976) 16-21; *C.A.*, 85 (1976) 198217x.
- 5457 Modras, Z.: (Study on the stability of N-carboethoxy-N-phthalazinehydrazine hydrochloride. Part II. Qualitative studies on the decomposition in aqueous solution under different storage conditions). *Farm. Pol.*, 32 (1976) 403-406; *C.A.*, 85 (1976) 149040a.
- 5458 Nin'o, N. and Kazandzhieva, P.: (Analysis of 8-hydroxyquinolines. IV. Application of thin-layer chromatography in control of the technological processes). *Farmatsiya (Sofia)*, 25, No. 4 (1975) 14-19; *C.A.*, 85 (1976) 166694j.
- 5459 Perrot, B., Michon, D., Bourgeois, G., Brachet, A. and Bertucat, M.: (Separation and identification of 18 1,4-benzo[*a*]diazepines by thin-layer chromatography). *Ankara Univ. Eczacilik. Fak. Mecm.*, 5 (1975) 82-112; *C.A.*, 85 (1976) 198225y.
- 5460 Reimers, F.: The identification of drugs. Simplified control within the pharmacy. II. Simplified thin-layer chromatography. *Arch. Pharm. Chemi, Sci. Ed.*, 4, No. 3 (1976) 45-56; *C.A.*, 85 (1976) 112796a.
- 5461 Reimers, F.: The identification of drugs. Simplified control within the pharmacy. II. Simplified thin-layer chromatography. *Arch. Pharm. Chemi*, 83 (1976) 657-668; *C.A.*, 85 (1976) 149164u - a review with 16 references.
- 5462 Ross, M.S.F.: Chromatographic analysis of azopropazone and related benzotriazines. *J. Chromatogr.*, 131 (1977) 448-452.
- 5463 Rossi, M. and Rübsamen, K.: Determination of prothionamide and its sulphoxide metabolite in physiological fluids by quantitative thin-layer chromatography. *J. Chromatogr.*, 132 (1977) 562-565.
- 5464 Sarsúnová, M., Kakáč, B. and Semonský, M.: (The detection of purine carcinostatics, some metabolites and products of their possible degradation by thin-layer chromatography). *Ceskoslov. Farm.*, 26 (1977) 19-21.

32b. Metabolism of drugs, toxicological applications

- 5465 Frigerio, A., Lanzoni, J., Pantarotto, C., Rossi, E., Rovei, V. and Zanol, M.: Epoxide-diol metabolic pathway of cystenamide in the rat. *J. Chromatogr.*, 134 (1977) 299-305.
- 5466 Giebelmann, R., Nagel, S., Brunstein, C. and Scheibe, E.: (Thin-layer chromatographic determination of quaternary ammonium compounds of toxicological-chemical relevance). *Zentralbl. Pharm. Pharmakother. Laboratoriumsdiagn.*, 115 (1976) 339-346; *C.A.*, 85 (1976) 88113c.
- 5467 Giebelmann, R.: (Systematization of thin-layer chromatographic methods for the identification of low-volatile organic substances with chemical-toxicological relevance). *Zentralbl. Pharm. Pharmakother. Laboratoriumsdiagn.*, 115 (1976) 485-490; *C.A.*, 85 (1976) 137072z.

- 5468 Giebelmann, R.: (Two-dimensional thin-layer chromatographic separation of quaternary and other ammonium compounds of chemical-toxicological relevance). *Zentralbl. Pharm., Pharmakother. Laboratoriumsdiagn.*, 115 (1976) 491-497; *C.A.*, 85 (1976) 137073a.
- 5469 Gupta, R.N., Eng, F. and Keane, P.M.: Thin-layer chromatographic method for the quantitative analysis of paracetamol (N-acetyl-p-aminophenol) in blood plasma. *J. Chromatogr.*, 143 (1977) 112-114.
- 5470 Kaistha, K.K. and Tadrus, R.: Thin-layer chromatographic detection of quinine, morphine and poly-drugs. *Clin. Chem.*, 22 (1976) 1936-1937.
- 5471 Kiss, E. and Karolowska, K.: (Determination of certain new preservatives in cosmetics by thin-layer and gas chromatography). *Roczn. Panstw. Zakl. Hig.*, 27 (1976) 419-426; *C.A.*, 85 (1976) 182254w.
- 5472 Machata, G.: (Routine determination of drugs in urine analyses). *Oesterr. Apoth.-Ztg.*, 30 (1976) 822-824; *C.A.*, 85 (1976) 186417z.
- 5473 Pitre, D.: Radiopaque contrast media. XL. Isolation and identification of the metabolites of iopronic acid in the urine and bile of the dog. *Farmaco, Ed. Prat.*, 31 (1976) 516-528.
- 5474 Pitre, D. and Felder, E.: Radiopaque contrast media. XLII. Metabolism of iopronic acid in human. *Farmaco, Ed. Prat.*, 31 (1976) 540-546.
- 5475 Pitre, D. and Fumagalli, L.: Radiopaque contrast media. XLI. Isolation and identification of the metabolites of iopronic acid in the rat. *Farmaco, Ed. Prat.*, 31 (1976) 529-539.
- 5476 Koerig, D.L., Wang, R.I.H., Mueller, M.M., Lewand, D.L. and Adams, S.M.: Radioimmunoassay compared to thin-layer and gas-liquid chromatography for detecting methadone in human urine. *Clin. Chem.*, 22 (1976) 1915-1918.
- 5477 Sheehan, M. and Haythorn, P.: Combined thin-layer and gas-liquid chromatographic identification of tricyclic antidepressants in urine. *J. Chromatogr.*, 132 (1977) 237-247 - R_F values for 41 compounds (antidepressants, alkaloids and metabolites).
- 5478 Steyn, J.M.: Thin-layer chromatographic determination of mafenide [(*p*-amino-methyl)benzene-sulphonamide] in human serum. *J. Chromatogr.*, 143 (1977) 210-213.
- 5479 Van Boven, M. and Daenens, P.: Combined gas-liquid chromatographic-mass spectrometric analysis of pemoline in biological samples. *J. Chromatogr.*, 134 (1977) 415-421.
- 5480 Vinson, J.A., Patel, D.D. and Patel, A.H.: Detection of tetrahydrocannabinol in blood and serum using a fluorescent derivative and thin-layer chromatography. *Anal. Chem.*, 49 (1977) 163-165.
- 5481 Wad, N.T. and Hanifl, E.J.: Simplified thin-layer chromatographic method for the simultaneous determination of clonazepam, diazepam and their metabolites in serum. *J. Chromatogr.*, 143 (1977) 214-218.
- 5482 Wad, N., Hanifl, E. and Rosenmund, H.: Rapid thin-layer chromatographic method for the simultaneous determination of carbamazepine, diphenylhydantoin, mephenytoin, phenobarbital and primidone in serum. *J. Chromatogr.*, 143 (1977) 89-93.

32c. Plant extracts

See 5264.

32d. Biomedical applications

See 5283, 5285, 5290, 5306, 5322, 5342, 5343, 5345.

33. INORGANIC SUBSTANCES

- 5483 Gabakyan, D.S., Egikyan, R.T. and Mkhitarian, L.F.: (Study of the behaviour and separation of selenium(4+), tellurium(4+) and gold(3+) ions by chromatography and electrochromatography in thin layers of supports). *Uch. Zap. Erevan. Un-t. Estestv. N.*, No. 2 (1975) 99-103; *C.A.*, 85 (1976) 136615s.
- 5484 Hanai, L.W., Zuanon Netto, J. and Longo, A.: (Separation of lead(II), calcium (II), aluminium(III), copper(II) and zinc(II) ions from iron(III) ions by cellulose thin-layer chromatography). *Rev. Fac. Farm. Odontol. Araraquara*, 8 (1974) 145-149; *C.A.*, 85 (1976) 116039d.

- 5485 Rafizadeh, M. and Specker, H.: (Thin-layer chromatographic separations of all rare earths with only one solvent system). *Naturwissenschaften*, 63 (1976) 483-484; *C.A.*, 85 (1976) 201532d.
- 5486 Sheinina, R.I., Khalimova, U.Kh. and Begmatova, M.P.: (Determination of residual quantities of magnesium chloride in cotton seeds, their pods and the cotton oil cake). *Khim. Sel'sk. Khoz.*, 14, No. 8 (1976) 66-67; *C.A.*, 85 (1976) 138116d.
- 5487 Thielemann, H.: (Thin-layer chromatographic separation, identification and determination limits as well as the semiquantitative determination of halide ions on activated, commercially available films). *Z. Chem.*, 16 (1976) 283; *C.A.*, 85 (1976) 136620q.
- 5488 Turina, N. and Turina, S.: Trace analysis of lead in oil by TLC. *Chromatographia*, 10 (1977) 97-99.
- 5489 Upadhyay, R.K. and Bansal, R.R.: Thin-layer chromatography of metal ions complexed with anils: Part I. *J. Indian Chem. Soc.*, 53 (1976) 15-16; *C.A.*, 85 (1976) 103274b.
- 5490 Upadhyay, R.K. and Singh, V.P.: Thin-layer chromatography of metal ions complexed with anils. Part II. *J. Indian Chem. Soc.*, 52 (1975) 1164-1166; *C.A.*, 85 (1976) 153387m.

See also 5252.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 5491 Heck, H.d'A., Simon, R.L. and Anbar, M.: Isotopic fractionation in thin-layer chromatography. *J. Chromatogr.*, 133 (1977) 281-290 - lower mobility of N-methyl deuterated imipramine on silica gel and alumina is attributed to its higher basicity.
- 5492 Nowak, K. and Pasternak, A.: (Separation of hydration isomers of chromium-51 trichloride hexahydrate by thin-layer chromatography and its application to the investigation of isomeric transitions occurring in the titration of these isomers with a base). *J. Radioanal. Chem.*, 31 (1976) 167-176; *C.A.*, 85 (1976) 153184t.
- 5493 Zuleski, F.R., Loh, A. and Di Carlo, F.J.: Assay of human plasma for nortriptyline by radioacetylation and thin-layer chromatography. *J. Chromatogr.*, 132 (1977) 45-49.

35. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

35a. Surfactants

- 5494 Hess, H. and Schoenmann, H.: (Thin-layer chromatographic determination of preservative materials in gelatin. I. Detection of Tego surfactants). *Bioch. Lebensm. Rundsch.*, 72 (1976) 270-273; *C.A.*, 85 (1976) 121915r.

Electrophoretic Techniques

1. REVIEWS AND BOOKS

- 5496 Arbuthnott, J.P. and Beeley, J.A. (Editors): *Isoelectric Focusing*. Butterworths, London, 1975, XI + 367 pp.

2. FUNDAMENTALS, THEORY AND GENERAL

2b. Measurement of physicochemical and related values

- 5497 Weiss, G.H. and Rodbard, D.: Measures of resolution for multicomponent systems in one and two dimensions with application to pore gradient electrophoresis. *Separ. Sci.*, 11 (1976) 347-359.

3. TECHNIQUES I

3a. Detection and quantitative analysis

- 5498 Hofmann, K. and Blüchel, E.: Aufbewahrung und Densitometrie von Elektrophorese-Gelpflatten in evakuierten durchsichtigen Beuteln. *J. Chromatogr.*, 130 (1977) 444-445.

3c. Electrophoresis in stabilized media

- 5499 Ernst, W. and Niedner, R.: A simple apparatus for preparative polyacrylamide gel electrophoresis. *J. Chromatogr.*, 130 (1977) 331-335 - polyacrylamide gel.
- 5500 Ewart, J.A.D.: Apparatus for slab polyacrylamide gel electrophoresis. *J. Appl. Chem. Biotechnol.*, 26 (1976) 239-246; *C.A.*, 85 (1976) 131086k - polyacrylamide gel.
- 5501 Hannig, K. and Wirth, H.: Apparatus and method for deflection electrophoresis. *Ger. Offen. Pat.* 2,508,844 (Cl.C25X), 09 Sep. 1976, Appl., 28 Feb. 1975, 20 pp.; *C.A.*, 85 (1976) 173865u.
- 5502 Hoefer, S.A.: Vertical gel slab electrophoresis apparatus and method. *U.S. Pat.* 3,980,540 (Cl.204-180G; GO1N27/26), 14 Sep. 1976. Appl. 455,871, 28 Mar. 1975, 8 pp.; *C.A.*, 85 (1976) 173866v.
- 5503 Horowitz, P.M.: A facile system for processing polyacrylamide disc gels following electrophoresis. *J. Chem. Educ.*, 53 (1976) 644.
- 5504 Israel, L. and Bernstein, L.: Continuous preparative electrophoresis apparatus. *U.S. Pat.* 3,956,099 (1976); *C.A.*, 86 (1977) 18837p.

3d. Isoelectric focusing

- 5505 Brown, R.K., Caspers, M.L., Lull, J.M., Vinogradov, S.N., Felgenhauer, K. and Nekic, M.: Carrier ampholyte distribution in isoelectric focusing. *J. Chromatogr.*, 131 (1977) 223-232.
- 5506 Gelsema, W.J. and De Ligny, C.L.: Isoelectric focusing as a method for the characterization of ampholytes. *J. Chromatogr.*, 130 (1977) 41-50.
- 5507 Papeschi, G., Bordi, S., Beni, C. and Ventura, L.: Use of an iridium electrode for direct measurement of *pI* of proteins after isoelectric focusing in polyacrylamide gel. *Biochim. Biophys. Acta*, 453 (1976) 192-199 - isoelectric focusing.
- 5508 Rüchel, R.: Two-dimensional micro-separation technique for proteins and peptides, combining isoelectric focusing and gel gradient electrophoresis. *J. Chromatogr.*, 132 (1977) 451-468.

See also 5538, 5546, 5562, 5582, 5586, 5590, 5591, 5600, 5624, 5636, 5651, 5654, 5655, 5661, 5672, 5677, 5680, 5683, 5684, 5686, 5692, 5695-5697, 5701, 5703, 5705, 5708-5712, 5717, 5722, 5726, 5728, 5730, 5734, 5735, 5737, 5739, 5746, 5751, 5755.

3e. Isotachophoresis

- 5509 Bier, M., Cuddeback, R.M. and Kopwillem, A.: Preparative plasma protein fractionation by isotachophoresis in Sephadex columns. *J. Chromatogr.*, 132 (1977) 437-450.
- 5510 Sollenberg, J. and Baldesten, A.: Isotachophoretic analysis of mandelic acid, phenylglyoxylic acid, hippuric acid and methylhippuric acid in urine after occupational exposure to styrene, toluene and/or xylene. *J. Chromatogr.*, 132 (1977) 469-476.

- 5511 Uyttendaele, K., Groote, M.D., Blaton, V., Peeters, H. and Alexander, F.: Analysis of the proteins in sweat and urine by agarose-gel isotachophoresis. *J. Chromatogr.*, 132 (1977) 261-266.
- 5512 Verheggen, T.P.E.M., Mikkers, F.E.P. and Everaerts, F.M.: Isotachophoresis in narrow-bore tubes. *J. Chromatogr.*, 132 (1977) 205-215.

See also 5595.

10. CARBOHYDRATES

10a. Mono- and oligosaccharides; structural studies

- 5513 Schultz, J.C. and Takayama, K.: Enzymatic synthesis of 2-O- α -D-mannopyranosyl- β -methyl- α -D-mannopyranoside by a cell-free particulate system of *Mycobacterium smegmatis*. *Biochim. Biophys. Acta*, 428 (1976) 563-572 - paper.
- 5514 Yamashita, K., Tachibana, Y. and Kobata, A.: Oligosaccharides of human milk, isolation and characterization of three new disialylfucosyl hexasaccharides. *Arch. Biochem. Biophys.*, 174 (1976) 582-591 - paper.

10b. Polysaccharides, mucopolysaccharides and lipopolysaccharides

- 5515 Arai, H. and Sato, Y.: Separation and characterization of two distinct hemagglutinins contained in purified leukocytosis-promoting factor from *Bordetella pertussis*. *Biochim. Biophys. Acta*, 444 (1976) 765-782 - SDS-polyacrylamide gel.
- 5516 Baig, M.M. and Ayoub, E.M.: Purification and chemical characterization of salt-extractable glycoproteins from porcine mitral valve. *Biochemistry*, 15 (1976) 2585-2590 - polyacrylamide gel.
- 5517 Clementson, K.J., Pfueller, S.L., Luscher, E.F. and Jenkins, C.S.P.: Isolation of the membrane glycoproteins of human blood platelets by lectin affinity chromatography. *Biochim. Biophys. Acta*, 464 (1977) 493-508 - SDS-polyacrylamide gel.
- 5518 Dietrich, C.P., McDuffie, N.M. and Sampaio, L.O.: Identification of acidic mucopolysaccharides by agarose gel electrophoresis. *J. Chromatogr.*, 130 (1974) 299-304 - agarose gel.
- 5519 Dimitriev, B.A., Lvov, V.L., Kochetkov, N.K., Jann, B. and Jann, K.: Cell-wall lipopolysaccharide of the "Shigella-like" *Escherichia coli* 0124. Structure of the polysaccharide chain. *Eur. J. Biochem.*, 64 (1976) 491-498 - SDS-polyacrylamide gel.
- 5520 Fengel, D.: (Fractionation experiments with the alkali extract from spruce holocellulose. Part 1. Electrophoresis, gel chromatography and ion-exchange chromatography). *Holzforschung*, 30 (1976) 73-78; *C.A.*, 85 (1976) 48497z.
- 5521 Hagen, I., Olsen, T. and Solum, N.O.: Studies on subcellular fractions of human platelets by the lactoperoxidase-iodination technique. *Biochim. Biophys. Acta*, 455 (1976) 214-225 - SDS-polyacrylamide gel.
- 5522 Iuchi, I. and Yamagami, K.: Major glycoproteins solubilized from the teleostean egg membrane by the action of the hatching enzyme. *Biochim. Biophys. Acta*, 453 (1976) 240-249 - polyacrylamide gel.
- 5523 Kitamura, K., Suzuki, M. and Uyemura, K.: Purification and partial characterization of two glycoproteins in bovine peripheral nerve myelin membrane. *Biochim. Biophys. Acta*, 455 (1976) 806-816 - SDS-polyacrylamide gel.
- 5524 Klagsbrun, M.: The decreased synthesis of chondroitin sulfate-containing extracellular proteoglycans by SV 40 transformed Balb/c 3T3 cells. *Biochim. Biophys. Acta*, 451 (1976) 170-183 - SDS-polyacrylamide gel.
- 5525 Krantz, M.J., Lee, Y.C. and Hung, P.P.: Characterization and comparison of the major glycoprotein from three strains of rous sarcoma virus. *Arch. Biochem. Biophys.*, 174 (1976) 66-73 - polyacrylamide gel.
- 5526 Newman, R.A., Harrison, R. and Uhlenbruck, G.: Alkali-labile oligosaccharides from bovine milk fat globule membrane glycoprotein. *Biochim. Biophys. Acta*, 433 (1976) 344-356 - SDS-polyacrylamide gel.
- 5527 Ogano, A., Ogashiwa, T. and Nagasawa, K.: Purification and properties of blood group A-active glycoprotein from oyster viscera. *Biochim. Biophys. Acta*, 451 (1976) 426-435 - SDS-polyacrylamide gel, cellulose acetate.

- 5528 Partridge, J., Shannon, L. and Gumpf, D.: A barley lectin that binds free amino sugars. I. Purification and characterization. *Biochim. Biophys. Acta*, 451 (1976) 470-483 - isoelectric focusing, cellulose acetate, polyacrylamide gel, SDS-polyacrylamide gel.
- 5529 Randoux, A., Cornillet-Stoupy, J., Desanti, M. and Borel, J.P.: Isolement et caractérisation de deux subunités constitutives des glycoprotéines de structure du tissu sous cutané de lapin. *Biochim. Biophys. Acta*, 446 (1976) 77-86 - agarose gel.
- 5530 Waechter, C.J., Kennedy, J.L. and Harford, J.B.: Lipid intermediates involved in the assembly of membrane-associated glycoproteins in calf brain white matter. *Arch. Biochem. Biophys.*, 174 (1976) 726-737 - Whatman No. 3MM paper, SG-81 paper, SDS-polyacrylamide gel.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

- 5531 Thompson, W. and Macdonald, G.: Cytidine diphosphate diglyceride of bovine brain. Positional distribution of fatty acids and analysis of major molecular species. *Eur. J. Biochem.*, 65 (1976) 107-111 - Whatman No. 1 paper.

See also 5510.

11b. Lipids and their constituents

- 5532 Clarke, J.T.R., Stoltz, J.M. and Mulcahey, M.R.: Neutral glycosphingolipids of serum lipoproteins in Fabry's disease. *Biochim. Biophys. Acta*, 431 (1976) 317-325 - agarose gel.
- 5533 Van den Bergh, F.A.J.T.M. and Tager, J.M.: Localization of neutral glycosphingolipids in human plasma. *Biochim. Biophys. Acta*, 441 (1976) 391-402 - immuno-electrophoresis.

11c. Lipoproteins

- 5534 Aiyappa, P.S. and Lampen, J.O.: Membrane associated phospholipoproteins of *Bacillus licheniformis* 749. *Biochim. Biophys. Acta*, 448 (1976) 401-410 - SDS-polyacrylamide gel.
- 5535 Chino, H., Yamagata, M. and Takahashi, K.: Isolation and characterization of insect vitellogenin. Its identity with hemolymph lipoprotein II. *Biochim. Biophys. Acta*, 441 (1976) 349-353 - polyacrylamide gel.
- 5536 Desreumaux, C., Fruchart, J.C., DeWailly, P., Jaklard, J. and Sezille, G.: Fractionation of serum lipoproteins by preparative electrophoresis in polyacrylamide gel. *J. Chromatogr.*, 130 (1977) 336-341 - polyacrylamide gel.
- 5537 Kamysznikov, V.S., Kolb, V.G., Volod'ko, A.A., Kamenkov, V.P. and Voitovich, G.A.: (Quantitative evaluation of disc electropherograms of blood serum lipoproteins). *Zdravookhr. Beloruss.*, (1976) 23-25; *C.A.*, 85 (1976) 173670b.
- 5538 Lutton, C. and Zilversmit, D.B.: A new rat liver phospholipid exchange protein. *Biochim. Biophys. Acta*, 441 (1976) 370-379 - isoelectric focusing, SDS-polyacrylamide gel.
- 5539 Muckle, T.J.: A third form of electrophoretic dye-induced mobility alteration (DIMA): polymorphism of α_1 lipoprotein as revealed by immuno-electrophoresis with thymol blue. *Clin. Chim. Acta*, 73 (1976) 57-61; *C.A.*, 86 (1977) 27399z.
- 5540 Raju, K.S. and Mahadevan, S.: Protein components in the very low density lipoproteins of hen's egg yolks. Identification of highly aggregating (gelling) and less aggregating (non-gelling) proteins. *Biochim. Biophys. Acta*, 446 (1976) 387-398 - SDS-polyacrylamide gel.
- 5541 Storozhev, A.L.: (Improved polyacrylamide-gel-disc-electrophoresis method for separating blood plasma lipoproteins). *Tr. Kazan. Med. Inst.*, (1975) 68-70; *C.A.*, 86 (1977) 27395v.

18. AMINO ACIDS

See 5510.

19. PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

19a. Peptides (including peptidic and proteinous hormones)

- 5542 Babich, P.A., Aslanova, T.A. and Nurgalleva, L.I.: (Method for the quantitative determination of the purity and activity of crystalline insulin using polyacrylamide gel electrophoresis). *Khim.-Pharm. Zh.*, 10 (1976) 141-143; *C.A.*, 85 (1976) 130574f.
- 5543 Gráf, L., Barát, E., Borvendég, J., Hermann, I. and Patthy, A.: Action of thrombin on ovine, bovine and human pituitary growth hormones. *Eur. J. Biochem.*, 64 (1976) 333-340 - SDS-polyacrylamide gel.
- 5544 Martynenko, F.P. and Sakhno, T.A.: (Separation of adenohypophysis hormones by dodecyl-sulfate-polyacrylamide gel electrophoresis). *Ukr. Biokhim. Zh.*, 48 (1976) 653-655; *C.A.*, 85 (1976) 173669h.
- 5545 Taylor, D.G. and Crawford, N.: Enzymatic and chemical analyses of pig platelet membrane subfractions isolated by zonal centrifugation. *Biochim. Biophys. Acta*, 436 (1976) 77-94 - SDS-polyacrylamide gel.

19b. Elucidation of structure of proteins

- 5546 Beaudet, R. and Mackenzie, R.E.: Formiminotransferase cyclodeaminase from porcine liver. An octomeric enzyme containing bifunctional polypeptides. *Biochim. Biophys. Acta*, 453 (1976) 151-161 - SDS-polyacrylamide gel, isoelectric focusing.
- 5547 Bhan, A.K. and Malhorta, A.: Trypsin digestion of canine cardiac myosin. Low molecular weight fragment of myosin with high adenosine triphosphate activity. *Arch. Biochem. Biophys.*, 174 (1976) 27-35 - SDS-polyacrylamide gel.
- 5548 Brouwer, M., Wolters, M. and Van Bruggen, E.F.J.: Proteolytic fragmentation of *Helix pomatia* α -hemocyanin: structural domains in the polypeptide chain. *Biochemistry*, 15 (1976) 2618-2623 - SDS-polyacrylamide gel.
- 5549 Dobrovolsky, A.B. and Gusev, N.B.: (Study of the reactivities of sulphydryl groups of troponin). *Biokhimiya*, 41 (1976) 994-999 - polyacrylamide gel.
- 5550 Drabikowski, W., Grabarek, Z. and Barylko, B.: Degradation of TN-C component of troponin by trypsin. *Biochim. Biophys. Acta*, 490 (1977) 216-224 - polyacrylamide gel, SDS-polyacrylamide gel.
- 5551 Kramer, K.J., Dunn, P.E., Peterson, R.C., Seballos, H.L., Sanburg, L.L. and Law, J.H.: Purification and characterization of the carrier protein for juvenile hormone from the hemolymph of the tobacco hornworm *Manduca sexta* Johansson (*Lepidoptera: Sphingidae*). *J. Biol. Chem.*, 251 (1976) 4979-4985 - polyacrylamide gel, isoelectric focusing.
- 5552 Owen, M.C., Carrell, R.W. and Brennan, S.O.: The abnormality of the S variant of human α -1-antitrypsin. *Biochim. Biophys. Acta*, 453 (1976) 257-261 - paper.
- 5553 Rasulov, A.S., Evstigneyeva, Z.G., Kretovich, W.L., Stelmeschuk, V.Ya., Samsonidze, T.G. and Kiselev, N.A.: (Purification, properties and quaternary structure of glutamine synthetase from *Chlorella*). *Biokhimiya*, 42 (1977) 350-358 - SDS-polyacrylamide gel.
- 5554 Riley, D.E. and Keller, J.M.: The polypeptide composition and ultrastructure of nuclear ghosts isolated mammalian cells. *Biochim. Biophys. Acta*, 444 (1976) 899-911 - SDS-polyacrylamide gel.
- 5555 Sasaki, R., Utsumi, S., Sugimoto, E. and Chiba, H.: Subunit structure and multifunctional properties of yeast phosphoglyceromutase. *Eur. J. Biochem.*, 66 (1976) 523-533 - polyacrylamide gel.
- 5556 Shelton, K.R.: Selective effects of nonionic detergent and salt solutions in dissolving nuclear envelope protein. *Biochim. Biophys. Acta*, 455 (1976) 973-982 - SDS-polyacrylamide gel.
- 5557 Sjödahl, J.: Repetitive sequences in protein A from *Staphylococcus aureus*. Arrangement of five regions within the protein, four being highly homologous and Fc-binding. *Eur. J. Biochem.*, 73 (1977) 343-351 - polyacrylamide gel.

- 5558 Sobieszek, A.: Ca-linked phosphorylation of a light chain of vertebrate smooth-muscle myosin. *Eur. J. Biochem.*, 73 (1977) 477-483 - SDS-polyacrylamide gel.
- 5559 Staples, S.J. and Reithel, F.J.: Evidence for an active-inactive subunit complex in jack bean urease. *Arch. Biochem. Biophys.*, 174 (1976) 651-657 - SDS-polyacrylamide gel.
- 5560 Telecki, M., Fabian, F., El-Sewedy, S.M. and Straub, B.F.: Microheterogeneity in porcine pancreatic amylase preparations due to disulfide-sulfhydryl exchange. *Biochim. Biophys. Acta*, 429 (1976) 860-869 - peptide mapping.
- 5561 Thompson, A.R., Enfield, D.L., Ericsson, L.H., Legaz, M.E. and Fenton, J.W., II: Human thrombin: partial primary structure. *Arch. Biochem. Biophys.*, 178 (1977) 356-367 - polyacrylamide gel.
- 5562 Van Kleef, F.S.M., Willems-Thijssen, W. and Hoenders, H.J.: Intracellular degradation and deamidation of α -crystallin subunits. *Eur. J. Biochem.*, 66 (1976) 477-483 - SDS-polyacrylamide gel, isoelectric focusing.
- 5563 Yamashiro, D. and Li, C.H.: Isolation and properties of ovine [l -pyroglutamic acid]- β -lipoprotein. *Biochim. Biophys. Acta*, 451 (1976) 124-132 - paper.

20. PROTEINS INCLUDING ENZYMES

- 5564 Al-Jumaily, W., Wyler, J. and Duncan, B.: A comparative densitometric analysis of protein staining reagents for their staining efficiency of proteins separated by polyacrylamide gel-disc electrophoresis. *Bios*, 47 (1976) 124-131; *C.A.*, 86 (1977) 13407p.
- 5565 Starchenkov, E.P. and Zhelyuk, V.M.: (Equipment for protein electrophoresis in polyacrylamide gel under anaerobic conditions). *Prikl. Biokhim. Mikrobiol.*, 12 (1976) 795-797; *C.A.*, 86 (1977) 13380z.
- 5566 Takagi, T., Shirahama, K., Tsujii, K. and Kubo, K.: (Complex formed between sodium dodecyl sulfate and protein polypeptide with special reference to SDS-polyacrylamide gel electrophoresis). *Tampakushitsu Kakusan Koso*, 21 (1976) 811-829; *C.A.*, 86 (1977) 12721z.

See also 5507-5509.

20a. Proteins of plant origin including bacteria

- 5567 Ballivet, M., Reichardt, L.F. and Eisen, H.: Purification and properties of coliphage 21 represor. *Eur. J. Biochem.*, 73 (1977) 601-606 - SDS-polyacrylamide gel.
- 5568 Belew, M.: The trypsin and chymotrypsin inhibitors in chick peas (*Cicer arietinum* L.). The relationships among the six isoinhibitors. *Eur. J. Biochem.*, 73 (1977) 411-420 - polyacrylamide gel.
- 5569 De Graaf, F.K. and Klaasen-Boor, P.: Purification and characterization of a complex between cloacin and its immunity protein isolated from *Enterobacter cloacae* (Clo DF13). Dissociation and reconstitution of the complex. *Eur. J. Biochem.*, 73 (1977) 107-114 - SDS-polyacrylamide gel.
- 5570 Falkenberg, P., Matheson, A.T. and Rollin, C.F.: The properties of ribosomal proteins from a moderate halophile. *Biochim. Biophys. Acta*, 434 (1976) 474-482 - polyacrylamide gel.
- 5571 Fenzl, F., Decker, M., Haass, D. and Tanner, W.: Characterization and partial purification of an inducible protein related to hexose proton cotransport of *Chlorella vulgaris*. *Eur. J. Biochem.*, 42 (1977) 509-514 - SDS-polyacrylamide gel.
- 5572 Gast, W.H. and Leberman, R.: Release of certain ribosomal proteins from 70-S *Escherichia coli* ribosomes by mild ribonuclease digestion. *Biochim. Biophys. Acta*, 432 (1976) 98-103 - SDS-polyacrylamide gel, 2-dimensional gel electrophoresis.
- 5573 Gorelic, L.: Analysis of the kinetics of photoinduced crosslinkage of the protein and RNA components of the *Escherichia coli* 50 S ribosomal subunit. *Biochim. Biophys. Acta*, 454 (1976) 185-192 - polyacrylamide gel, 2-dimensional electrophoresis.

- 5574 Jiménez, F., Camacho, A., De la Torre, J., Vinuela, E. and Salas, M.: Assembly of *Bacillus subtilis* phage ϕ 29. 2. Mutants in the cistrons coding for the non-structural proteins. *Eur. J. Biochem.*, 73 (1977) 57-72 - polyacrylamide gel.
- 5575 Kamio, Y. and Nikaido, H.: Outer membrane of *Salmonella typhimurium*. Identification of proteins exposed on cell surface. *Biochim. Biophys. Acta*, 464 (1977) 589-601 - SDS-polyacrylamide gel.
- 5576 Klimenko, V.G. and Tyurina, Zh.P.: (Study of total protein and albumin fractions of sunflower seeds by chromatography on different supports and by electrophoresis). *Izv. Akad. Nauk. Mold. SSR, Ser. Biol. Khim. Nauk.*, (1976) 15-25; C.A., 86 (1977) 27370h.
- 5577 Kushwaha, S.C., Kates, M. and Stoeckenius, W.: Comparison of purple membrane from *Halobacterium cutirubrum* and *Halobacterium halobium*. *Biochim. Biophys. Acta*, 426 (1976) 703-710 - peptide mapping, SDS-polyacrylamide gel.
- 5578 Leighton, T., Leighton, F., Dill, B. and Stock, J.: The similarities of ribosomal and basic chromosomal proteins from fungi. *Biochim. Biophys. Acta*, 432 (1976) 381-394 - acidic urea-polyacrylamide gel, SDS-polyacrylamide gel.
- 5579 Olson, J.M., Giddings, T.H., Jr. and Shaw, E.K.: An enriched reaction center preparation from green photosynthetic bacteria. *Biochim. Biophys. Acta*, 449 (1976) 197-208 - polyacrylamide gel.
- 5580 Reithmeier, R.A.F. and Bragg, P.D.: Molecular characterization of a heat-modifiable protein from the outer membrane of *Escherichia coli*. *Arch. Biochem. Biophys.*, 178 (1977) 527-534 - SDS-polyacrylamide gel.
- 5581 Rottem, S., Hardegree, M.C., Grabowski, M.W., Fornwald, R. and Barile, M.F.: Interaction between tetanolysin and mycoplasma cell membrane. *Biochim. Biophys. Acta*, 455 (1976) 876-888 - SDS-polyacrylamide gel.

20b. Plasma proteins

- 5582 Bhakdi, S., Bjerrum, O.J. and Knüfermann, H.: The major "intrinsic" membrane protein of human erythrocytes. Preparative isolation and immunoelectrophoretic analyses. *Biochim. Biophys. Acta*, 446 (1976) 419-431 - isoelectric focusing, SDS-polyacrylamide gel, crossed immunoelectrophoresis.
- 5583 Bjerrum, O.J. and Bøg-Hansen, T.C.: The immunochemical approach to the characterization of membrane proteins. Human erythrocyte membrane proteins analysed as a model system. *Biochim. Biophys. Acta*, 455 (1976) 66-89 - crossed immunoelectrophoresis.
- 5584 Burr, W.A. and Ramsden, D.B.: Improved rapid immunoelectrophoretic assay of human serum thyroxine binding globulin. *J. Chromatogr.*, 143 (1977) 109-111.
- 5585 Caldwell, A.B.: Proteins of the turkey erythrocyte membrane. *Biochemistry*, 15 (1976) 2711-2718 - polyacrylamide gel.
- 5586 Dubin, A.: A polyvalent-proteinase inhibitor from horse-blood-leucocyte cytosol. Isolation, purification and some molecular parameters. *Eur. J. Biochem.*, 73 (1977) 429-435 - SDS-polyacrylamide gel, isoelectric focusing.
- 5587 Dzhumkov, V.A. and Pleshkevich, I.S.: (Unified procedures for the simultaneous determination of hereditary types of polymorphous systems of blood proteins in cattle). *Selskokh. Biol.*, 11 (1976) 770-771; C.A., 86 (1977) 13390c.
- 5588 Gavrilova, E.M., Egorov, A.M. and Shakhannina, K.L.: (Isolation and immunochemical study of monomer and dimer forms of IgA human globulins). *Biokhimiya*, 41 (1976) 684-691 - immunoelectrophoresis, polyacrylamide gel.
- 5589 Groc, W. and Lahn, W.: Investigation of the apparent delay in mobility of albumin, α -1-antitrypsin, haptoglobin 1-1 and fibrinogen in electroimmunodiffusion. *J. Immunol. Methods*, 12 (1976) 227-236; C.A., 86 (1977) 28357w.
- 5590 Huntley, T.E., Neitzel, J.K. and Elson, M.K.: Binding properties of purified adult and fetal bovine serum albumin. *Biochim. Biophys. Acta*, 490 (1977) 112-119 - cellulose acetate, isoelectric focusing, polyacrylamide gel.
- 5591 Jones, R.E.: The selective uptake and transmission of proteins to the circulation from the small intestine of the suckling rat. *Biochim. Biophys. Acta*, 451 (1976) 151-160 - isoelectric focusing.
- 5592 Lepke, S. and Passow, H.: Effects of incorporated trypsin on anion exchange and membrane proteins in human red blood cell ghosts. *Biochim. Biophys. Acta*, 455 (1976) 353-370 - SDS-polyacrylamide gel.
- 5593 Ludany, A. and Kellermayer, M.: Two-dimensional polyacrylamide gel electrophoretic separation of human serum proteins. *Proc. Hung. Annu. Meet. Biochem.*, 18th, (1976) 165-166; C.A., 86 (1977) 13379f.

- 5594 Nilsson, S.F. and Waxdal, M.J.: Isolation and identification of the major concanavalin A binding glycoproteins from murine lymphocytes. *Biochemistry*, 15 (1976) 2698-2705 - SDS-polyacrylamide gel.
- 5595 Prowse, C.V., Mattock, P., Esnouf, M.P. and Russel, A.M.: A variant of prothrombin induced in cattle by prolonged administration of Warfarin. *Biochim. Biophys. Acta*, 434 (1976) 265-279 - SDS-polyacrylamide gel, agarose gel, preparative isotachophoresis.
- 5596 Radcliffe, R. and Nemerson, Y.: Mechanism of activation of bovine factor VII. Products of cleavage by factor X. *J. Biol. Chem.*, 251 (1976) 4797-4802 - paper, polyacrylamide gel.
- 5597 Sas, G., Pepper, D.S. and Cash, J.D.: ("Crossed" immunoelectrophoresis with heparin: A new method for testing for antithrombin III). *Kiserl. Orvostud.*, 28 (1976) 344-347; *C.A.*, 86 (1977) 27192b.
- 5598 Swaney, J.B. and Kuehl, K.S.: Separation of apolipoproteins by an acrylamide-gradient sodium dodecyl sulfate gel electrophoresis system. *Biochim. Biophys. Acta*, 446 (1976) 561-565 - SDS-polyacrylamide gradient electrophoresis.
- 5599 Tewksbury, D.A., Premesu, M.R. and Dumas, M.L.: Isolation of human angiotensinogen. *Biochim. Biophys. Acta*, 446 (1976) 87-95 - polyacrylamide gel, immunoelectrophoresis.
- 5600 Törmä, E.T. and Paucker, K.: Purification and characterization of human leukocyte interferon components. *J. Biol. Chem.*, 251 (1976) 4810-4816 - polyacrylamide gel, isoelectric focusing.
- 5601 Uzgiris, E.E.: Electrophoretic method of detecting antigen-antibody reaction. *U.S. Pat.* 3,984,533 (Cl. 424-12; GOIN 27/26), 05 Oct. 1976, Appl. 631,727, 13 Nov. 1975, 5 pp.; *C.A.*, 85 (1976) 173872u.

20c. Structural and muscle proteins

- 5602 Bailin, G.: Myosin and actomyosin from human skeletal muscle. *Biochim. Biophys. Acta*, 449 (1976) 310-326 - SDS-polyacrylamide gel.
- 5603 Bailin, G., Shen, M.-J. and Katz, A.M.: Cooperative interactions between the contractile proteins of cardiac and skeletal muscle. *Biochim. Biophys. Acta*, 480 (1977) 469-478 - SDS-polyacrylamide gel.
- 5604 Bhatnagar, G.M. and Freedberg, I.M.: Fractionation and characterization of low molecular weight solubilized proteins of newborn rat keratohyalin granules. *Biochim. Biophys. Acta*, 453 (1976) 1-14 - SDS-polyacrylamide gel, urea-polyacrylamide gel.
- 5605 Boxer, P.A. and Leibovich, S.J.: Production of collagenase by mouse peritoneal macrophages *in vitro*. Characterization of sites of cleavage of tropocollagen. *Biochim. Biophys. Acta*, 444 (1976) 626-632 - SDS-polyacrylamide gel.
- 5606 Brandon, D.L.: The identification of myosin in rabbit hepatocytes. *Eur. J. Biochem.*, 65 (1976) 139-146 - SDS-polyacrylamide gel.
- 5607 Clark, C.C.: Separation of collagen components by acrylamide gel electrophoresis. *Methodology of Connective Tissue Research*. In D.A. Hall (Editor): Joynson-Bruvvers, Oxford, 1976, pp. 205-226; *C.A.*, 86 (1977) 13387g.
- 5608 Culbertson, V.B. and Freedberg, I.M.: Mammalian epidermal keratin. Isolation and characterization of the α -helical proteins from newborn rat. *Biochim. Biophys. Acta*, 490 (1977) 178-191 - SDS-polyacrylamide gel.
- 5609 Fukae, M. and Mechanic, G.L.: Maturation of collagenous tissue: Specific *in vivo* proteolytic cleavage of only $\alpha_1(I)$ chains. *Biochem. Biophys. Res. Commun.*, 71 (1976) 651-657 - polyacrylamide gel.
- 5610 Greene, L.E. and Yount, R.G.: Observations on the kinetics, subunit composition, and sulfhydryl reactivity of myosin from *Physarum polycephalum*. *Biochim. Biophys. Acta*, 480 (1977) 326-332 - SDS-polyacrylamide gel.
- 5611 Inoue, A. and Tonomura, Y.: Separation of subfragment-1 of H-meromyosin into two equimolar fractions with and without formation of the reactive enzyme-phosphate-ADP complex. *J. Biochem.*, 79 (1976) 419-434 - SDS-polyacrylamide gel.
- 5612 Khaitlina, S.Yu. and Pinaev, G.P.: (Differences in the polymerization of actin, isolated at different ontogenesis stages, after its purification). *Biokhimiya*, 41 (1976) 787-793 - polyacrylamide gel.
- 5613 Malik, M.N. and Stracher, A.: Allosteric behavior of platelet myosin. *Arch. Biochem. Biophys.*, 178 (1977) 451-458 - SDS-polyacrylamide gel.

- 5614 Mannschott, P., Herbage, D., Weiss, M. and Buffevant, C.: Collagen heterogeneity in pig heart valves. *Biochim. Biophys. Acta*, 434 (1976) 177-183 - SDS-polyacrylamide gel.
- 5615 Mecham, R.P., Foster, J.A. and Franzblau, C.: Intrinsic enzyme activity associated with tropoelastin. *Biochim. Biophys. Acta*, 446 (1976) 245-254 - SDS-polyacrylamide gel.
- 5616 Merry, A.H., Harwood, R., Wooley, D.E., Grant, M.E. and Jackson, D.S.: Identification and partial characterisation of the non-collagenous amino- and carboxyl-terminal extension peptides of cartilage procollagen. *Biochem. Biophys. Res. Commun.*, 71 (1976) 83-90 - polyacrylamide gel.
- 5617 Osebold, W.R. and Pedrini, V.: Pepsin-solubilized collagen of human nucleus pulposus and annulus fibrosus. *Biochim. Biophys. Acta*, 434 (1976) 390-405 - SDS-polyacrylamide gel, polyacrylamide gel.
- 5618 Ostlund, R.E. and Pastan, I.: The purification and quantitation of myosin from cultured cells. *Biochim. Biophys. Acta*, 453 (1976) 37-47 - SDS-polyacrylamide gel.
- 5619 Porzio, M.A. and Pearson, A.M.: Improved resolution of myofibrillar proteins with sodium dodecyl sulfate-polyacrylamide gel electrophoresis. *Biochim. Biophys. Acta*, 490 (1977) 27-34 - SDS-polyacrylamide gel.
- 5620 Sands, H., Penberthy, W., Meyer, T.A. and Jorgensen, R.: Cyclic AMP-stimulated phosphorylation of bovine tracheal smooth muscle contractile and non-contractile proteins. *Biochim. Biophys. Acta*, 445 (1976) 791-801 - SDS-polyacrylamide gel, paper.
- 5621 Weeds, A.G.: Light chains from slow-twitch muscle myosin. *Eur. J. Biochem.*, 66 (1976) 157-173 - SDS-polyacrylamide gel.

20d. Protamines, histones and other nuclear proteins

- 5622 Berdnikov, V.A., Gorel, F.L. and Sharypov, V.F.: (Changes in subfraction composition of chicken lysine-rich histone during ontogenesis). *Biokhimiya*, 41 (1976) 847-853 - polyacrylamide gel.
- 5623 Calvin, H.I.: Comparative analysis of the nuclear basis proteins in rat, human, guinea pig, mouse and rabbit spermatozoa. *Biochim. Biophys. Acta*, 434 (1976) 377-389 - polyacrylamide gel.
- 5624 Christensen, M.E., Beyer, A.L., Walker, B. and LeStourgeon, W.M.: Identification of N^G,N^G-dimethylarginine in a nuclear protein from the lower eukaryote *Physarum polyccephalum* homologous to the major proteins of mammalian 40S ribonucleoprotein particles. *Biochem. Biophys. Res. Commun.*, 74 (1977) 621-629 - isoelectric focusing, polyacrylamide gel.
- 5625 Cohen, M.E. and Kleinsmith, L.J.: Stimulation of uterine nonhistone protein phosphorylation and nuclear protein kinase activity by estradiol-17 β . *Biochim. Biophys. Acta*, 435 (1976) 159-166 - polyacrylamide gel.
- 5626 Lany, F., Lecocq, R. and Dumont, J.E.: Thyrotropin stimulation of the phosphorylation of serine in the N-terminal region of thyroid H1 histones. *Eur. J. Biochem.*, 73 (1977) 529-535 - polyacrylamide gel.
- 5627 Parker, M.G., Sheehan, D.M. and O'Malley, B.W.: Effects of estrogen on gene expression in the chick oviduct. Isolation and fractionation of chromatin non-histone proteins. *Biochim. Biophys. Acta*, 454 (1976) 138-153 - SDS-polyacrylamide gel, acid-urea gel electrophoresis.
- 5628 Pongsawasdi, P. and Svasti, J.: The heterogeneity of the protamines from human spermatozoa. *Biochim. Biophys. Acta*, 434 (1976) 462-473 - urea-polyacrylamide gel, paper.
- 5629 Pospelov, V.A. and Sokolenko, A.A.: (Use of bifunctional reagents in the study of histones topography in chromatin). *Biokhimiya*, 41 (1976) 679-683 - polyacrylamide gel.
- 5630 Reyes, R., Vázquez, D. and Ballesta, J.P.G.: Peptidyl transferase center of rat-liver ribosome cores. *Eur. J. Biochem.*, 73 (1977) 25-31 - SDS-polyacrylamide gel.
- 5631 Simon, J.H. and Becker, W.M.: A polyethylene glycol/dextran procedure for the isolation of chromatin proteins (histones and nonhistones) from wheat germ. *Biochim. Biophys. Acta*, 454 (1976) 154-171 - SDS-polyacrylamide gel, urea-polyacrylamide gel.
- 5632 Smith, L.S., Kern, C.W., Halpern, R.M. and Smith, R.A.: Phosphorylation on basic amino acids in myelin basic protein. *Biochem. Biophys. Res. Commun.*, 71 (1976) 459-465 - polyacrylamide gel.

5633 Tanuma, S., Enomoto, T. and Yamada, M.: Distribution of poly(ADP-ribose) in histones of HeLa cell nuclei. *Biochem. Biophys. Res. Commun.*, 74 (1977) 599-605 - polyacrylamide gel.

5634 Umansky, S.R., Zotova, R.N. and Kovalev, Y.I.: Comparison of some properties of chromatin non-histone proteins and nuclear sap proteins. *Eur. J. Biochem.*, 65 (1976) 503-512 - SDS-polyacrylamide gel.

20e. Chromoproteins and metalloproteins

5635 Danilova, L.A.: (Identification of hemoglobin components prepared during agar gel electrophoresis). *Lab. Delo*, (1976) 531-534; *C.A.*, 85 (1976) 173674f.

5636 Gacon, G., Krishnamoorthy, R., Wajcman, H., Labie, D., Tapon, J. and Cosson, A.: Hemoglobin Djelfa B98 (FG 5) Val⁸Ala: isolation and functional properties of the heme saturated form. *Biochim. Biophys. Acta*, 490 (1977) 156-163 - isoelectric focusing.

5637 Katan, M.B., Pool, L. and Groot, G.S.P.: The cytochrome bc_1 complex of yeast mitochondria. Isolation and partial characterization of the cytochrome bc_1 complex and cytochrome b. *Eur. J. Biochem.*, 65 (1976) 95-105 - SDS-polyacrylamide gel.

5638 Kinkade, J.M., Jr., Miller, W.W.K., III and Segars, F.M.: Isolation and characterization of murine lactoferrin. *Biochim. Biophys. Acta*, 446 (1976) 407-418 - SDS-polyacrylamide gel, cellulose acetate, isoelectric focusing.

5639 Makey, D.G. and Seal, U.S.: The detection of four molecular forms of human transferrin during the iron binding process. *Biochim. Biophys. Acta*, 453 (1976) 250-256 - urea-polyacrylamide gel.

5640 Nuñez, M.T., Fischer, S., Glass, J. and Lavidor, L.: The cross-linking of ^{125}I -labelled transferrin to rabbit reticulocytes. *Biochim. Biophys. Acta*, 490 (1977) 87-93 - SDS-polyacrylamide gel.

5641 Oganezova, E.P. and Nalbandyan, R.M.: (Purification and properties of plastocyanin and ferredoxin from *Ceratophyllum demersum* L.) *Biokhimiya*, 41 (1976) 794-800 - polyacrylamide gel.

5642 Srouji, A.H. and Macleod, R.M.: Demonstration and isolation of the hybrid hemoglobulins $\alpha_2^A \beta^A \beta^C$ and $\alpha_2^S \beta^S \beta^C$. *Biochim. Biophys. Acta*, 453 (1976) 15-25 - starch gel.

5643 Suttnar, J., Hrkáč, Z. and Vodrážka, Z.: Affinity chromatography of serum haemopexin. *J. Chromatogr.*, 131 (1977) 453-457 - polyacrylamide gel.

20f. Varia, with special reference to non-identified and tissue proteins

5644 Blackburn, G.R., Bornens, M. and Kasper, C.B.: Characterization of the membrane matrix derived from the microsomal fraction of rat hepatocytes. *Biochim. Biophys. Acta*, 436 (1976) 387-398 - SDS-polyacrylamide gel.

5645 Bond, L.W. and Pynadath, T.I.: Partial purification and properties of the fatty acid elongation systems in the outer and inner membranes of beef liver mitochondria. *Biochim. Biophys. Acta*, 450 (1976) 8-20 - polyacrylamide gel.

5646 Cammay de Mate, H., Banfi, Y.P., Korc, I. and Souza, N.A.: Cellulose acetate electrophoresis of soluble lens proteins of different species of mammals; the use of discontinuous buffer systems. *Comp. Biochem. Physiol. B*, 55 (1976) 45-48; *C.A.*, 86 (1977) 13377d.

5647 Changeux, J.P.: Cholinergic receptors in *Electrophorus*. *Neurosci. Res. Program Bull.*, 11 (1973) 246-252, 271-294; *C.A.*, 85 (1976) 174495k.

5648 Cox, J.A., Wnuk, W. and Stein, E.A.: Isolation and properties of a sarcoplasmic calcium-binding protein from crayfish. *Biochemistry*, 15 (1976) 2613-2618 - polyacrylamide gel.

5649 Dahl, D.: Isolation and initial characterization of glial fibrillary acidic protein from chicken, turtle, frog and fish central nervous systems. *Biochim. Biophys. Acta*, 446 (1976) 41-50 - SDS-polyacrylamide gel, SDS-urea gel.

5650 Fujimoto, K., Roots, B.I., Burton, R.M. and Agarwal, H.C.: Morphological and biochemical characterization of light and heavy myelin isolated from developing rat brain. *Biochim. Biophys. Acta*, 426 (1976) 659-668 - SDS-polyacrylamide gel.

5651 Furukawa, Y., Matsunaga, Y. and Hayashi, K.: Purification and characterization of a coagulant protein from the venom of Russell's viper. *Biochim. Biophys. Acta*, 453 (1976) 48-61 - polyacrylamide gel, isoelectric focusing.

- 5652 Helmkamp, G.M., Jr., Wirtz, K.W.A. and Van Deenen, L.L.M.: Phosphatidylinositol exchange protein effects of membrane structure on activity and evidence for a ping-pong mechanism. *Arch. Biochem. Biophys.*, 174 (1976) 592-602 - polyacrylamide gel.
- 5653 Hirose, A., Kumagai, J. and Imahori, K.: Dissociation and reconstitution of colicin E 3 and immunity substance complex. *J. Biochem.*, 79 (1976) 305-311 - polyacrylamide gel.
- 5654 Huebers, H., Huebers, E. and Crichton, R.R.: Isolation and characterization of iron-binding proteins from rat intestinal mucosa. *Eur. J. Biochem.*, 66 (1976) 445-447 - polyacrylamide gel, isoelectric focusing.
- 5655 Kramps, H.A., Hoenders, H.J. and Wollensak, J.: Protein changes in the human lens during development of senile nuclear cataract. *Biochim. Biophys. Acta*, 434 (1976) 32-43 - isoelectric focusing, SDS-polyacrylamide gel.
- 5656 Krychevskaya, A.A., Sinichkina, A.A., Prokofyev, V.N., Khlobystrov, V.V. and Kucharenko, N.A.: (Investigation of rat brain prealbumins). *Biokhimiya*, 42 (1977) 230-237 - polyacrylamide gel.
- 5657 Kyriakopoulos, A. and Subramanian, A.R.: Positions of individual ribosomal proteins after two-dimensional electrophoresis by a sensitive procedure. *Biochim. Biophys. Acta*, 474 (1977) 308-311 - polyacrylamide gel, SDS-polyacrylamide gel.
- 5658 McCumber, L.J. and Clem, L.W.: Esterification of J chain and its effect on electrophoretic mobility in sodium dodecyl sulfate polyacrylamide gels. *Biochim. Biophys. Acta*, 446 (1976) 536-541 - SDS-polyacrylamide gel, urea-polyacrylamide gel.
- 5659 Mosebach, K.O., Lippert, V., Dardenne, M.V. and Pfeiff, B.: An electrophoretic system for analyzing labeled drug-binding proteins in eye tissues. *Ophthalmic Res.*, 8 (1976) 207-212; *C.A.*, 85 (1976) 173671c.
- 5660 Otto, B., Baynes, M. and Knippers, R.: A single-strand-specific DNA-binding protein from mouse cells that stimulates DNA polymerase. *Eur. J. Biochem.*, 73 (1977) 17-24 - SDS-polyacrylamide gel.
- 5661 Pazur, J.H. and Dreher, K.L.: Anti-glycosyl antibodies: Resolution of anti-gal isoantibodies into individual components by electrofocusing. *Biochem. Biophys. Res. Commun.*, 74 (1977) 818-824 - isoelectric focusing, polyacrylamide gel.
- 5662 Redfield, B., Liu, C.-K. and Weissbach, H.: Purification and properties of rabbit reticulocyte elongation factor 1. *Arch. Biochem. Biophys.*, 174 (1976) 603-612 - SDS-polyacrylamide gel.
- 5663 Reich, E.: Purification and properties of a nicotinic receptor from *Electrophorus electricus*. *Neurosci. Res. Program Bull.*, 11 (1973) 257-263, 271-294; *C.A.*, 85 (1976) 174496m.
- 5664 Roberts, G.P. and Parker, J.M.: Fractionation and comparison of proteins from bovine uterine fluid and bovine allantoic fluid. *Biochim. Biophys. Acta*, 446 (1976) 69-76 - polyacrylamide gel, SDS-polyacrylamide gel.
- 5665 Sakamoto, W. and Nishikaze, O.: Immunochemical study of β -glucuronidase inhibitor from porcine sublingual gland. Relationship between the antigenic determinant and the active site of the inhibitor. *Biochim. Biophys. Acta*, 451 (1976) 259-266 - immunoelectrophoresis.
- 5666 Sawada, H. and Kashiwamata, S.: Sodium dodecyl sulfate-disc gel electrophoresis patterns of bovine lung surfactant. *Biochim. Biophys. Acta*, 490 (1977) 44-50 - SDS-polyacrylamide gel.
- 5667 Slaby, F. and Bryan, J.: High uptake of myo-inositol by rat pancreatic tissue *in vitro* stimulates secretion. *J. Biol. Chem.*, 251 (1976) 5078-5086 - polyacrylamide gel.
- 5668 Vandrey, J.P., Goldenberg, C.J. and Eliceiri, G.L.: *In vivo* isotope incorporation patterns into HeLa ribosomal proteins. *Biochim. Biophys. Acta*, 432 (1976) 104-112 - two dimensional gel electrophoresis, polyacrylamide gel.

See also 5511, 5540.

20g. Enzymes: oxidoreductases

- 5669 Akimenko, V.K. and Medentsev, A.G.: (Isolation and properties of cytoplasmic L(+)-lactatoxydase of *Candida lipolytica* yeasts). *Biokhimiya*, 41 (1976) 665-672 - polyacrylamide gel.

- 5670 Capaldi, R.A., Bell, R.L. and Branchek, T.: Changes in order of migration of polypeptides in complex III and cytochrome *c* oxidase under different conditions of SDS polyacrylamide gel electrophoresis. *Biochem. Biophys. Res. Commun.*, 74 (1977) 425-433 - polyacrylamide gel.
- 5671 Di Matteo, G., Di Prisco, G. and Romeo, G.: Mitochondrial and nuclear glutamate dehydrogenase in Chinese hamster ovary cells in culture. *Biochim. Biophys. Acta*, 429 (1976) 694-704 - cellulose acetate, Cellogel.
- 5672 Dons, R.F. and Doughty, C.C.: Isolation and characterization of aldose reductase from calf brain. *Biochim. Biophys. Acta*, 452 (1976) 1-12 - isoelectric focusing, SDS-polyacrylamide gel.
- 5673 Fredricks, W.W. and Gehl, J.M.: Multiple forms of ferredoxin-nicotinamide adenine dinucleotide phosphate reductase from spinach. *Arch. Biochem. Biophys.*, 174 (1976) 666-674 - polyacrylamide gel.
- 5674 Gogotov, I.N., Zorin, N.A. and Kondratieva, E.N.: (Purification and properties of *Thiocapsa roseopersicina* hydrogenase). *Biokhimiya*, 41 (1976) 836-842 - polyacrylamide gel.
- 5675 Jinks, D.C. and Matz, L.L.: The reduced nicotinamide adenine dinucleotide "oxidase" of *Acholeplasma laidlawii* membranes. *Biochim. Biophys. Acta*, 430 (1976) 71-82 - polyacrylamide gel.
- 5676 Jinks, D.C. and Matz, L.L.: Purification of the reduced nicotinamide adenine dinucleotide dehydrogenase from membranes of *Acholeplasma laidlawii*. *Biochim. Biophys. Acta*, 452 (1976) 30-41 - polyacrylamide gel.
- 5677 Kahn, A., Bertrand, O., Cottreau, D., Boivin, P. and Dreyfus, J.-C.: Studies on the nature of different molecular forms of glucose-6-phosphate dehydrogenase purified from human leukocytes. *Biochim. Biophys. Acta*, 445 (1976) 537-548 - SDS-polyacrylamide gel, starch gel, isoelectric focusing.
- 5678 McCarville, M. and Marshall, V.: Partial purification and characterization of a bacterial enzyme catalyzing reductive cleavage of anthracycline glycosides. *Biochem. Biophys. Res. Commun.*, 74 (1977) 331-335 - polyacrylamide gel.
- 5679 Marklund, S., Beckmann, G. and Stigbrand, T.: A comparison between the common type and a rare genetic variant of human cupro-zinc superoxide dismutase. *Eur. J. Biochem.*, 65 (1976) 415-422 - polyacrylamide gel.
- 5680 O'Brien, T.A., Schrock, H.L., Russell, P., Blake, R., II and Gennis, R.B.: Preparation of *Escherichia coli* pyruvate oxidase utilizing a thiamine pyrophosphate affinity column. *Biochim. Biophys. Acta*, 452 (1976) 13-29 - isoelectric focusing, SDS-polyacrylamide gel.
- 5681 Reddy, V.A. and Rao, N.A.: Dihydrofolate reductase from soybean seedlings. Characterization of the enzyme purified by affinity chromatography. *Arch. Biochem. Biophys.*, 174 (1976) 675-683 - SDS-polyacrylamide gel.
- 5682 Sato, S. and Harris, J.J.: Superoxide dismutase from *Thermus aquaticus*. Isolation and characterization of manganese and apo-enzymes. *Eur. J. Biochem.*, 73 (1977) 373-381 - SDS-polyacrylamide gel, cellulose acetate.
- 5683 Schneider, K. and Schlegel, H.G.: Purification and properties of soluble hydrogenase from *Alcaligenes eutrophus* H 16. *Biochim. Biophys. Acta*, 452 (1976) 66-80 - polyacrylamide gel, isoelectric focusing.
- 5684 Teague, W.M. and Henney, H.R., Jr.: Physical properties and chemical compositions of cytoplasmic and mitochondrial malate dehydrogenase from *Physarum polycephalum*. *Biochim. Biophys. Acta*, 434 (1976) 118-125 - isoelectric focusing polyacrylamide gel, SDS-polyacrylamide gel.

20h. Enzymes: transferases

- 5685 Barra, D., Bossa, F., Doonan, S., Fahmy, H.M.A., Martini, F. and Hughes, G.J.: Large-scale purification and some properties of the mitochondrial aspartate aminotransferase from pig heart. *Eur. J. Biochem.*, 64 (1976) 519-526 - SDS-polyacrylamide gel.
- 5686 Chén, L.-J., Bolt, R.J. and Admirand, W.H.: Enzymatic sulfation of bile salts. Partial purification and characterization of an enzyme from rat liver that catalyzes the sulfation of bile salts. *Biochim. Biophys. Acta*, 480 (1977) 219-227 - isoelectric focusing.
- 5687 Daegelen-Proux, D., Pierres, M., Alexandre, Y. and Dreyfus, J.-C.: Molecular heterogeneity of rabbit heart phosphorylase kinase. *Biochim. Biophys. Acta*, 452 (1976) 398-405 - Perikon.

- 5688 Dezélée, S., Wyers, F., Sentenac, A. and Fromageot, P.: Two forms of RNA polymerase B in yeast. Proteolytic conversion *in vitro* of enzyme B_I into B_{II}. *Eur. J. Biochem.*, 65 (1976) 543-552 - polyacrylamide gel.
- 5689 Egly, J.M., Schmitt, M. and Kempf, J.: Characterization of a protein kinase-phosphoprotein system in free cytoplasmic ribonucleoprotein particles of plasma cell tumours. *Biochim. Biophys. Acta*, 454 (1976) 549-557 - SDS-polyacrylamide gel.
- 5690 Eronova, T.B., Silanova, G.V. and Livanova, N.B.: (Isolation and properties of glycogen phosphorylase b from rabbit liver). *Biokhimiya*, 42 (1977) 257-266 - SDS-polyacrylamide gel.
- 5691 Fábry, M., Sümegei, J. and Venetianer, P.: Purification and properties of the RNA polymerase of an extremely thermophilic bacterium: *Thermus aquaticus* T2. *Biochim. Biophys. Acta*, 435 (1976) 228-235 - SDS-polyacrylamide gel.
- 5692 Hoggett, J.G. and Kellett, G.L.: Yeast hexokinase: substrate-induced association-dissociation reactions in the binding of glucose to hexokinase P-II. *Eur. J. Biochem.*, 66 (1976) 65-77 - isoelectric focusing, polyacrylamide gel.
- 5693 Ikeda, T., Konishi, Y. and Ichihara, A.: Transaminase of branched chain amino acids. XI. Leucine (methionine) transaminase of rat liver mitochondria. *Biochim. Biophys. Acta*, 445 (1976) 622-631 - polyacrylamide gel.
- 5694 Inoue, M., Horiuchi, S. and Morino, Y.: Affinity labeling of rat-kidney γ -glutamyl transpeptidase. *Eur. J. Biochem.*, 73 (1977) 335-342 - SDS-polyacrylamide gel.
- 5695 Marie, J., Kahn, A. and Boivin, P.: L-Type pyruvate kinase from human liver. Purification by double-affinity elution, electrofocusing and immunological studies. *Biochim. Biophys. Acta*, 438 (1976) 393-406 - isoelectric focusing, SDS-polyacrylamide gel, polyacrylamide gel.
- 5696 Moyer, T.P. and Fischer, A.G.: Purification and characterization of a purine-nucleoside phosphorylase from bovine thyroid. *Arch. Biochem. Biophys.*, 174 (1976) 622-629 - isoelectric focusing, polyacrylamide gel.
- 5697 Salokangas, A., Talmedge, K., Bechtel, E., Eppenberger, U. and Chrambach, A.: Calf-ovary protein kinases dependent on adenosine 3':5'-monophosphate. Analysis by electrophoresis and electrofocusing on polyacrylamide gel. *Eur. J. Biochem.*, 73 (1977) 401-409 - polyacrylamide gel, isoelectric focusing.
- 5698 Sanders, J.L., Joung, J.I. and Rochman, H.: The further heterogeneity of creatine kinase. Presence of isoenzymes of cathodic mobility in rat tissues. *Biochim. Biophys. Acta*, 438 (1976) 407-411 - agarose membrane.
- 5699 Schneider, E.G. and Kennedy, E.P.: Partial purification and properties of diglyceride kinase from *Escherichia coli*. *Biochim. Biophys. Acta*, 441 (1976) 201-212 - polyacrylamide gel.
- 5700 Scragg, A.H.: The isolation and properties of a DNA-directed RNA polymerase from yeast mitochondria. *Biochim. Biophys. Acta*, 442 (1976) 331-342 - SDS-polyacrylamide gel, polyacrylamide gel.
- 5701 Walter, R.D.: Nucleoside-dependent protein kinase from *Trypanosoma gambiense*. *Biochim. Biophys. Acta*, 429 (1976) 137-146 - isoelectric focusing.

20i. Enzymes: hydrolases

- 5702 Abdel-Monem, M. and Hoffmann-Berling, H.: Enzymatic unwinding of DNA. I. Purification and characterization of a DNA-dependent ATPase from *Escherichia coli*. *Eur. J. Biochem.*, 65 (1976) 431-440 - SDS-polyacrylamide gel.
- 5703 Afanasiieva, T.P., Uryson, S.O. and Kulaev, I.S.: (Multiple forms of polyphosphate phosphohydrolase from *Endomyces magnusii*). *Biokhimiya*, 41 (1976) 1078-1086 - polyacrylamide gel, isoelectric focusing.
- 5704 Alimova, M.M.: (Methods for electrophoretic separation of gastric juice pepsin in agar gel). *Lab. Delo*, (1976) 534-538; *C.A.*, 85 (1976) 173246t.
- 5705 Boffa, G.A., Boffa, M.-C. and Winchenne, J.-J.: A phospholipase A₂ with anticoagulant activity. I. Isolation from *Vipera berus* venom and properties. *Biochim. Biophys. Acta*, 429 (1976) 828-838 - isoelectric focusing.
- 5706 Carreira, J., Munoz, E., Andreu, J.M. and Nieto, M.: *Micrococcus lysodeikticus* membrane ATPase. Effect of trypsin on stimulation of a purified form of the enzyme and identification of its natural inhibitor. *Biochim. Biophys. Acta*, 436 (1976) 183-189 - SDS-polyacrylamide gel.
- 5707 Del Rio, L.A. and Berkeley, R.C.W.: Exo- β -N-acetylmuramidase - A novel hexosaminidase. Production by *Bacillus subtilis* B, purification and characterization. *Eur. J. Biochem.*, 65 (1976) 3-12 - polyacrylamide gel.

- 5708 Devaux, C., Ménard, J., Sicard, P. and Corvol, P.: Partial characterization of hog renin purified by affinity chromatography. *Eur. J. Biochem.*, 64 (1976) 621-627 - polyacrylamide gel, isoelectric focusing.
- 5709 Du Toit, P.J.: Isolation and partial characterization of a protease from *Agave americana variegata*. *Biochim. Biophys. Acta*, 429 (1976) 895-911 - isoelectric focusing.
- 5710 Emi, S., Myers, D.V. and Iacobucci, G.A.: Coupling of the *Penicillium duponti* acid protease to ethylene-maleic acid (1:1) linear copolymer. Preparation and properties of the water-soluble derivative. *Biochim. Biophys. Acta*, 445 (1976) 672-682 - isoelectric focusing.
- 5711 Etherington, D.J., Newman, P.B., Dainty, R.H. and Partidge, S.M.: Purification and properties of the extracellular metallo-proteinases of *Chromobacterium lividum* (NCIB 10926). *Biochim. Biophys. Acta*, 445 (1976) 739-752 - isoelectric focusing, agar gel, SDS-polyacrylamide gel.
- 5712 Flanagan, P.R. and Zbarsky, S.H.: Rat intestinal phosphodiesterase II. Properties of the purified enzyme and its inactivation by iodoacetic acid. *Biochim. Biophys. Acta*, 480 (1977) 204-218 - isoelectric focusing, polyacrylamide gel.
- 5713 Fujimoto, M., Kameji, T., Kanaya, A. and Hagiwara, H.: Purification and properties of rat small intestinal arginase. *J. Biochem.*, 79 (1976) 441-449 - polyacrylamide gel.
- 5714 Höckel, M., Hull, F.W., Risi, S. and Dose, K.: Mg^{2+} -(13 S) ATPase from *Micrococcus* sp. ATCC 398E. The effect of trypsin on the purified enzyme. *Biochim. Biophys. Acta*, 429 (1976) 1020-1028 - polyacrylamide gel, SDS-polyacrylamide gel.
- 5715 Iordan, A.G. and Belozersky, M.A.: (Properties and substrate specificity of proteinase from buckwheat seeds). *Biokhimiya*, 41 (1976) 673-678 - polyacrylamide gel.
- 5716 Kaneshiro, C.M. and Reithel, F.J.: The self-association of jack bean urease and its modification by silver ions. *Arch. Biochem. Biophys.*, 174 (1976) 647-650 - SDS-polyacrylamide gel.
- 5717 Kasche, V., Amnéus, H., Gabel, D. and Näslund, L.: Rapid zymogen activation and isolation of serine proteases from an individual mouse pancreas by affinity chromatography. Genetical heterogeneity of chymotrypsins of *Mus musculus*. *Biochim. Biophys. Acta*, 490 (1977) 1-18 - isoelectric focusing.
- 5718 Keil-Dlouha, V.: Chemical characterization and study of the autodigestion of pure collagenase from *Achromobacter iophagus*. *Biochim. Biophys. Acta*, 429 (1976) 239-251 - polyacrylamide gel.
- 5719 Khandelwal, R.L., Vandeneede, J.R. and Krebs, E.G.: Purification, properties, and substrate specificities of phosphoprotein phosphatase(s) from rabbit liver. *J. Biol. Chem.*, 251 (1976) 4850-4858 - polyacrylamide gel.
- 5720 Kimura, S.: Insect haemolymph exo- β -N-acetylglucosaminidase from *Bombyx mori*. Purification and properties. *Biochim. Biophys. Acta*, 446 (1976) 399-406 - SDS-polyacrylamide gel.
- 5721 Lakshmi, M.B. and Subrahmanyam, D.: Separation and detection of lipases using polyacrylamide gel electrophoresis. *J. Chromatogr.*, 130 (1977) 441-443 - polyacrylamide gel.
- 5722 Lenney, J.F.: Specificity and distribution of mammalian carnosinase. *Biochim. Biophys. Acta*, 429 (1976) 214-219 - isoelectric focusing.
- 5723 Levine, N., Hatcher, V.B. and Lazarus, G.S.: Proteinases of human epidermis; a possible mechanism for polymorphonuclear leukocyte chemotaxis. *Biochim. Biophys. Acta*, 452 (1976) 458-467 - SDS-polyacrylamide gel.
- 5724 Mascall, G.C. and Evans, R.T.: Study of serum cholinesterase variants by means of one- and two-dimensional electrophoresis in density gradient polyacrylamide. *J. Chromatogr.*, 143 (1977) 77-82 - polyacrylamide gel.
- 5725 Matzku, S. and Rapp, W.: Purification of human gastric proteases by immuno-adsorbents: pepsinogen II-group. *Biochim. Biophys. Acta*, 446 (1976) 30-40 - polyacrylamide gel, agarose, two dimensional immuno-electrophoresis.
- 5726 Mildner, P., Barbaric, S., Golubic, Z. and Ries, B.: Purification of protoplast-secreted acid phosphatase from baker's yeast. Effect on adenosine triphosphatase activity. *Biochim. Biophys. Acta*, 429 (1976) 274-282 - isoelectric focusing, cellulose acetate, polyacrylamide gel.
- 5727 Nagasawa, T., Sugisaki, H., Tani, Y. and Ogata, K.: Purification and characterization of butyrylcholine hydrolyzing enzyme from *Pseudomonas polycolor*. *Biochim. Biophys. Acta*, 429 (1976) 817-827 - isoelectric focusing.

- 5728 Nieuwenhuizen, W., Reman, F.C., Vermeer, I.A.M. and Vermond, T.: Purification and properties of two lipases from pig adipose tissue. *Biochim. Biophys. Acta*, 431 (1976) 288-296 - isoelectric focusing, polyacrylamide gel.
- 5729 Nishijima, M., Nakaike, S., Tamori, Y. and Nojima, S.: Detergent-resistant phospholipase A of *Escherichia coli* K-12. Purification and properties. *Eur. J. Biochem.*, 73 (1977) 115-124 - SDS-polyacrylamide gel.
- 5730 Nose, K.: Purification and characterization of alkaline phosphatase from rat kidney. *J. Biochem.*, 79 (1976) 283-288 - isoelectric focusing.
- 5731 Parish, R.W.: A labile acid phosphatase isozyme associated with the surface of vegetative *Dictyostelium discoideum* cells. *Biochim. Biophys. Acta*, 444 (1976) 802-809 - polyacrylamide gel.
- 5732 Schuber, F. and Travo, P.: Calf-spleen nicotinamide-adenine dinucleotide glycohydrolase. Solubilization, purification and properties of the enzyme. *Eur. J. Biochem.*, 65 (1976) 247-255 - polyacrylamide gel.
- 5733 Shoaf, C.R., Berko, R.M. and Heizer, W.D.: Isolation and characterization of four peptide hydrolases from the brush border of rat intestinal mucosa. *Biochim. Biophys. Acta*, 445 (1976) 694-719 - polyacrylamide gel (analytical and preparative), starch gel.
- 5734 Soberano, M.E., Ong, E.B., Johnson, A.J., Levy, M. and Schoellmann, G.: Purification and characterization of two forms of urokinase. *Biochim. Biophys. Acta*, 445 (1976) 763-773 - isoelectric focusing, SDS-polyacrylamide gel.
- 5735 Stevens, R.L., Fluharty, A.L., Killgrove, A.R. and Kihara, H.: Microheterogeneity of arylsulfatase A from human tissues. *Biochim. Biophys. Acta*, 445 (1976) 661-671 - isoelectric focusing.
- 5736 Tobias, P.S. and Schumacher, G.F.B.: Observation of two proacrosins in extracts of human spermatozoa. *Biochem. Biophys. Res. Commun.*, 74 (1977) 434-439 - polyacrylamide gel.
- 5737 Tornqvist, H. and Belfrage, P.: Purification and some properties of a monoacylglycerol-hydrolyzing enzyme of rat adipose tissue. *J. Biol. Chem.*, 251 (1976) 813-819 - isoelectric focusing, polyacrylamide gel.
- 5738 Tripathi, R.K. and O'Brien, R.D.: Purification of acetylcholinesterase from housefly brain by affinity chromatography. *Biochim. Biophys. Acta*, 480 (1977) 382-389 - polyacrylamide gel.
- 5739 Zolotova, V.S., Tikhomirova, A.S., Kozlov, L.V. and Antonov, V.K.: (Modification and immobilization of β -galactosidase). *Biokhimiya*, 41 (1976) 1671-1676 - isoelectric focusing.

20k. Enzymes: lyases

- 5740 Akopyan, T.N. and Goryachenkova, E.V.: (Beta-cyanoalanine synthase: purification and characterization). *Biokhimiya*, 41 (1976) 906-914 - polyacrylamide gel.
- 5741 Johnson, P.G., Waheed, A., Jones, L., Glaid, A.J. and Gawron, O.: Identification of an essential residue of pig heart aconitase. *Biochem. Biophys. Res. Commun.*, 74 (1977) 384-389 - cellulose.
- 5742 Sabaliauskienė, V.L. and Glemžha, A.A.: (Purification and some properties of pyruvate decarboxylase from bovine brain). *Biokhimiya*, 41 (1976) 1028-1032 - polyacrylamide gel.

20l. Enzymes: isomerases

- 5743 Sahm, H., Schütte, H. and Kula, M.-R.: Purification and properties of 3-hexulosephosphate synthase from *Methylomonas* M 15. *Eur. J. Biochem.*, 66 (1976) 591-596 - polyacrylamide gel.
- 5744 Vater, J. and Kleinkauf, H.: Gramicidin S-synthetase. A further characterization of phenylalanine racemase, the light enzyme of gramicidin S-synthetase. *Biochim. Biophys. Acta*, 429 (1976) 1062-1072 - isoelectric focusing, polyacrylamide gel.

20m. Enzymes: ligases

- 5745 Hirshfield, I.N., Yeh, F.-M. and Zamecnik, P.C.: An *in vivo* effect of the metabolites L-alanine and glycyl-L-leucine on the properties of lysyl-tRNA synthetase from *Escherichia coli* K-12. I. Influence of subunit composition and molecular weight distribution. *Biochim. Biophys. Acta*, 435 (1976) 290-305 - polyacrylamide gel, SDS-polyacrylamide gel.

- 5746 Knopf, K.-W.: Simple isolation method and assay for T4 DNA ligase and characterization of the purified enzyme. *Eur. J. Biochem.*, 73 (1977) 33-38 - agarose gel, isoelectric focusing, SDS-polyacrylamide gel.
- 5747 Koischwitz, H. and Kleinkauf, H.: Gramicidin-S-synthetase. Electrophoretic characterization of the multienzyme. *Biochim. Biophys. Acta*, 429 (1976) 1052-1061 - polyacrylamide gel, SDS-polyacrylamide gel.
- 5748 O'Sullivan, J. and Ettlinger, L.: Characterization of the acetyl-CoA synthetase of *Acetobacter aceti*. *Biochim. Biophys. Acta*, 450 (1976) 410-417 - SDS-polyacrylamide gel.
- 5749 Pan, F., Lee, H.H., Pai, S.H., Yu, T.C., Guco, J.Y. and Duh, G.M.: Multiple molecular forms of cysteinyl-tRNA synthetase from rat liver: purification and subunit structure. *Biochim. Biophys. Acta*, 452 (1976) 217-283 - SDS-polyacrylamide gel.
- 5750 Satyanarayana, T. and Klein, H.P.: Studies on the "aerobic" acetyl-coenzyme A synthetase of *Saccharomyces cerevisiae*: purification, crystallization and physical properties of the enzyme. *Arch. Biochem. Biophys.*, 174 (1976) 480-490 - polyacrylamide gel.

20n. Enzymes: complex mixtures

- 5751 Chiu, H.-I., Franks, D.J., Rowe, R. and Malamud, D.: Cyclic AMP metabolism in mouse parotid glands. Properties of adenylate cyclase, protein kinase and phosphodiesterase. *Biochim. Biophys. Acta*, 451 (1976) 29-40 - isoelectric focusing.
- 5752 Fall, R.R.: Stabilization of an acetyl-coenzyme A carboxylase complex from *Pseudomonas citronellolis*. *Biochim. Biophys. Acta*, 450 (1976) 475-480 - SDS-polyacrylamide gel.
- 5753 Nombela, C., Redfield, B., Ochoa, S. and Weissbach, H.: Elongation factor 1 from *Artemia salina*: properties and disaggregation of the enzyme. *Eur. J. Biochem.*, 65 (1976) 395-402 - SDS-polyacrylamide gel.
- 5754 Reif, U., Winterhoff, U. and Doerfler, W.: Characterization of the pH 4.0 endonuclease from adenovirus-type-2-infected KB cells. *Eur. J. Biochem.*, 73 (1977) 327-333 - SDS-polyacrylamide gel.
- 5755 Watanabe, Y., Hamada, N., Morita, M. and Tsujisaka, Y.: Purification and properties of a polyvinyl alcohol-degrading enzyme produced by a strain of *Pseudomonas*. *Arch. Biochem. Biophys.*, 174 (1976) 575-581 - isoelectric focusing.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

21a. Purines, pyrimidines, nucleosides, nucleotides

- 5756 Ab, G., Roskam, W.G., Dijkstra, J., Mulder, J., Willems, M., Van der Ende, A. and Gruber, M.: Estradiol-induced synthesis of vitellogenin. III. The isolation and characterization of vitellogenin messenger RNA from avian liver. *Biochim. Biophys. Acta*, 454 (1976) 67-78 - SDS-polyacrylamide gel.
- 5757 Beltchev, B., Yaneva, M. and Staynov, D.: Thermal melting curves of tRNA^{Phe} from yeast lacking different numbers of nucleotides from the 3'-end. *Eur. J. Biochem.*, 64 (1976) 507-510 - polyacrylamide gel.
- 5758 Boime, I., McWilliams, D., Szcesna, E. and Camel, M.: Synthesis of human placental lactogen messenger RNA as a function of gestation. *J. Biol. Chem.*, 251 (1976) 820-825 - polyacrylamide gel.
- 5759 Bozarth, R.F. and Harley, E.H.: The electrophoretic mobility of double-stranded RNA in polyacrylamide gels as a function of molecular weight. *Biochim. Biophys. Acta*, 432 (1976) 329-335 - polyacrylamide gel.
- 5760 Davenport, L.W., Taylor, R.H. and Dubin, D.T.: Comparison of human and hamster mitochondrial transfer RNA. Physical properties and methylation status. *Biochim. Biophys. Acta*, 447 (1976) 285-293 - polyacrylamide gel, paper.
- 5761 Devos, R., van Emmelo, J., Seurinck-Opsomer, C., Gillis, E. and Fiers, W.: Addition by ATP: RNA adenylyltransferase from *Escherichia coli* of 3'-linked oligo(A) to bacteriophage Q β RNA and its effect on RNA replication. *Biochim. Biophys. Acta*, 447 (1976) 319-327 - polyacrylamide gel.
- 5762 Dobrzanska, M. and Buchowicz, J.: High molecular weight UMP-rich RNA of germinating wheat embryo. *Biochim. Biophys. Acta*, 432 (1976) 73-79 - polyacrylamide gel.

- 5763 Galibert, F. and Hampe, A.: 5.9-S RNA, a new RNA characterized in several mammalian cell lines. *Eur. J. Biochem.*, 73 (1977) 359-365 - polyacrylamide gel, cellulose acetate.
- 5764 Ishikawa, H.: Arthropod ribosomes. Integrity of ribosomal ribonucleic acids from aphids and water fleas. *Biochim. Biophys. Acta*, 435 (1976) 258-268 - polyacrylamide gel.
- 5765 Jacob, E.: Histone-gene reiteration in the genome of mouse. *Eur. J. Biochem.*, 65 (1976) 275-284 - polyacrylamide gel.
- 5766 Meier, J.R. and Browstein, B.H.: Structure, synthesis, and post-transcriptional modification of ribosomal ribonucleic acid in *Bdellovibrio bacteriovirus*. *Biochim. Biophys. Acta*, 454 (1976) 86-96 - SDS-polyacrylamide gel.
- 5767 Vermorken, A.J.M., Hilderink, J.M.C.H., Van de Ven, W.J.M. and Bloemendaal, H.: Isolation and translation of non-crystallin messenger RNA from calf lens. *Biochim. Biophys. Acta*, 454 (1976) 447-456 - SDS-polyacrylamide gel.
- 5768 Vigestane, R.J., Alexandrova, L.A., Streltsov, S.A., Victorova, L.S., Kukhanova, M.K. and Gottikov, B.P.: (Peculiarities of dansyl-dipeptidyl-tRNA interaction with *E. coli* ribosomes). *Biokhimiya*, 41 (1976) 1641-1644 - paper.

21c. Nucleic acids: DNA

- 5769 Altenburger, W., Hörz, W. and Zachau, H.G.: Comparative analysis of three guinea pig satellite DNAs by restriction nucleases. *Eur. J. Biochem.*, 73 (1977) 393-400 - polyacrylamide gel.
- 5770 De Vries, F.A.J., Collins, C.J. and Jackson, D.A.: Joining of simian virus 40 DNA molecules at endonuclease R Eco R₁ sites by polynucleotide ligase and analysis of the products by agarose gel electrophoresis. *Biochim. Biophys. Acta*, 453 (1976) 213-227 - agarose gel.
- 5771 Karyagina, I.Yu., Myulberg, A.A., Tischenko, L.I. and Ashmarin, I.P.: (The influence of isolation and incubation conditions of the nuclei on the digesting of chromatin DNA by Ca, Mg-dependent endonuclease *in situ*). *Biokhimiya*, 41 (1976) 1136-1145 - polyacrylamide gel.

21d. Nucleoproteins

- 5772 Carter, D.B., Efird, P.H. and Chae, Ch.-B.: Chromatin-bound protease: [³H]di-isopropyl fluorophosphate labeling patterns of chromatin. *Biochemistry*, 15 (1976) 2603-2612 - SDS-polyacrylamide gel.

21f. Structural studies on nucleic acids

- 5773 Briand, J.-P., Jonard, G., Guilly, H., Richards, K. and Hirth, L.: Nucleotide sequence (n=159) of the amino acid-accepting 3'-OH extremity of turnip-yellow-mosaic-virus RNA and the last portion of its coat-protein cistron. *Eur. J. Biochem.*, 72 (1977) 453-463 - DEAE-cellulose paper, polyacrylamide gel.
- 5774 Chumakov, K.M. and Agol, V.I.: Poly(C)sequence is located near the 5'-end of encephalomyocarditis virus RNA. *Biochem. Biophys. Res. Commun.*, 71 (1976) 551-557 - polyacrylamide gel.
- 5775 Hofstetter, H., Schmaböck, A., Van den Berg, J. and Weissmann, C.: Specific excision of the inserted DNA segment from hybrid plasmids constructed by the poly(dA) poly(dT) method. *Biochim. Biophys. Acta*, 454 (1976) 587-591 - agarose gel.
- 5776 Kopecka, H., Crouse, E.J. and Stutz, E.: The *Euglena gracilis* chloroplast genome: analysis by restriction enzymes. *Eur. J. Biochem.*, 42 (1977) 525-535 - polyacrylamide gel.
- 5777 Kroon, A.M., Bakker, H., Holotrop, M. and Terpstra, P.: The restriction endonuclease cleavage map of rat liver mitochondrial DNA. *Biochim. Biophys. Acta*, 474 (1977) 61-68 - polyacrylamide gel.
- 5778 Moss, B.: Utilization of the guanylyltransferase and methyltransferases of vaccinia virus to modify and identify the 5'-terminalis of heterologous RNA species. *Biochem. Biophys. Res. Commun.*, 74 (1977) 374-383 - paper.
- 3779 Panet, A., Kleppe, R., Kleppe, K. and Khorana, H.G.: Total synthesis of the structural gene for the precursor of a tyrosine suppressor transfer RNA from *Escherichia coli*. 9. Enzymatic joining of chemically synthesized deoxyribopoly-nucleotide segments corresponding to nucleotide sequence 57-94. *J. Biol. Chem.*, 251 (1976) 651-657 - polyacrylamide gel.

- 5780 Silberklang, M., Prochiantz, A., Haenni, A.-L. and Rajbhandary, U.L.: Studies on the sequence of the 3'-terminal region of turnip-yellow-mosaic-virus RNA. *Eur. J. Biochem.*, 72 (1977) 465-478 - polyacrylamide gel.

25. ORGANIC PHOSPHORUS COMPOUNDS

- 5781 Rae, A.S. and Strickland, K.P.: Studies on phosphate transport in *Escherichia coli*. Effects of metabolic inhibitors and divalent cations. *Biochim. Biophys. Acta*, 433 (1976) 564-582 - paper.

27. VITAMINS AND VARIOUS GROWTH FACTORS

- 5782 Haddad, J.G., Jr. and Walgate, J.: 25-Hydroxyvitamin D transport in human plasma. Isolation and partial characterization of calcifidol binding protein. *J. Biol. Chem.*, 251 (1976) 4803-4809 - polyacrylamide gel.

30. SYNTHETIC AND NATURAL DYES

- 5783 Gamayunov, N.I., Malennikov, B.I. and Shulman, Yu.A.: (Method for determining the ϵ -potential of aqueous suspensions of humic acid). *Biol. Nauki (Moscow)*, 19 (1976) 131-135; *C.A.*, 86 (1977) 15636m.

- 5784 Kitaoka, Y., Yamase, I., Fukumura, T. and Kitao, T.: Electrophoretic behaviour of congo red dyes in aqueous dimethylformamide containing an electrolyte. *J. Chromatogr.*, 132 (1977) 175-177 - Toyo No 55 paper.

- 5785 Yeh, D.-B.: Polyacrylamide gel electrophoresis of water-soluble coal tar dyes. *J. Chromatogr.*, 132 (1977) 566-568 - polyacrylamide gel.

31. PLASTICS AND THEIR INTERMEDIATES

- 5786 Kokufuta, E., Kokubo, S. and Iwai, S.: Electrophoresis and colloid titration of poly(N,N-dimethyldiallyl ammonium chloride). *Nippon Kagaku Kaishi*, 8 (1976) 1335-1337; *C.A.*, 86 (1977) 9018v.

33. INORGANIC SUBSTANCES

- 5787 Koch, S. and Ackermann, G.: (Ternary complexes. 10. Determination of the charge of ternary complexes by paper electrophoresis). *Z. Chem.*, 16 (1976) 237-238; *C.A.*, 85 (1976) 69043p.

- 5788 Kozjak, B., Marinic, Z., Konrad, Z., Musani-Marazovic, L. and Pucar, Z.: Electrophoretic investigations of the complexing of cadmium and zinc with EDTA. *J. Chromatogr.*, 132 (1977) 323-334 - paper.

- 5789 Maslowska, J. and Orzelowski, R.: (Separations of cations of the fourth period transition metals from complexones containing medium by paper ionophoresis). *Chem. Anal. (Warsaw)*, 21 (1976) 219-226; *C.A.*, 85 (1976) 116033x.

34. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 5790 Noble, R.C., Shand, J.H. and West, I.G.: A radiochromatographic scanning procedure for phosphorus-32-labeled compounds. *Lab. Pract.*, 25 (1976) 681-682; *C.A.*, 86 (1977) 13433u.

36. CELLS AND CELLULAR PARTICLES

- 5791 Miskin, R.: A protein factor enhancing activation of inactive 30-S ribosomal subunits of *Escherichia coli*. *Eur. J. Biochem.*, 66 (1976) 57-64 - SDS-polyacrylamide gel.
- 5792 Nakamura, K. and Ashai, T.: Changes in properties of the inner mitochondrial membrane during mitochondrial biogenesis in aging sweet potato tissue slices in relation to the development of cyanide-insensitive respiration. *Arch. Biochem. Biophys.*, 174 (1976) 393-401 - SDS-polyacrylamide gel.
- 5793 Popov, M.P.: (Blood cell microelectrophoresis). *Lab. Delo*, (1976) 520-523; *C.A.*, 85 (1976) 173673e.
- 5794 Tsukagoshi, N., Schäfer, R. and Franklin, R.M.: Structure and synthesis of a lipid-containing bacteriophage. Effects of lipids containing *cis* or *trans* fatty acids on the reconstitution of bacteriophage PM 2. *Eur. J. Biochem.*, 73 (1977) 469-476 - polyacrylamide gel.

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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: G = gas chromatography, C = liquid column chromatography, E = electrophoresis, P = paper chromatography, and T = thin-layer 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 always referred to separately. In the Subject Index, materials and procedures in common use are not quoted as special entries.

Prague (Czechoslovakia)
Brno (Czechoslovakia)

K.MACEK / Z.DEYL/
J.JANÁK

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 - Antimony, *see* Cations, inorganic, analytical group IIb
 - Antimycotics, *see* Fungicides; Antifungal antibiotics
 - Antioxidents and preservatives
 - C: 762, 5125
 - G: 3207, 3208, 4770, 4771
 - T: 839, 1060, 5274, 5450, 5471
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 - G: 4719
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 - G: 208

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 C: 715, 3689, 5144, 5147
 G: 173, 203, 212, 1647, 1650, 1658,
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 4745, 4751
 P: 2394
 T: 843, 1046, 1048, 1056, 1058, 1064,
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T: 1054

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T: 2642, 5398

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T: 4060

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C: 711, 717, 5145, 5149

G: 205, 211, 1677, 1683, 3149, 3154,
 4559, 4682, 4713, 4718, 4723, 4736

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T: 1043, 1047, 1048, 2418, 2671, 2675,
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Berryllium, see Cations, inorganic, analytical group III

Bile acids

C: 450, 1899, 1902

E: 1109, 4202

G: 140, 3071, 4639, 4652

P: 5191, 5192

T: 920, 931, 2510, 5191, 5324

Bile alcohols

G: 1565

T: 2514

Bile pigments

C: 450, 1823, 5129

E: 4465

T: 4030

Biotin group

C: 3655

Biphenyl and derivatives

C: 2288, 2295

G: 81, 115, 4566

T: 1015, 1018, 4071, 4091

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Bitter substances

C: 1907

T: 945, 4142

Boranes and derivatives of boric acid

C: 2276, 3715

G: 229, 230

T: 2612, 4039

Boron derivatives, prepared for GC

G: 147, 1543, 1616, 3080

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Calciferols, see Vitamins, D group

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C: 395-406, 1840-1847, 3339-3344,
 4881-4885

E: 1153, 1154, 4181, 5513, 5514

G: 139, 1535-1541, 1548, 3030-3035,
 4574, 4633, 4648

P: 778-781, 2358-2364, 3746-3755,
 5184-5188

T: 890-892, 2471-2478, 3865-3876,
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T: 2473

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C: 396, 399, 403, 404, 1840-1842, 1859,
 1860, 1878, 3341, 3344, 4881, 4884

G: 238, 1535, 1536, 2980, 3034

P: 779, 3748, 5188, 5279

T: 843, 2473, 3867, 3868, 3873, 5188,
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C: 396, 397

E: 5513

G: 1544, 3030

P: 2359, 2364, 3791

T: 3791, 3874

—, —, microorganisms

C: 1845

G: 1542

P: 780, 833, 2361, 3150

T: 5280

—, —, plants

C: 400, 1868, 1871, 1874, 3340, 3343

G: 1519, 1540, 4621

—, —, food products

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T: 2474

—, —, animal material

C: 398, 406

E: 4181, 4187, 5514

G: 3031-3033, 3035, 3172, 3177, 3183,
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P: 2358, 5184

- T: 2472, 2477, 3872, 3875, 3876
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 E: 1153, 1165
 G: 1541, 1544, 1548, 1703, 3172, 3184
 P: 3751
—, —, alcohols
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—, —, amino sugars
 C: 409, 3352
 E: 1154, 1165
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—, —, anhydro
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 E: 1171, 2748, 4192, 5531
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 4634-4646
 P: 782-785, 2366, 3756-3758
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—, —, simple esters
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 G: 146, 1549, 1558, 1737, 3040, 3049,
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 - T: 980
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 - C: 730-759, 2321-2334, 3708-3720, 5156-5166
 - E: 1399-1402, 2921-2923, 4475-4478, 5787-5789
 - G: 225-237, 1696-1707, 3195-3209, 4761-4767
 - P: 822-829, 2403-2405, 3800-3804, 5221-5226
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- , —, analytical groups I and IIa
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 - C: 290, 329, 733, 736, 739-741, 744, 745, 752, 754, 1784, 2325, 3709, 3714, 3718, 3719
 - E: 1401, 1402, 2922, 2923, 5788, 5789
 - G: 181, 1697, 3202, 3222
 - P: 824, 827, 2404, 3800, 3804, 5225
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- , —, analytical group IIb (As, Mo, Sb, Se, Sn, Tc, Te, V, W)
 - C: 680, 731, 734, 740, 747, 755, 2275, 2324, 3714, 3721, 3726
 - E: 2924
 - G: 180, 228, 237, 1706, 1707, 3202
 - P: 827, 829, 3800, 3804, 5223, 5225
 - T: 1086, 1089, 2706, 4156, 4157, 5483
- , —, analytical group III (Al, Be, Co, Cr, Fe, Ga, Mn, Nb, Ni, Ta, Th, Ti, Zn, Zr)
 - C: 290, 329, 678-681, 731, 733, 736,
- 737, 740-744, 748, 752, 754, 755, 758, 1784, 2324, 2326, 2330-2334, 3300, 3708, 3709, 3714, 3716, 3718-3721, 5112, 5156, 5159, 5161, 5166
- E: 1401, 1402, 2923, 4475, 5788, 5789
- P: 823, 825, 826, 829, 3800, 3802-3804, 5225, 5226
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 - C: 322, 766, 767, 1814, 2343, 4846, 4856, 5172-5175
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 - C: 1890
 - T: 2506, 3906, 3908
- Chalones
 - E: 1405
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 - C: 5148
 - G: 206, 1674, 3117
 - P: 820
 - T: 1049, 2602, 2672, 2695, 4116, 5463
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 - G: 4743
 - T: 1004, 1060, 2626, 2632, 2642
- Chloroplast pigments
 - C: 2297
 - E: 4467
 - P: 2399, 3792
 - T: 915, 1036, 2399, 2660, 2710, 4097, 4098, 4100, 4103, 5437, 5438
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 - C: 438, 1886
 - T: 2529
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 - G: 1657, 3157, 4727
 - T: 4123, 4132, 5453
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 - C: 522, 549-552, 2023-2027, 3441, 3444, 3475-3477, 4854, 4997-5001
 - E: 1246, 1260, 1287-1298, 2793, 2818-2821, 4257, 4299-4308, 5635-5643
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 - C: 1943, 3412, 3418, 4952
 - E: 2772, 4234, 5548, 5551
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 - C: 664, 719
 - P: 2393
 - T: 987, 2597, 2694
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 - C: 292, 360, 406, 409, 414, 415, 417,

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 Cyanides, *see* Halides and other inorganic halogen compounds
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- C: 3741, 1905
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- G: 84, 85, 1475, 1733, 2836, 3001-3003, 4571, 4572

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- G: 1476

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- C: 1740, 3228
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- P: 2345

- T: 2345, 3807

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- G: 1413, 1414, 1720, 1721, 3023, 3124, 3209, 4616

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- C: 566-632, 2057-2243, 3493-3612, 5015-5088
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- C: 1808, 4847, 4852, 4967, 4968, 5155
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- C: 4946, 4947

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- T: 863

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- C: 2305
 G: 200, 1637, 1694, 4646

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- C: 711, 2270
 G: 175
 T: 975, 979, 988, 1043, 2587, 2590, 2591, 2595, 2596, 4010, 4015, 4017, 4018, 5372

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- C: 3379
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 P: 2371
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- C: 442, 3687
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- T: 2664

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- C: 3644, 3645, 3648
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- C: 1835, 3332, 3334, 3700

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- P: 776, 777, 877, 2357, 3742, 3745, 3854

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- C: 688, 3650

- G: 3186

- P: 3783, 5213

- T: 4047

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- C: 2298

- E: 2919

- G: 4621

- P: 2350, 2400

- T: 839, 4096, 4102

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- G: 11, 84, 1477, 3084, 4573

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- G: 1476

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- C: 700

- G: 3211

- T: 1009, 1017, 2657, 5428, 5430

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- G: 1529, 1530, 4626, 4627

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- G: 1489, 3023, 4626

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- C: 410-413, 419, 1785, 1853, 1855, 1857, 1870, 1872, 1873, 3351, 3358, 3359, 4891
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 G: 1494, 1509
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 C: 711-726, 2309-2311, 3697, 5138-5151
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 G: 202-207, 1641-1680, 3133-3147,
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- , reviews and books
 C: 2306-2308, 3234, 3241, 3692-3695
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- , synthetic drugs, general techniques
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- , —, systematic analysis and screen-
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 C: 712
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 P: 821
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- , —, complex mixtures
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- T: 1043, 1065, 1066, 2686, 4120, 5450, 5455, 5460, 5470
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- Pharmaceutical and cosmetic dyes
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 G: 4647, 4648
 P: 786, 787, 5189, 5190
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 C: 1815, 2274, 3640, 5110
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- , applications
 C: 675, 676, 1815
 E: 5781
 G: 3064
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- Pigments, natural (and fluorescent substances)
 C: 459, 704, 1823, 1864
 E: 2746, 5785
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 P: 776, 2402, 3744, 3756
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- Plasticizers and stabilizers
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 G: 1723, 4710, 4711, 4783
 T: 1039, 5387, 5388, 5389, 5448
- Plastics
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- , reviews
 C: 3245
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- , techniques and theory
 C: 705-707, 2299-2301, 2304, 3255, 3296, 3670, 3677, 3681, 3686, 3688, 3691, 5130-5132
 E: 1115
 T: 1041, 4105, 4106, 4109
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- Platinum metals and gold
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 P: 828, 2404, 3801, 3804, 5222, 5223
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- Polyamides and their intermediates
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- Polyethylene glycol and polybutylene glycol
 C: 2303
 T: 2664, 2665
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- Polyethylene and polypropylene, *see*
 Polyolefins
- Polyethylene imine
 C: 2302
- Poly nucleotides, *see* Oligo- and poly-nucleotides
- Polyolefins
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 G: 1637, 3129, 3206, 4787
- Polyoxyethylene
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- Polysaccharides
 C: 1850, 1852, 1858, 1874, 3315, 3347-3349, 3355, 4886, 4893
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 C: 407
- , structure studies
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- Polythionates
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- Polyuretanes
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- Pregnane derivatives
 —, techniques
 C: 443, 444, 447, 448, 1900
 G: 4655
 P: 790
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- , applications, non-biological
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- , biological
 C: 1897, 4903
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 P: 788, 2367, 2518, 3919, 5193, 5194
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- Propellants
 T: 3953
- Prostaglandins
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- T: 902, 2415, 3878, 3880, 3882, 3883, 5286, 5288
- Protamines, histones and other nuclear proteins (including chromatin proteins)
 C: 546, 547, 657, 1800, 1809, 2017-2022, 3467, 3468, 3470-3474, 4995, 4996, 5004
 E: 1278-1286, 1389, 1390, 2811, 2814, 4281-4291, 4293-4298, 5578, 5622-5631, 5633, 5634
- , structure studies
 C: 1956, 4953
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- Proteins
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- , reviews and books
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- , techniques
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- , sequence analysis, general techniques
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- , —, reviews
 C: 1745
 G: 1602
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- , of subcellular particles and viruses (including ribosomal proteins)
 C: 526, 547, 548, 558, 653, 658, 1969, 1976, 1977, 2031, 2050, 2261-2264, 3440, 3445, 3448, 3490
 E: 1136, 1212, 1213, 1223, 1227-1229, 1391, 2779, 2787, 2788, 2790, 2813, 2816, 2817, 2828, 2833, 2834, 2838, 2915, 2916, 2928, 2929, 2931, 4251, 4256, 4257, 4260, 4264, 4270, 4282, 4289, 4292, 4309, 4319, 4322, 4328, 4456, 4457, 4488, 5567, 5570, 5572-5574, 5578, 5580, 5630, 5645, 5657, 5668
- , stucture studies
 C: 3428
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- , microbial and plant proteins (including proteins of foods of plant origin)
 - C: 356, 520, 521, 547, 549, 550, 653, 1967-1970, 1972-1975, 1978-1980, 2040, 3439, 3441-3444, 3446, 4972-4974
 - E: 1222, 1224-1226, 1289, 1296, 2728, 2778, 2781, 2782, 2784-2786, 2789, 2817, 4249, 4250, 4253-4255, 4260-4262, 4287, 4296, 4306, 5568, 5569, 5571, 5575-5577, 5579
- , —, structure studies
 - C: 1946, 3430, 4960
 - E: 5557
 - P: 798, 799, 3775
 - T: 5355
- , bacterial toxins
 - C: 523-525, 1802, 1934, 1971
 - E: 2780, 5581
- , —, structure studies
 - E: 2763
- , insect toxins
 - C: 2041, 2042
- of blood and blood cells
 - C: 364, 527-538, 552, 728, 1813, 1822, 1981-1992, 1994-2005, 3298, 3313, 3321, 3449-3462, 4832, 4849, 4855, 4859, 4901, 4902, 4977-4989
 - E: 1111, 1126, 1147, 1230-1238, 1240-1246, 1249-1260, 1262-1265, 1290, 2724, 2791-2805, 2823, 2825, 2838, 4263-4276, 4295, 4312, 4314, 4325, 4333, 4334, 5509, 5582, 5583, 5585-5589, 5591-5593, 5595-5601, 5662
 - T: 964, 3987
- , —, structure studies
 - C: 510, 511, 1945, 1947, 1948, 1950, 1960, 3411, 3414, 4945, 4954
 - E: 1200, 1202, 1242, 1253, 2764, 2765, 2769, 4215, 5556, 5592
 - P: 2381, 5201
 - T: 962, 2381, 5356
- , structural (except contractile elements)
 - C: 539, 543, 545, 554, 2009-2016, 2035, 2051, 3296, 3463, 3464, 3576, 4991, 4994
 - E: 1267, 1269, 1271, 1273, 1274, 1276, 1316, 2809, 2810, 4279, 4321, 5604, 5605, 5607-5609, 5614-5617
- , —, structure studies
 - C: 512, 1949, 1953, 1963, 2013, 2015, 3423, 3436, 4942, 4956
 - E: 1207, 2773, 4217, 4219, 4230, 4233, 4239, 5605
 - T: 3984
- of brain, cerebrospinal fluid and eyes
 - C: 560, 561, 2048, 2052, 3469, 3480, 5003, 5008
 - E: 1305, 1308, 1312, 1317, 1320, 2812, 2832, 2837, 4309, 4311, 4316, 4317, 4319, 4331, 5632, 5646, 5647, 5649, 5650, 5652, 5653, 5655, 5656, 5659, 5663
- , —, structure studies
 - C: 3405
 - E: 2766, 4204, 5562, 5563
 - P: 2380
- of muscle and meat products and related contractile proteins
 - C: 357, 540-542, 544, 2007, 2008, 3465, 3466, 4992, 4993
 - E: 1266, 1268, 1270, 1272, 1275, 1277, 1306, 1319, 2806-2808, 4277, 4278, 4280, 4355, 5602, 5603, 5606, 5610, 5611-5613, 5618-5621
 - T: 963
- , —, reviews
 - C: 254
- , —, structure studies
 - C: 357, 1944, 1947, 3401, 3404, 3408, 3417, 3437, 4961
 - E: 2774, 4214, 4215, 4231, 4232, 4238, 5547, 5549, 5550, 5558
- of glands and gland products (except mammary gland)
 - C: 622, 3479
 - E: 1303, 1307, 1309, 1314, 1365, 4305, 4318, 4324, 4398, 5511
- of milk
 - C: 555, 4854, 4858
 - E: 1311, 2822, 2836, 4172
- , —, structure studies
 - E: 1198, 1206
- of eggs
 - C: 3485
- , urinary
 - C: 622, 3484
 - E: 1304, 4333, 4470, 4472, 4474, 5511
- from neoplastic tissues
 - C: 1966, 4853
 - E: 1301, 4291
- , complex mixtures and uncompletely specified proteins
 - C: 360, 554, 558, 564, 565, 655, 764, 2035, 2037, 2044, 2045, 2049, 3399, 3482, 3491, 4845, 5009-5011, 5013
 - E: 1134, 1248, 1300, 1306, 1310, 1313, 4259, 4323, 4325, 4326, 4327, 4335, 4479, 5644, 5658, 5661, 5662, 5664, 5666, 5667
 - T: 5357
- , —, structure studies
 - C: 502, 3420
 - E: 1197, 1209, 2775, 4226, 5554
 - T: 2562
- conjugates (with nucleic acids)
 - C: 5091
 - E: 1299, 1388-1391, 2794, 2811, 2815, 2913-2915, 4291, 4315, 4455-4457
- Protobberberine alkaloids
 - G: 1606
 - E: 4469
- Psychotropic drugs (analeptics, stimulants, antidepressants)
 - C: 385, 719, 3362, 5143, 5150
 - G: 216, 222, 1415, 1645, 1649, 1652, 1653, 1655, 1671, 1672, 1675, 3138, 3148, 3155, 3164, 3187, 4665, 4714,

- 4715, 4724, 4725, 4728, 4737-4741,
4747, 4750, 4755
- T: 1045, 1053, 1061, 1077, 2678, 2692,
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4135, 4137, 4139, 4141, 5219, 5220,
5459, 5465, 5477, 5479, 5481
See also Hallucinogens
- Purine alkaloids, *see Xanthine alkaloids*
- Purine antibiotics
- E: 2918
 - P: 5397
 - T: 2625, 5397
- Purines, pyrimidines, nucleosides,
nucleotides
- , reviews
 - C: 2251
 - , general techniques
 - C: 633, 635, 638, 640, 641, 2244-2248,
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 - G: 171, 1603-1605, 1607, 3094, 4677,
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 - P: 773, 2569
 - T: 2568, 2569, 2571, 2581, 3989, 3991,
3993, 4000, 5359, 5360, 5364, 5366
 - , applications, non-biological
 - C: 5092
 - G: 172
 - P: 805, 2383-2385, 2388, 2392, 3776-
3778, 5202, 5206, 5365
 - T: 2383, 2388, 2392, 2586, 2717, 3995,
3998, 4001, 5362, 5365
 - , —, —, analogues of purines, pyri-
midines, nucleosides, nucleotides
 - C: 3619, 3631, 3633, 5089, 5094, 5097
 - P: 800, 801, 805, 806, 2384, 2386, 2389
 - T: 801, 970, 2386, 2389, 2570, 2575,
2582, 3998, 3999
 - , —, enzymatic
 - C: 637, 641, 675, 3614
 - E: 1370, 2904
 - P: 803, 806, 2576, 5205
 - T: 2567, 2575-2579, 3992, 3996, 5205
 - , —, microorganisms
 - C: 636, 3617, 5090
 - E: 5781
 - P: 800, 2391, 3994, 5203
 - T: 966, 973, 974, 3994, 3997, 5367
 - , —, plants
 - C: 644
 - P: 802
 - , —, animal material
 - C: 642, 643, 2245, 5093
 - E: 5531
 - P: 2387, 5207
 - T: 969, 2566, 2574, 2582, 3988, 3990

Pyran derivatives

 - T: 3885

Pyrazole and pyrazoline derivatives

 - G: 3047
 - T: 2605

Pyrazolone derivatives

 - T: 3811
 - See also Antipyretics etc.*

Pyrethrins

 - C: 762
 - T: 5418

Pyridine and piperidine derivatives

 - C: 3271
 - G: 102, 249, 1452, 1586, 2990, 3097,
4593
 - P: 810, 2347, 3741
 - T: 2603, 5376, 5379
 - , carboxylic acids
 - P: 810
 - T: 997
 - See also Nicotinic acid and deriva-
tives*

Pyridoxine, *see Vitamins, B₆ group*

Pyrimidines, *see Purines, pyrimidines,*
nucleosides, nucleotides

γ-Pyrone derivatives, *see Flavonoids*
and other γ-pyrone derivatives

Pyrroles

 - T: 2601
 - See also Bile pigments; Porphyrins*
and metalloporphyrins

Pyrrolidines

 - G: 3077

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Quinoline (and isoquinoline) derivatives

 - G: 1608, 1626, 4771
 - P: 2347, 2349, 3741, 5178
 - T: 2421, 2422, 2435, 2446, 5238, 5239,
5458

Quinones

 - C: 4880
 - G: 1712, 4580, 4684
 - T: 888, 2468, 3862, 3950, 4033
 - See also Anthraquinones*

R

Radiopharmaceuticals

 - P: 2409, 5216, 5227

Rare earths

 - C: 749, 750, 752, 754, 760, 1784,
2329, 3273, 3721, 3724, 3725, 5160,
5165, 5167
 - E: 4477
 - G: 184
 - P: 3804
 - T: 1086, 4150, 5485, 5490

Rauwolfia alkaloids

 - T: 4005

Resins

 - , phenol-formaldehyde
 - T: 5447
 - , phenolic
 - G: 1526
 - , polyester
 - C: 3687
 - T: 4109
 - , poly(vinyl alcohol)
 - C: 3296

- , poly(vinyl chloride)
 - C: 5134
 - See also* Acrylic resins; Styrene polymers
 - Retinol and derivatives, *see* Vitamins, A group
 - Riboflavin and other flavins, *see* Vitamins, B₂ and other flavins
 - RNA
 - , techniques
 - C: 645, 649, 652, 1774, 1818, 2251, 3298, 4840
 - E: 1371, 1377, 2905, 2911, 4446, 5767
 - , applications, non-biological
 - C: 649, 2256, 3620
 - E: 1375, 1376, 2912
 - , —, microorganisms
 - C: 646, 650, 3409, 3623, 5098
 - E: 1380, 2907, 2908, 2910, 4449, 5757, 5759, 5761, 5766
 - , —, plants
 - C: 2252, 2253, 3625
 - E: 1373, 1379, 4450, 5759, 5762
 - , —, animal material
 - C: 647, 648, 651, 2254, 3621, 3622, 3624, 4848, 5099, 5100, 5102
 - E: 1372, 1374, 1378, 1381, 2906, 2909, 2912, 4442-4445, 4447, 4448, 4451, 5756, 5758, 5760, 5763-5765, 5767
 - , complex mixtures of RNA, DNA and RNA-DNA hybrids
 - C: 3628
 - , structure studies
 - C: 659, 2249, 2254, 2265, 2267, 3629, 3631-3633, 5101-5106
 - E: 1204, 1205, 4458, 4459, 4462, 5773, 5774, 5778-5780
 - G: 1604, 1605
 - P: 807, 965, 2390, 5204
 - T: 965, 967, 968, 971, 972, 2572, 2583, 2585, 5361
 - Rubber (natural and synthetic)
 - C: 706, 710
 - G: 198, 1577, 1634, 1636, 4782
 - T: 2663, 4110
 - Rubidium, *see* Alkali metals
- S**
- Saponins and sapogenins
 - G: 4656
 - P: 939
 - T: 939, 941, 4145, 5328
 - Sedatives, hypnotics and narcotics
 - C: 714
 - G: 1643, 1654, 1661, 1688, 3135, 3139, 4752, 4753
 - T: 2690, 4129, 4136
 - See also* Barbiturates
 - Selenium, inorganic, *see* Cations, inorganic, analytical group IIb
 - , organic
 - C: 672, 673, 2273
 - G: 180, 2956
 - Sexual attractants
 - C: 2342
 - Sialic acids, *see* Glycosaminoglycans
 - Silanols
 - C: 3642
 - Silicone compounds, organic
 - G: 232, 1477, 3104, 4583, 4709
 - T: 2612
 - , derivatives prepared for GC analysis
 - G: 135, 141, 150, 158, 166, 171, 173, 618, 1477, 1538, 1540, 1543, 1545, 1552, 1554, 1560, 1593-1595, 1603, 2980, 3026, 3030, 3038, 3043, 3048, 3059, 3086, 3088, 3089, 4574, 4621, 4633, 4643, 4650, 4653, 4654, 4660, 4678, 4680
 - Siloxanes
 - C: 3642, 3647
 - G: 199, 1617, 3105, 3106, 4521, 4689
 - Silver, *see* Cations, inorganic, analytical groups I and IIa
 - Skeletal muscle relaxants
 - G: 1659, 4734
 - Snake venoms
 - C: 2054, 2198
 - E: 2827, 5651
 - , structure studies
 - C: 509, 1962, 3400, 3406
 - E: 4213, 4218, 4221
 - P: 3774
 - Sodium, *see* Alkali metals
 - Soil pollution
 - C: 1736, 3228
 - G: 1706, 3211, 4700
 - P: 3736
 - T: 2417, 5428
 - Spasmytics, *see* Anticonvulsants
 - Specific binding proteins
 - C: 556, 557, 559, 560, 562, 563, 657, 1978, 1989, 1993, 1995, 2006, 2028-2030, 2032-2034, 2036, 2040, 2043, 2046, 2047, 2053, 2055, 2056, 3439, 3447, 3478, 3481, 3484, 3487, 3488, 4835, 4976, 5012, 5014
 - E: 1247, 1260, 1261, 1299, 1315, 1318, 2783, 2784, 2814, 2824, 2829-2831, 2835, 4223, 4261, 4265, 4271, 4312, 4315, 4329, 4330, 4332, 5551, 5584, 5590, 5594, 5648, 5654, 5659, 5660, 5663
 - , structure studies
 - T: 2555
 - Sphingolipids
 - C: 1885, 1890, 1895, 3371, 3374, 4897
 - E: 5532, 5533
 - G: 147, 3080, 4648
 - P: 3890
 - T: 2506, 3890, 3892, 3894, 3904, 3906, 3908
 - See also* Cerebrosides; Glycolipids
 - Stabilizers, *see* Plasticizers and stabilizers
 - Starch components
 - C: 414, 709, 727, 3298, 4894

- G: 1537
 T: 3870
- Steroid alkaloids**
 C: 661
 T: 3942, 4002, 4022
- Steroids**
 C: 443-450, 1896-1905, 3376, 4903-4907
 E: 1183, 4202
 G: 148-152, 1563-1570, 1695, 3058-3071, 4574, 4650-4655
 P: 788-790, 2367-2370, 3761, 5191-5195
 T: 920-938, 2509-2519, 3912-3936, 5316-5326
 —, reviews and books
 C: 1898
 P: 789, 2415
 T: 789, 2415, 5320
 —, general techniques
 C: 426, 1896, 4906, 4907
 G: 149-152, 1563, 2967, 3000, 3059, 3064, 3211, 4549, 4653, 4654
 T: 843, 924, 927, 933, 2443, 3931
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- Sterols**
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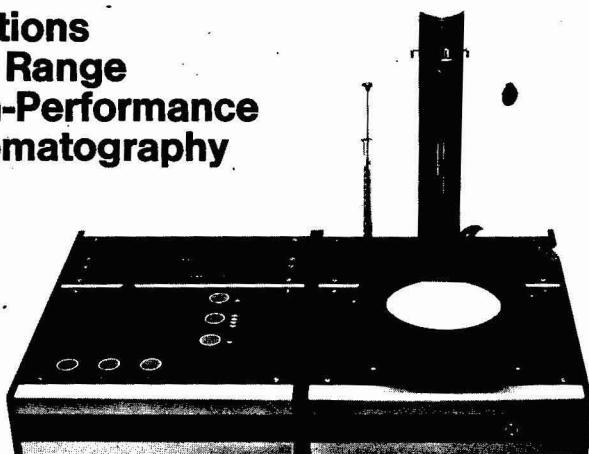
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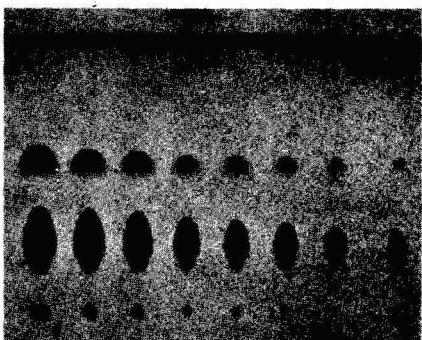
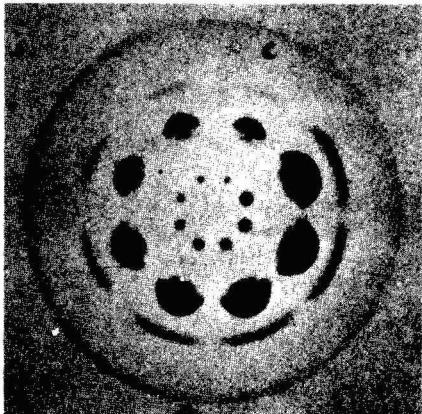


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