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CONTENTS

Bibliography Section

Liquid Column Chromatography	B433
Gas Chromatography	B564
Planar Chromatography	B612
Electrophoresis	B640

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Chemometrics: a textbook

D.L. Massart, *Vrije Universiteit Brussel, Belgium*,

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S.N. Deming, *Dept. of Chemistry, University of Houston, TX, USA*,

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3. GENERAL TECHNIQUES

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65153u, 74435g, 78177e, 78180a, 94337n, 97744d,
104325y, 135251a, 160121r, 165873x, 167162p, 177691z,
181722c.

See also 2799, 2800, 2820, 2827, 3024, 3028, 3036, 3041, 3042, 3073,
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3638, 3639, 3680, 3693, 3718, 3843, 3854, 3924, 3955, 3972,
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5. HYDROCARBONS AND HALOGEN DERIVATIVES

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See also 2827, 2879, 3872, 4278, 4386, 4587.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

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see also 2850, 2979, 3035, 3415, 3423, 3446.

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18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

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C.A., 114 (1991) 20584u, 58486b, 117917t, 135381t.

See also 2821, 2940, 2962, 3035, 3043, 3044, 3387, 3396, 3514, 3521, 3524, 3611, 3644, 3767, 3773, 3832, 3979, 4132, 4137, 4241, 4357, 4541, 4581.

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18c. *Elucidation of structure of proteins and enzymes*

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19. PROTEINS

19a. General techniques

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21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

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21e. Structural studies on DNA and DNA mapping

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See 2913.

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See also 4341, 4414, 4423, 4428, 4530.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23a. Porphyrins and other pyrroles

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C.A., 114 (1991) 60544n, 69154t, 80159u, 120442q, 129217c, 135388a, 160129z, 171428x.

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32. DRUG ANALYSIS

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Gas Chromatography

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3. GENERAL TECHNIQUES

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20. ENZYMES AND ENZYME ACTIVITY ESTIMATION

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See 1654.

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See also 1324, 1367, 1432, 1501, 1524, 1884.

32. DRUG ANALYSIS

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32e. Chemotherapeutics (exc. cytostatics and antibiotics)

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See also 1462, 1472, 1510, 1536, 1634, 1692.

32i. Plant extracts

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See also 1607, 1644.

33. CLINICO-CHEMICAL APPLICATIONS

33a. General papers and reviews

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33b. Complex mixtures and profiling (single compounds by cross-reference only)

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34. FOOD ANALYSIS

34b. Complex mixtures (single compounds by cross-reference only)

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34c. *Organoleptically important compounds (flavors, odors, volatiles)*

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35. ENVIRONMENTAL ANALYSIS

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- 1839 Zojer, K.: (Analytical methods for some toxic organic pollutants in water, wastewater, and sediment.) *Wasser Abwasser (Vienna)*, 33 (1989) 385-396; *C.A.*, 114 (1991) 94425q.

See also 1479, 1532, 1852.

35b. *Air pollution (complex mixtures; single compounds by cross-reference only)*

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See 1514.

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Planar Chromatography

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See 644, 858, 914.

2d. Measurement of physico-chemical and related values

See 645, 897.

3. GENERAL TECHNIQUES

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See also 648.

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See also 686.

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See also 641, 654, 829, 862.

4h. Other special techniques

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See also 667.

5d. Complex hydrocarbon mixtures (incl. analysis of tars, bitumens and mineral oils)

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See also 843.

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See 938.

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5. HYDROCARBONS AND HALOGEN DERIVATIVES

5b. Cyclic hydrocarbons

See 1308.

7. PHENOLS

See 1227.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

8c. Other compounds with heterocyclic oxygen (incl. tannins)

See 1250.

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20. ENZYMES AND ENZYME ACTIVITY ESTIMATION

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21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

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See also 1316.

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See also 1221.

28. ANTIBIOTICS

See 1202.

29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS

29g. Other types of pesticides and various agrochemicals

1885 Dombek, V.: Determination of permethrine and tetramethrine by isotachophoretic analysis of hydrolytic products. *J. Chromatogr.*, 545 (1991) 427-435.

30. SYNTHETIC AND NATURAL DYES

30a. Synthetic dyes

1886 Karovicova, J., Polonsky, J., Pribela, A. and Simko, P.: Isotachophoresis of some synthetic colorants in foods. *J. Chromatogr.*, 545 (1991) 413-419.

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31. PLASTICS AND THEIR INTERMEDIATES

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See also 1908.

32. DRUG ANALYSIS

32a. Drug analysis, general techniques

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See 1233.

32c. Autonomic and cardiovascular drugs

1894 Fanali, S.: Use of cyclodextrins in capillary zone electrophoresis. Resolution of terbutaline and propranolol enantiomers. *J. Chromatogr.*, 545 (1991) 437-444.

32d. Central nervous system drugs

1895 Thormann, W., Meier, P., Marcolli, C. and Binder, F.: Analysis of barbiturates in human serum and urine by high-performance capillary electrophoresis-micellar electrokinetic capillary chromatography with on-column multi-wavelength detection. *J. Chromatogr.*, 545 (1991) 445-460.

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1896 Krivankova, L., Foret, F. and Bocek, P.: Determination of halofuginone in feedstuffs by the combination of capillary isotachopheresis and capillary zone electrophoresis in a column-switching system. *J. Chromatogr.*, 545 (1991) 307-313.

See also 1742.

32g. Other drug categories

See 1202.

32h. Toxicological and forensic applications

See 1842, 1844, 1870, 1895.

32i. Plant extracts

See 1240.

33. CLINICO-CHEMICAL APPLICATIONS

33b. Complex mixtures and profiling (single compounds by cross-reference only)

1897 Guzman, N.A., Berck, C.M., Hernandez, L. and Advis, J.P.: Capillary electrophoresis as a diagnostic tool: determination of biological constituents present in urine of normal and pathological individuals. *J. Liq. Chromatogr.*, 13 (1990) 3833-3848.

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34. FOOD ANALYSIS

34b. *Complex mixtures (single compounds by cross-reference only)*

See 1268, 1886, 1896.

35. ENVIRONMENTAL ANALYSIS

35c. *Water pollution (complex mixtures; single compounds by cross-reference only)*

1899 Wang, B., Liu, L., Zheng, S. and Zhang, Z.: (Electrophoretic properties of suspended particles in natural water. Part III. Effect of metal ion and metal ion-organic matter on electrophoretic properties of suspended particles). *Haiyang Xuebao (Zhongwenban)*, 12 (1990) 441-446; *C.A.*, 114 (1991) 170687u.

36. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

36c. *Complex mixtures, technical products and unidentified compounds*

1900 Mc Cormick, R.M.: Characterization of silica sols using capillary zone electrophoresis. *J. Liq. Chromatogr.*, 14 (1991) 939-952.

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See also 1826.

38. INORGANIC COMPOUNDS

38a. Cations

- 1910 Misra, A.K.: Separation of palladium from several other metal ions, and its determination in mixtures, by electrochromatography on cerium(IV) tungstate papers. *J. Planar Chromatogr.*, 4 (1991) 58-62.
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38b. Anions

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39. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

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Unlike most current textbooks, this book approaches experimental design from the viewpoint of the experimenter rather than that of the statistician. It adopts a practical approach to experimental design and allows the reader to obtain the required information in the minimum number of experiments. It introduces the fundamentals of experimental design. Systems theory, response surface concepts, and basic statistics serve as a basis for the further development of matrix least squares and hypothesis testing. The effects of different experimental designs and models on the variance-covariance matrix and on the analysis of variance (ANOVA) are extensively discussed. Applications and advanced topics complete the text. Numerous worked examples are given.

The clear, practical approach adopted by the authors makes the book applicable to a wide audience. It will appeal particularly to those with a practical need

(scientists, engineers, managers, research workers) who have completed their formal education but who still need to know efficient ways of carrying out experiments. It will also be an ideal text for advanced undergraduate and graduate students following courses in chemometrics, data acquisition and treatment, and design of experiments.

Contents: 1. System Theory. 2. Response Surfaces. 3. Basic Statistics. 4. One Experiment. 5. Two Experiments. 6. Hypothesis Testing. 7. The Variance-Covariance Matrix. 8. Three Experiments. 9. Analysis of Variance (ANOVA) for Linear Models. 10. A Ten-Experiment Example. 11. Approximating a Region of a Multi-factor Response Surface. 12. Additional Multifactor Concepts and Experimental Designs. Appendices: Matrix Algebra. Critical Values of t . Critical Values of F , $\{\alpha\} = 0.05$. Index.

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