

Bibliography Section

Paper Chromatography

1. REVIEWS AND BOOKS

HEFTMANN, E.: Chromatography. *Anal. Chem.*, 36 (1964) 14R-35R — a review of papers on paper, column and thin-layer chromatography published in 1961-1963; 1766 references.

2. FUNDAMENTALS, THEORY AND GENERAL

MICHAL, J. AND ACKERMANN, G.: Zur Entmischung der Lösungsmittel bei der chromatographischen Trennung. I. Selektive Sorption des Flüssmittels auf Cellulose und Entstehung der 2. Front in der Papierchromatographie. *Talanta*, 11 (1964) 441-449.

MICHAL, J. AND ACKERMANN, G.: Zur Entmischung der Lösungsmittel bei der chromatographischen Trennung. II. Selektive Sorption der Mischungen Alkohol-Wasser und Alkohol-Wasser-Säure an der Cellulosesäule. *Talanta*, 11 (1964) 451-459.

PEJŠA, K., DOBÍHALOVÁ, L., FIDLER, Z. AND DVOŘÁK, J.: Countercurrent electrophoresis on paper. IX. Comparison of electrophoretic, chromatographic and static distribution isotherms. *J. Chromatog.*, 14 (1964) 464-468.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

DENTI, E., LUBOZ, M. P. AND MASSAGLIA, A.: Paper chromatography of polyphenyls. Quantitative determination of diphenyl in the presence of polyphenyls. *J. Chromatog.*, 14 (1964) 539-542 — in the form of sulphonation products.

MUKAI, M., TEBBENS, B. D. AND THOMAS, J.: Multidimensional chromatography of arenes produced during combustion. *Anal. Chem.*, 36 (1964) 1126-1130.

6. ALCOHOLS

BURGOS, J., HEMMING, F. W., PENNOCK, J. F. AND MORTON, R. A.: Dolichol: a naturally-occurring C₁₀₀ isoprenoid alcohol. *Biochem. J.*, 88 (1963) 470-482.

TUSTANOWSKI, S., NOWICKI, R., NOWICKA, I. AND ZIELINSKI, A. Z.: (Detection of diglycerol in the presence of glycerol by paper chromatography). *Chem. Anal. (Warsaw)*, 9 (1964) 623-624.

ULBRICH, V. AND DLASK, V.: Identifizierung von Glycidyläthern. Trennung und Identifizierung von α-Alkyl(aryl)-äthern des Glycerins mit Hilfe der Papierchromatographie. *J. Chromatog.*, 14 (1964) 432-438.

7. PHENOLS

ERNST, W. AND BÄR, F.: Die Umwandlung des 2,4-Dinitro-6-sec.-butylphenols und seiner Ester im tierischen Organismus. *Arzneimittel-Forsch.*, 14 (1964) 81-84.

GUMPRECHT, D. L.: Paper chromatography of phenylphenols. *Anal. Chem.*, 36 (1964) 1154-1155.

ZWIMPFER, G. AND BUCHI, J.: Die papierchromatographische Prüfung der Filix-Phlorglucide und der Rohfiliicine. *Pharm. Acta Helv.*, 39 (1964) 327-336.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

DI MODICA, G. AND TIRA, S.: (Chromatographic comparison of flavonoid pigments from *Inulae*). *Ann. Chim. (Rome)*, 53 (1963) 764-773; *C.A.*, 59 (1963) 11885b.

9. OXO COMPOUNDS

BURTON, J. S. AND STEVENS, R.: Chemistry of hop constituents. XVIII. Hulupinic acid. *J. Chem. Soc.*, (1964) 952-955 — Whatman No. DE-20 paper.

FORSS, D. A. AND STARK, W.: Paper chromatography of the 2,4-dinitrophenylhydrazones of alk-1-en-3-ones. *Anal. Chem.*, 36 (1964) 941-942.

KHORANA, M. L. AND SANGHAVI, M. M.: Two new glucosides from *Cassia angustifolia* pods. *J. Pharm. Sci.*, 53 (1964) 110-112.

- LEMLI, J., DEQUEKER, R. AND CUVEELE, J.: (Anthraquinone drugs. I. The presence of dianthrone in rhubarb root). *Pharm. Weekblad*, 98 (1963) 500-502; *C.A.*, 59 (1963) 9085f.
 LEMLI, J., DEQUEKER, R. AND CUVEELE, J.: (Anthraquinone drugs II. The presence of rheindianthrone in the roots of *Rheum palmatum*). *Pharm. Weekblad*, 98 (1963) 529-533; *C.A.*, 59 (1963) 9085g.
 POHLOUDEK-FABINI, R. AND GÖTZKERITZ, D.: (Papierchromatographisch-spektrophotometrische Bestimmung von Carvon als Reinsubstanz oder in ätherischen Ölen). *Nahrung*, 7 (1963) 122-138; from *Z. Anal. Chem.*, 202 (1964) 385.
 POLACZEK, L., KUSZCZAK, H. AND FISCHHOF, K.: (Method of determination of ethyl flavono-7-hydroxyacetate ("Recordil") and some possible impurities from its synthesis). *Chem. Anal. (Warsaw)*, 9 (1964) 275-281.

10. CARBOHYDRATES

- BERTONE, E.: (Determination of sugars in urine by the method of paper chromatography). *Minerva Med.*, 54 (1963) 975-981; *C.A.*, 59 (1963) 11866b.
 BIHARI-VARGA, M.: A method for the chromatographic determination of carbohydrates. *Acta Chim. Acad. Sci. Hung.*, 38 (1963) 55-56; *C.A.*, 59 (1963) 15584b — spraying with CuSO_4 , cutting out and iodometric estimation.
 BRDARIC, R., MIHOLJCIC, M. AND JADRIC, S.: (Paper chromatography of products formed by the action of salivary and pancreatic amylase of albino rats on starch). *Arch. Farm. (Belgrade)*, 13, No. 2 (1963) 93-97; *C.A.*, 59 (1963) 11811g.
 EGOROVA, V. D.: (The determination of monosaccharides in bacterial cells by paper chromatography). *Lab. Delo*, 9, No. 4 (1963) 42-44; *C.A.*, 59 (1963) 11865h.
 ELDREDGE, N. T., READ, G. AND CUTTING, W.: Sialic acids in the brain and tissues of various animals. *Med. Exptl.*, 8 (1963) 265-277; *C.A.*, 59 (1963) 15670g.
 MUKERJEE, H. AND SRI RAM, J.: A new solvent system for paper chromatographic separation of glucuronic and galacturonic acids. *J. Chromatog.*, 14 (1964) 551-552.
 PALLAVICINI, J. C., GABRIEL, O., DI SANT'AGNESE, P. A. AND BUSKIRK, E. R.: Isolation and characterization of carbohydrate-protein complexes from human sweat. *Ann. N.Y. Acad. Sci.*, 106, Art. 2 (1963) 330-338; *C.A.*, 59 (1963) 9161c.
 ROBYT, J. AND FRENCH, D.: Purification and action pattern of an amylase from *Bacillus polymyxa*. *Arch. Biochem. Biophys.*, 104 (1964) 338-345.
 RUKHLYADEVA, A. P., SEMIKINA, L. V. AND CHEREDNICHENKO, V. S.: (Quantitative chromatographic determination of carbohydrates). *Tr. Tsentr. Nauchn.-Issled. Inst. Speriment. i Likero-Vodochn. Prom.*, No. 13 (1962) 14-18; *C.A.*, 59 (1963) 9066e — determination with anthrone reagent after elution.
 UENO, T.: Semichemical soy sauce. VI. Identification and determination of sugars by multiple paper chromatography. *Nippon Nogeikagaku Kaishi*, 34 (1960) 1039-1042; *C.A.*, 59 (1963) 9246f.

11. ORGANIC ACIDS AND SIMPLE LIPIDS

- ALEXANDROWICZ, J.: (Determination of lower (C_1-C_6) and higher (C_8-C_{18}) fatty acids in culture fluids of anaerobically growing sporogenous *Clostridium*). *Med. Doswiadczenia Mikrobiol.*, 15 (1963) 149-158; *C.A.*, 59 (1963) 9102c.
 APARICIO, M.: (Separation of the glycerides by fractional crystallization and paper chromatography in order to characterize butter). *Proc. 16th Intern. Dairy Congr., Copenhagen, 1962, Sect. B*, pp. 5-10; *C.A.*, 59 (1963) 15860a.
 BAJOR, G. F. AND CLARK, W. G.: Ion-exchange resin paper for separation of the acidic urinary metabolites norepinephrine-2- ^{14}C in human subjects. *J. Chromatog.*, 14 (1964) 447-450 — Dowex-I impregnated paper.
 GARCIA FERNANDEZ, J. C. AND LANUCARA, E. N.: (Chromatographic technique for the investigation of monochloroacetic acid in wines and ciders). *Rev. Asoc. Bioquim. Arg.*, 28 (1962) 179-182; *C.A.*, 59 (1963) 12129c.
 GNEDKOV, P. A.: (Chromatographic investigation of organic acids in extracts of Crassulaceae). *Farmatsvet. Zh. (Kiev)*, 18 (1963) 27-31; *C.A.*, 59 (1963) 14292c.
 KAZANSKAYA, L. N. AND BEZRUCHENKO, L. P.: (Identification of non-volatile organic acids in bread baking products by chromatography). *Khlebopekar. i Konditer. Prom.*, 7, No. 7 (1963) 10-14; *C.A.*, 59 (1963) 12085e.
 KIRCHMEIER, O.: (Paper-chromatographic determination of the quality of silages). *Z. Tierphysiol., Tierernaehr. Futtermittelk.*, 18 (1963) 111-114; *C.A.*, 59 (1963) 15866d.
 SAVORY, E.: The detection of carboxylic acids on paper chromatograms by means of the dimethylglyoxime-nickel biuret reaction. *J. Chromatog.*, 14 (1964) 549-550.
 UDAGAWA, K. AND KINOSHITA, S.: A colorimetric determination of gibberellin A₃. II. Specificity of the determination. *Nippon Nogeikagaku Kaishi*, 35 (1961) 224-228; *C.A.*, 59 (1963) 14505c.

WEBER, M. A., HOAGLAND, A. N., KLEIN, J. AND LEWIS, K.: Biosynthesis of α -keto adipic acid by extracts of baker's yeast. *Arch. Biochem. Biophys.*, 104 (1964) 257-266.

13. STEROIDS

- GOWER, D. B.: Chromatographic separation of C₁₉-16-dehydro-steroids. *J. Chromatog.*, 14 (1964) 424-431 — silica gel thin layer and silicic acid impregnated paper.
- HELLSTRÖM, K. AND LINDSTEDT, S.: Cholic-acid turnover and biliary bile-acid composition in humans with abnormal thyroid function. *J. Lab. Clin. Med.*, 63 (1964) 666-679.
- KECSKES, L., MUTSCHLER, F., THAN, E. AND FARKAS, I.: (The isolation of estrone, 17-estradiol and estriol from human ovaries by paper chromatography). *Acta Endocrinol.*, 39 (1962) 483-490; *C.A.*, 59 (1963) 9034h.
- KORNEL, L.: A new method for elution of conjugated steroids from paper strips. *Anal. Chem.*, 36 (1964) 443-444.
- KUSHINSKI, S. AND DEMETRIOU, J. A.: Analysis of urinary metabolites of 17 β -estradiol-4-C¹⁴. A rapid paper chromatographic method for obtaining a profile of urinary metabolites. *Steroids*, 2 (1963) 253-270; *C.A.*, 59 (1963) 15557c — R_F values of 32 oestrogens.
- MAHESH, V. B. AND HERRMANN, W.: Isolation of estrone and 11-hydroxyestrone from a feminizing adrenal carcinoma. *Steroids*, 1 (1963) 51-61; *C.A.*, 59 (1963) 9035c.
- STÁRKA, L. AND HAMPL, R.: Die Isolation des 7 α -Hydroxydehydroepiandrosteronsulfates aus dem menschlichen Plasma. *Naturwiss.*, 51 (1964) 164.
- TALMAGE, J. M., PENNER, M. H. AND GELLER, M.: Quingestrone — determination of minute quantities of decomposition products by paper chromatography. *J. Pharm. Sci.*, 53 (1964) 76-79.
- TAMM, J., VOIGT, K. D. AND VOLKWEIN, U.: Water-soluble steroid conjugates. I. Extraction, separation and estimation. *Steroids*, 2 (1963) 271-277; *C.A.*, 59 (1963) 15558d — R_F and ΔR_{MS} values of 15 substances.

14. STEROID GLYCOSIDES

- KRASSO, A. F., WEISS, E. AND REICHSTEIN, T.: Die Cardenolide von *Beaumontia grandiflora* Wallich. *Pharm. Acta Helv.*, 39 (1964) 168-179.

15. TERPENE DERIVATIVES

- RICHTER, G. AND MUSCHOLL, P.: Papierchromatographie ätherischer Öle. I. Ein neues Verfahren zur direkten papierchromatographischen Trennung ätherischer Öle auf imprägniertem Papier. *J. Chromatog.*, 14 (1964) 439-446 — advantages of paraformaldehyde-treated paper are stressed.

16. NITRO AND NITROSO COMPOUNDS

- WAGNER, G. AND PISCHEL, H.: Über Synthese und Spaltung von Nitromercaptopyridin- und Nitromercaptobenzol-S-glucosiden. *Pharmazie*, 19 (1964) 197-200.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

- LEPPANEN, V. V. E. AND OKA, M.: Metabolism of tryptophan in cancer of various sites. *Ann. Med. Exptl. Biol. Fenniae (Helsinki)*, 41 (1963) 123-137; *C.A.*, 59 (1963) 14405e.
- OATES, J. A., NIRENBERG, P. Z., JEPSON, J. B., SJOERDSMA, A. AND UDENFRIEND, S.: Conversion of phenylalanine to phenethylamine in patients with phenylketonuria. *Proc. Soc. Exptl. Biol. Med.*, 112 (1963) 1078-1081.
- OHKUMA, S. AND NIINUMA, K.: Chromatographic detection of spermine and choline in human semen. *Proc. Japan Acad.*, 39 (1963) 136-140; *C.A.*, 59 (1963) 11866e.
- ROBERTS, D. J.: Some possible causes of pharmacological activity in blank eluates following the separation of sympathomimetic catecholamines by paper chromatography. *J. Pharm. Pharmacol.*, 16 (1964) 313-322.

18. AMINO ACIDS

- BARUA, R. K. AND BHUYAN, K.: Identification of S-methylcysteine sulfoxide by paper chromatography, in the presence of other sulfur-containing amino acids. *Current Sci. (India)*, 32 (1963) 353-354; *C.A.*, 59 (1963) 15583d.
- DE LUCA, F., PINCHERA, A., DELLABARBA, D., MENZIGER, G., DI GIROLAMO, M. AND CRAMAROSSA, L.: (Chromatographic study of thyroid hormones in plasma, urine and faeces in man after ¹³¹I administration). *Folia Endocrinol. (Pisa)*, 15 (1962) 786-803; *C.A.*, 59 (1963) 9036h.

- HÄKKINEN, H. M., KULONEN, E. AND WALLGREN, H.: The effect of ethanol and electrical stimulation on the amino acid metabolism of rat-brain-cortex slices *in vitro*. *Biochem. J.*, 88 (1963) 488-498.
- HARTEL, J. AND PLEUMEETERS, A. J. G.: A quantitative chromatographic determination of cysteic acid in amino acid mixtures on ion exchange papers. *Anal. Chem.*, 36 (1964) 1021-1022 — spectrophotometry after elution.
- JOSEPH, K. T. AND RAJENDRAN, K. R.: Quantitative estimation of proline (in protein hydrolysates) by paper chromatography. *Leather Sci.*, 10 (1963) 70-71; *C.A.*, 59 (1963) 9065g — elution of ninhydrin-coloured spot and photometry.
- KARPOV, V. L.: (The isolation of ^{14}C -labelled amino acids by ion exchange and paper chromatography). *Vestn. Leningr. Univ.*, 18, No. 9, Ser. Biol., No. 2 (1963) 108-114; *C.A.*, 59 (1963) 11867b.
- KHARAT'YAN, A. M.: (Paper-chromatographic study of some blood serum and urine amino acids in patients having Botkin's disease). *Sb. Nauchn. Tr. Tashkentsk. Gos. Med. Inst.*, 17 (1961) 22-26; *C.A.*, 59 (1963) 15748g.
- LOEFER, J. B. AND SCHERBAUM, O. H.: Free amino acids in Tetrahymenidae. *J. Protozool.*, 10 (1963) 275-279; *C.A.*, 59 (1963) 11916h.
- MORREALE DE ESCOBAR, G., LLORENTE, P., JOLIN, T. AND ESCOBAR DEL REY, F.: The "transient instability" of thyroxine and its biochemical applications. *Biochem. J.*, 88 (1963) 526-530.
- SCHARPENSEEL, H. W. AND KRAUSSE, R.: (Radiochromatographic studies on the turnover of sulphate, and of the S-amino acids cystine and methionine in soil and humic acid). *Z. Pflanzenernaehr. Dueng. Bodenk.*, 101 (1963) 11-23; *C.A.*, 59 (1963) 9267e.
- YANG, S. F. AND MILLER, G. W.: Biochemical studies on the effect of fluoride on higher plants. I. Metabolism of carbohydrates, organic acids and amino acids. *Biochem. J.*, 88 (1963) 505-509.

19. PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS AND PEPTIDES

- FUJIWARA, T. AND COULSON, C. B.: Further studies on milk-whey glycopeptides and the products of lysine-lactose browning systems. *Biochem. J.*, 88 (1963) 61P-62P.

20. PROTEINS

- DEYL, Z. AND ROSMUS, J.: Paper chromatography of the denaturation and first degradation products of collagen. *J. Chromatog.*, 14 (1964) 537-539 — mixtures of alcohol-acetic acid-water.

21. PURINES, PYRIMIDINES, NUCLEOSIDES, NUCLEOTIDES, NUCLEIC ACIDS, BARBITURATES

- BERGNER, H.: (Paper-chromatographic separation of 2',3'-ribomononucleotides, with special consideration of the possibilities for quantitative microanalytical errors). *Z. Med. Labortech.*, 3 (1962) 305-322; *C.A.*, 59 (1963) 9066f.
- BOBRANSKI, B. AND SYPER, L.: Metabolism of 5-allyl-5-(β -hydroxypropyl)-barbituric acid in the human body. *Arch. Immunol. Terapii Doswiadczennej*, 9 (1961) 579-591; *C.A.*, 59 (1963) 12041e.
- BROWN, E. G.: Purine and pyrimidine derivatives in mature pea seeds. *Biochem. J.*, 88 (1963) 498-504.
- HAINES, J. A., REESE, C. B. AND LORD TODD: The methylation of nucleosides and mononucleotides with diazomethane. *J. Chem. Soc.*, (1964) 1406-1412.
- JACOBSON, K. B.: Chromatographic separation of nucleotides and nucleosides. *J. Chromatog.*, 14 (1964) 542-543 — on DEAE-cellulose paper and plain paper.
- KURSKII, M. D.: (Study by paper chromatography of the content of adenosine triphosphate (ATP) and products of its metabolism in the brain of animals). *Ukr. Biokhim. Zh.*, 35 (1963) 535-541; *C.A.*, 59 (1963) 14375d.

22. ALKALOIDS

- GUTORSKA, A.: (Separation and identification of nicotinic and isonicotinic acids and amides by paper chromatography). *Chem. Anal. (Warsaw)*, 9 (1964) 597-600.
- HEARST, P. J.: Greenheart alkaloids. II. Isolation and characterization of seven alkaloids. *J. Org. Chem.*, 29 (1964) 466-470.
- IVANOV, N.: (Study of alkaloids in Bulgarian cigarettes and smoke by means of paper chromatography). *Compt. Rend. Acad. Bulgare Sci.*, 12 (1959) 317-320; *C.A.*, 59 (1963) 15616d.
- KAPADIA, G. J., BALDWIN, H. H. AND SHAH, N. J.: Paper chromatography and identification of *Magnolia acuminata* L. alkaloids. *J. Pharm. Pharmacol.*, 16 (1964) 283-284.

PIERZHALSKI, T. AND PIECHNIK, Z.: (Quantitative determination with cationite paper of several glycoalkaloids occurring simultaneously in potatoes). *Chem. Anal. (Warsaw)*, 9 (1964) 283-289.

PLATEK, J.: (Paper chromatographic method for rapid detection of the main alkaloids in tobacco). *Chem. Anal. (Warsaw)*, 9 (1964) 261-266.

SYHORA, K., ČEKAN, Z., HEŘMÁNEK, S. AND TROJÁNEK, J.: Steroid derivatives. XVIII. Isolation of alkaloids of the solasodine type from Solanaceae. *Planta Med.*, 10 (1962) 318-326; *C.A.*, 59 (1963) 15598e.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

JANNES, J., LEPPANEN, V. V. E. AND OKA, M.: Tryptophan metabolites in the urine and liver metastases in carcinoid syndrome. *Ann. Med. Exptl. Biol. Fenniae (Helsinki)*, 41 (1963) 115-122; *C.A.*, 59 (1963) 14405d.

KOSAKA, K., IWAHARA, M. AND KONDO, T.: Direct-reacting bilirubin. *Proc. 8th Intern. Congr. Hematol., Tokyo, 1960*, Vol. 2 (Publ. 1962), pp. 1247-1250; *C.A.*, 59 (1963) 15595f.

MAGGIORE, Q.: (Quantitative paper chromatography of conjugated bilirubin in various biological fluids). *Rass. Fisiopatol. Clin. Terap. (Pisa)*, 35 (1963) 74-79; *C.A.*, 59 (1963) 11866g.

SILVESTRINI, B., CATANESE, B., CORSI, G. AND RIDOLFI, P.: The urinary metabolites of 5-(2-diethylaminoethyl)-3-phenyl-1,2,4-oxadiazole. *J. Pharm. Pharmacol.*, 16 (1964) 38-42.

YASUDA, H.: Microdetermination of the acrid substance in *Eutrema wasabi* by paper chromatography. *Nippon Nogeikagaku Kaishi*, 34 (1960) 725-728; *C.A.*, 59 (1963) 9246c.

24. ORGANIC SULPHUR COMPOUNDS

AEBI, H., LAUBER, E., LEHNER, H. AND MICHAELIS, W.: Zur Kenntnis der Verteilung in den Organen und der Ausscheidung von 9-[(N-Methyl-¹⁴C-3-piperidyl)-methyl]-thioxanthenthydrochlorid (Methixen). *Arzneimittel-Forsch.*, 14 (1964) 92-95.

COYNE, C. M. AND MAW, C. A.: The paper chromatography of aliphatic sulphonates. *J. Chromatog.*, 14 (1964) 552-555 — 15 substances, 7 solvent systems and 5 detection methods are described.

FOLKARD, A. R. AND JOYCE, A. E.: Collection and identification of thiols and disulfides. *J. Sci. Food Agr.*, 14 (1963) 510-514; *C.A.*, 59 (1963) 14278e.

VIGNOLI, L., GOUEZO, F. AND MOREL, M. C.: (Revealing spots of N-substituted phenothiazines, and their urinary metabolites on paper chromatograms). *Bull. Soc. Pharm. Marseille*, 11, No. 44 (1962) 53-56; *C.A.*, 59 (1963) 9065e.

WAGNER, G. AND BÖHME, S.: Über die Darstellung optisch aktiver Hydroxyphenylalkyl-sulfoxide. *Arch. Pharm.*, 297 (1964) 257-267.

25. ORGANIC PHOSPHORUS COMPOUNDS

ISHIKAWA, T.: Paper chromatography of sucrose esters. *Kogyo Kagaku Zasshi*, 66 (1963) 715-717; *C.A.*, 59 (1963) 15583a.

JOHNSTON, J. M. AND BEARDEN, J. H.: Phosphatidic acids as intermediates in fatty acid absorption. *Proc. 6th Intern. Conf. Biochem. Lipids, Marseilles, 1960*, (Publ. 1961), pp. 172-178; *C.A.*, 59 (1963) 14388f.

ROSE, H. G.: Studies on the molecular structure of rat liver cardiolipin. *Biochim. Biophys. Acta*, 84 (1964) 109-127.

TURPINI, R., MOSSA, A. AND CIPOLLI, P. L.: (Glass-paper chromatography as a means of detecting cerebral and serum phospholipids). *Boll. Soc. Ital. Biol. Sper.*, 37 (1961) 1315-1317; *C.A.*, 59 (1963) 11864b.

26. METALLO-ORGANIC COMPOUNDS

HILL-COTTINGHAM, D. G. AND LLOYD-JONES, C. P.: Analysis of iron-chelates in plant extracts. II. Ferric ethylenediamine-bis(*o*-hydroxyphenylacetic acid). *J. Sci. Food Agr.*, 14 (1963) 171-175; *C.A.*, 59 (1963) 11865e.

27. VITAMINS

FÜRTIG, W. AND POHLOUDEK-FABINI, R.: Spezifischer Nachweis und quantitative Bestimmung der Dehydroascorbinsäure nach papierchromatographischer Verteilung. *Pharmazie*, 19 (1964) 209-215.

HERRMANN, J. AND ANDRAE, W.: (Oxidative decomposition products of L-ascorbic acid. I. Paper chromatographic detection). *Nahrung*, 7 (1963) 243-255; *C.A.*, 59 (1963) 14269d.

LOSITO, R. AND MILLAR, G. J.: Preparative separation of vitamins K₁ and K₃ from vitamins K₂₍₃₀₎ and K₂₍₃₅₎ by column chromatography. *J. Chromatog.*, 14 (1964) 496-499.

- MIKI, T., KIKUCHI, N. AND SAHASHI, Y.: Paper chromatographic estimation of L-ascorbic acid and D-araboascorbic acid. *J. Vitaminol. (Kyoto)*, 8 (1962) 279-285; *C.A.*, 59 (1963) 11865g.
 SVOBODOVÁ-LÉBLOVÁ, S., KOŠTIŘ, J. V. AND HAIS, I. M.: Paper partition chromatography of riboflavin decomposition products. The action of some reducing and oxidizing agents on riboflavin solutions. *J. Chromatog.*, 14 (1964) 451-455.
 VLITOS, A. J. AND CUTLER, H. G.: The natural auxins of the sugar cane. A paper-chromatographic separation of the growth factors present in true seed. *Proc. Brit. West Indies Sugar Technologists*, 1960, pp. 113-127; *C.A.*, 59 (1963) 11891a.

28. ANTIBIOTICS

- AMERICAN CYANAMID CO. (by COSULICH, D. B., PATRICK, J. B. AND WILLIAMS, R. P.): Antibiotics. *French Pat.* M 1661 (Febr. 18, 1963); *C.A.*, 59 (1963) 12132c.
 GUPTA, V. S. AND RAO, P. L. N.: Antibiotic principles of *Garcinia morella*. V. Reverse-phase paper chromatography of constituents of gamboge resin and seed coat, and isolation and characterization of γ - and δ -guttiferinic acids and guttiferins. *Indian J. Chem. Soc.*, 1 (1963) 259-266; *C.A.*, 59 (1963) 14293b.
 KHOKHLOV, A. S. AND RESHETOV, P. D.: Chromatography of streptothricins on carboxymethyl-cellulose. *J. Chromatog.*, 14 (1964) 495-496.

29. INSECTICIDES AND OTHER PESTICIDES

- DUTT, M. C. AND SEOW, P. H.: New spray reagents for the detection of thiophosphate insecticides on paper chromatograms. *J. Agr. Food Chem.*, 11 (1963) 467; *C.A.*, 59 (1963) 15580f — Metanil Yellow, Yellow RFS, and methyl orange.
 KORANSKY, W., PORTIG, J. AND MUENCH, G.: (Absorption, distribution and elimination of α - and γ -benzene hexachloride). *Arch. Exptl. Pathol. Pharmakol.*, 244 (1963) 564-575; *C.A.*, 59 (1963) 9227h.

30. SYNTHETIC AND NATURAL DYES

- BECK, F.: (Die Wertbestimmung saurer Diazofarben, ihren Gehalt an Feuchtigkeit und Natriumchlorid und insbesondere ihr papierchromatographisches Verhalten). *Stain Technol.*, 38 (1963) 165-171; from *Z. Anal. Chem.*, 203 (1964) 147.
 CALZOLARI, C., COASSINI, L. AND LOKAR, L.: (Partition paper chromatography of food dyes). *Rass. Chim.*, 15, No. 2 (1963) 49-60; *C.A.*, 59 (1963) 9238f.
 LATINÁK, J.: Chromatographie der optischen Aufhellmittel auf Basis der 4,4'-Diaminostilben-2,2'-disulfosäure. *J. Chromatog.*, 14 (1964) 482-484.
 POPOVA, I. A.: (The investigation of plastid pigments by means of paper chromatography). *Tr. Botan. Inst. Akad. Nauk SSSR, Ser. 4, Eksperim. Botan.*, No. 16 (1963) 154-164; *C.A.*, 59 (1963) 14295h — colorimetry after elution from paper.
 SAAKOV, V. S.: (Method of preparing pure xanthophylls). *Botan. Zh.*, 48 (1963) 554-557; *C.A.*, 59 (1963) 9015d.
 SADINI, V.: (Identification of extraneous food dyes in dairy products). *Proc. 16th Intern. Dairy Congr., Copenhagen, 1962, Sect. C.*, pp. 474-486; *C.A.*, 59 (1963) 15850h — R_F values of 20 coal tar dyes.
 WOLLENWEBER, P.: (Trennung von synthetischen Lebensmittelfarbstoffen). *Mitt. Bg. GdCh. Fachgr. Lebensmittelchem. Gerichtl. Chem.*, 17 (1963) 67-70; from *Z. Anal. Chem.*, 203 (1963) 63.

32. PHARMACEUTICAL APPLICATIONS

- LEYBOLD, K. AND STAUDINGER, H.: (Hydroxylation of phenylbutazone and imipramine by rabbit liver microsomes). *Z. Ges. Exptl. Med.*, 136 (1962) 78-85; *C.A.*, 59 (1963) 12043g — paper and thin-layer chromatography.
 LIN, S.-C. C. AND WAY, E. L.: Use of paper chromatographic techniques on urine for evaluating narcotic usage by the nalorphine pupil test. *J. Forensic Sci.*, 8 (1963) 209-219; *C.A.*, 59 (1963) 15584d.
 RENGEI, B.: (Paper chromatography in toxicological examination). *Morphol. Igazsagugyi Orrosi Szemle*, 1 (1961) 130-135; *C.A.*, 59 (1963) 15844a.
 ZARNACK, J. AND PFEIFER, S.: Dünnschichtchromatographie in Unterricht und Praxis der Arzneianalyse. I. Methodik: Analgetica, Antipyretica, Purine, Sulfonamide, Alkaloida und analoge Synthetica. *Pharmazie*, 19 (1964) 216-224.

33. INORGANIC SUBSTANCES

- DATTA, S. K. AND SAHA, S. N.: Paper chromatographic separation of thorium, zirconium and uranium. *Z. Anal. Chem.*, 202 (1963) 332-339.

- MÖLLER, H. G. AND ZELLER, N.: Glyoxal-bis-(2-hydroxyanil), ein Reagens für papierchromatographisch getrennte Kationen. *J. Chromatog.*, 14 (1964) 560-564 — examination of 34 ions.
- O'LAUGHLIN, J. W. AND BANKS, CH. V.: Separation of various cations by reversed-phase partition chromatography using neutral organophosphorus compounds. *Anal. Chem.*, 36 (1964) 1222-1229.
- PRÁŠILOVÁ, J. AND ŠEBESTA, F.: The chromatography of some cations on paper impregnated with ammonium phosphotungstate. *J. Chromatog.*, 14 (1964) 555-560 — ^{86}Rb , ^{134}Cs , ^{89}Sr and ^{91}Y .
- SZCZEPANIAK, W.: (Diphenylcarbazide resin. II. Quantitative determination of microgram quantities of chromium on paper impregnated with the ion exchanger Sel-K5). *Chem. Anal. (Warsaw)*, 9 (1964) 481-485.

34. RADIOACTIVE COMPOUNDS

- HIRSCH, P.: (CO_2 -fixation by hydrogen bacteria. II. Chromatographic evidence of early fixation products). *Arch. Mikrobiol.*, 46 (1963) 53-78; *C.A.*, 59 (1963) 14317b.

35. MISCELLANEOUS COMPOUNDS AND COMPLEX MIXTURES

- KHAFAGY, S. M.: (Characterization and assay of gazarin, bitter principle of fruits of *Daucus carota* var. *boissieri*). *Svensk Farm. Tidskr.*, 67 (1963) 349-354; *C.A.*, 59 (1963) 9016h — paper and thin-layer chromatography.

Thin-layer Chromatography

2. FUNDAMENTALS, THEORY AND GENERAL

- BRODASKY, T. F.: Reproducibility of R_F and correlation of chromatographic patterns on paper and thin layer plates. *Anal. Chem.*, 36 (1964) 996-999.

3. TECHNIQUES I

- ABBOTT, D. C. AND THOMSON, J.: Wedge-layer chromatography for pesticide residue clean-up. *Chem. Ind. (London)*, (1964) 481.
- BROWN, T. L. AND BENJAMIN, J.: Useful thin-layer chromatography techniques. *Anal. Chem.*, 36 (1964) 446-447 — prewashing of silica plates; photography of plates.
- HUETTENRAUCH, R., KLOTZ, L. AND MUELLER, W.: (Thin-layer chromatography on ion-exchange resins). *Z. Chem.*, 3 (1963) 193; *C.A.*, 59 (1963) 14278e — vitamin B complex on Wofatit CP 300.
- KAPADIA, G. J. AND RAO, G. S.: Circular thin-layer chromatography of tetracyclines. *J. Pharm. Sci.*, 53 (1964) 223-224.
- TAKITANI, S. AND MATSUDA, K.: Simple electro-motive applicator for thin-layer chromatography. *Japan Analyst*, 13 (1964) 562-563.
- WREN, J. J. AND SZCZEPANOWSKA, A. D.: Chromatography of lipids in presence of an antioxidant, 4-methyl-2,6-di-*tert*.-butylphenol. *J. Chromatog.*, 14 (1964) 405-410.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

- SAWICKI, E., STANLEY, T. R., PFAFF, J. D. AND ELBERT, W. C.: Thin-layer chromatographic separation of benzo(*a*)pyrene and benzo(*k*)fluoranthene from airborne particulates. *Chemist Analyst*, 53 (1964) 6-8.

6. ALCOHOLS

- WEKELL, J. C., HOULE, C. R. AND MALINS, D. C.: A method for the isolation of mono- and dihydric alcohols from complex mixtures. *J. Chromatog.*, 14 (1964) 529-531 — alcohols are fractionated in the form of nitrates.

7. PHENOLS

- SLONAKER, D. F. AND SIEVERS, D. C.: Identification of trace quantities of antioxidants in polyethylene. *Anal. Chem.*, 36 (1964) 1130-1132.
- WENKERT, E., LOESER, E.-M., MAHAPATRA, S. N., SCHENKER, F. AND WILSON, E. M.: Wheat bran phenols. *J. Org. Chem.*, 29 (1964) 435-439.

8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

- MENSSEN, H. G. AND HONERLAGEN, H.: Ein exakter Aescin-Nachweis mit Hilfe der Dünnschicht-chromatographie. *Mitt. Deut. Pharm. Ges.*, 34 (1964) 97-98.
 VULF'SON, N. S., ZARETSKII, V. I. AND CHETVERIKOVA, L. S.: (Thin-layer chromatography of naturally-occurring coumarins and furocoumarins). *Izv. Akad. Nauk SSSR, Ser. Khim.*, (1963) 1503-1505; *C.A.*, 59 (1963) 15584c.

9. OXO COMPOUNDS

- COBB, W. Y.: Separation of 2,4-dinitrophenylosazones of vicinal dicarbonyls into classes by thin-layer chromatography. *J. Chromatog.*, 14 (1964) 512-513 — Sea Sorb 43 with silica gel or celite and plaster of Paris.
 ZAMOJSKI, A. AND ZAMOJSKA, F.: (Identification of volatile aliphatic aldehydes and ketones in the form of 2,4-dinitrophenylhydrazones by thin-layer chromatography). *Chem. Anal. (Warsaw)*, 9 (1964) 589-596.

10. CARBOHYDRATES

- FUJIWARA, T. AND COULSON, C. B.: Glycopeptide components of bovine milk whey with possible anti-mycobacterial activity. *Biochem. J.*, 88 (1963) 61P — alumina plates.
 GRASSHOFF, H.: Dünnschicht-chromatographische Bestimmungen von Zuckern und Zuckeralkoholen auf Magnesiumsilikat. *J. Chromatog.*, 14 (1964) 513-515 — replacement of part of the water in the propanol-water system by a primary amine reduces the R_F values of ketoses and non-reducing compounds, but not of aldoses.
 SHASHA, B. AND WHISTLER, R. L.: Celite-starch for thin-layer chromatography. *J. Chromatog.*, 14 (1964) 532-533 — applied for amino acids, sugars, methyl glycosides, purines, pyrimidines, nucleosides and nucleotides.

11. ORGANIC ACIDS AND SIMPLE LIPIDS

- COPIUS-PEEREBOOM, J. W. AND BEEKES, H. W.: Thin-layer chromatography of preserving agents. *J. Chromatog.*, 14 (1964) 417-423 — on cellulose, silica gel and kieselgur, kieselgel paper.
 DE VRIES, B. AND JURRIENS, G.: Determination of triglyceride composition by horizontal thin-layer chromatography. *J. Chromatog.*, 14 (1964) 525-526.
 JONES, D. F., MACMILLAN, J. AND RADLEY, M.: (Identification of gibberellic acid in immature barley). *Brauwissenschaft*, 16 (1963) 316-317; *C.A.*, 59 (1963) 15603d.
 KAGAWA, T., FUKINBARA, T. AND SUMIKI, Y.: Thin-layer chromatography of gibberellins. *Agr. Biol. Chem. (Tokyo)*, 27 (1963) 598-599; *C.A.*, 59 (1963) 14503h.
 KOREY, S. R. AND GONATAS, J.: Separation of human brain gangliosides. *Life Sci.*, 2 (1963) 296-302; *C.A.*, 59 (1963) 15675f.
 LANEELLE, G.: (Mycolic acids of *Mycobacterium paratuberculosis*; fractionation by thin-layer chromatography). *Compt. Rend.*, 257 (1963) 781-783; *C.A.*, 59 (1963) 9100h.
 NELSON, J. H., GLASS, R. L. AND GEDDES, W. F.: Silicic acid chromatography of wheat lipids. *Cereal Chem.*, 40 (1963) 337-343; *C.A.*, 59 (1963) 12082d.
 RINK, M. AND HERRMANN, S.: Dünnschichtchromatographische Trennung von Ketocarbon-säuren. *J. Chromatog.*, 14 (1964) 523-524 — products of the reaction with 4-oxothiazolidine-2-thione are separated on acetyl-cellulose.
 WAGNER, H. AND FRIEDRICH, H.: Über das Vorkommen einer Octadecatetraensäure in der Samen einiger Boraginaceen. *Naturwissenschaften*, 51 (1964) 164.
 WAGNER, H. AND POHL, P.: Zur Kenntnis der Polyenfettsäuren von Meeresalgen. *Naturwissenschaften*, 51 (1964) 163-164.

13. STEROIDS

- AUDRIN, P., FOSSARD, F. C., BOURGOIN, CH., JUNG, L. AND MORAND, P.: (Application of thin-layer chromatography in identifying and estimating hormones. II. Separation and determination of urinary aldosterone). *Rev. Franc. Etudes Clin. Biol.*, 8 (1963) 507-512; *C.A.*, 59 (1963) 14256b.
 BANG, H. O.: A simplified method for the quantitative determination of pregnanediol in urine. *J. Chromatog.*, 14 (1964) 520-523.
 IKAN, R., HAREL, S., KASHMAN, J. AND BERGMANN, E. D.: The separation of sterols and corresponding stanols by thin-layer chromatography. *J. Chromatog.*, 14 (1964) 504-506.
 JACOBSON, G. M.: Quantitation of estrone, estradiol and estriol on thin-layer chromatograms by a photogrammetric procedure. *Anal. Chem.*, 36 (1964) 275-279.
 O'DORCHAI, R., FLANAGAN, P. J. AND THOMSON, J. B.: Steroids. I. 4α -Methylergostan. *J. Chem. Soc.*, (1964) 1142-1147 — detection with chlorosulphonic acid-acetic acid mixture.

- OERTEL, G. W., TORNERO, M. C. AND GROOT, K.: Thin-layer chromatography of steroid conjugates. *J. Chromatog.*, 14 (1964) 509-511 — ion-exchange celluloses.
- SAMUEL, P., URIVETZKY, M. AND KALEY, G.: Separation and radioassay of fecal cholesterol and coprosterol using thin-layer chromatography. *J. Chromatog.*, 14 (1964) 508-509.
- TAKEUCHI, M.: Analysis of steroids. I. Analysis of steroid hormones by thin-layer chromatography. *Chem. Pharm. Bull. (Tokyo)*, 11 (1963) 1183-1188; *C.A.*, 59 (1963) 15558h — relationship between the adsorptivity and functional groups.
- TISHLER, F. AND BRODY, S. M.: Methandrostenolone — mechanism of hydrochloric acid induced fluorescence. *J. Pharm. Sci.*, 53 (1964) 161-164 — preparative TLC.
- VECSEI (WEISZ), P., KEMÉNY, V. AND GÖRGÉNYI, A.: Separation of corticosteroids by thin-layer chromatography on silica gel plates containing tetrazolium blue. *J. Chromatog.*, 14 (1964) 506-507.

14. STEROID GLYCOSIDES

- MATSUMOTO, N.: Analysis of steroids. II. Analysis of steroid saponins by thin-layer chromatography. *Chem. Pharm. Bull. (Tokyo)*, 11 (1963) 1189-1192; *C.A.*, 59 (1963) 15559a — *R_F* values of 20 steroid saponins.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

- BENASSI, C. A., VERONESE, F. M. AND GINI, E.: Thin-layer chromatography of metabolic derivatives of tryptophan. *J. Chromatog.*, 14 (1964) 517-519 — polyamide layers.
- NEURATH, G. AND DOERK, E.: Identifizierung und quantitative Bestimmung einzelner primärer und sekundärer Amine aus Gemischen als 4'-Nitro-azobenzolcarbonsäure-(4)-amide. *Chem. Ber.*, 97 (1964) 172-178 — two-dimensional TLC on silica gel G.

18. AMINO ACIDS

- EULER, H. von, HASSELQUIST, H. AND LIMNELL, I.: (Thin-layer chromatographic experiments). *Arkiv Kemi*, 21 (1963) 259-264; *C.A.*, 59 (1963) 15706g.
- MASSAGLIA, A. AND ROSA, U.: Separation of ¹³¹I-labelled monoiodotyrosine and diiodotyrosine by thin-layer chromatography. *J. Chromatog.*, 14 (1964) 516-517.

21. PURINES, PYRIMIDINES, NUCLEOSIDES, NUCLEOTIDES, NUCLEIC ACIDS, BARBITURATES

- SAHLI, M. AND OESCH, M.: Beitrag zur Dünnschichtchromatographie von Barbituraten. *J. Chromatog.*, 14 (1964) 526-529 — 18 barbiturates and hydantoins on silica gel.

22. ALKALOIDS

- MCLAUGHLIN, J. L., GOYAN, J. E. AND PAUL, A. G.: Thin-layer chromatography of ergot alkaloids. *J. Pharm. Sci.*, 53 (1964) 306-310 — on silica gel G.
- OSWALD, N. AND FLÜCK, H.: Getrennte Bestimmung von Alkaloiden mittels Dünnschichtchromatographie. I. Mitt. Methode zur getrennten Bestimmung der Tropinalkaloide in Solanaceendrogen und der Cinchona-Alkalioide. *Pharm. Acta Helv.*, 39 (1964) 293-304.
- PENNA-HERREROS, A.: Chromatographic separation of morphine, normorphine and nalorphine. *J. Chromatog.*, 14 (1964) 536.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

- BENDER, D. F., SAWICKI, E. AND WILSON, R. M.: Fluorescent detection and spectrophotofluorometric characterization and estimation of carbazoles and polynuclear carbazoles separated by thin-layer chromatography. *Anal. Chem.*, 36 (1964) 1011-1017.
- PECHTOLD, F.: Untersuchung über den oxydativen Abbau von Derivaten des 4-Aminophenazons. *Arzneimittel-Forsch.*, 14 (1964) 258-259.

24. ORGANIC SULPHUR COMPOUNDS

- LEHNER, H., LAUENER, H. AND SCHMUTZ, J.: Zum Metabolismus von 9-[(N-Methyl-3-piperidyl)-methyl]-thioxanthen·HCl. *Arzneimittel-Forsch.*, 14 (1964) 89-91.

25. ORGANIC PHOSPHORUS COMPOUNDS

- ARAKI, E.: Thin-layer chromatography of total serum lipids. *Nishin Igaku*, 50 (1963) 85-91; *C.A.*, 59 (1963) 11866d.
- BURTON, R. M. AND GIBBONS, J. M.: Lipid composition of a rat-brain synaptic-vesicle fraction. *Biochim. Biophys. Acta*, 84 (1964) 220-223.

HORROCKS, L. A.: Thin-layer chromatography of brain phospholipids. *J. Am. Oil Chemists' Soc.*, 40 (1963) 235-236; *C.A.*, 59 (1963) 11864e.

27. VITAMINS

JOHNSON, D. B. AND GOODWIN, T. W.: α -Hydroxyethylthiamine in plant tissues. *Biochem. J.*, 88 (1963) 62P-63P.

29. INSECTICIDES AND OTHER PESTICIDES

GELDMACHER-MALLINCKRODT, M.: (Detection of Systox (Demeton) and Meta-Systox as complexes with heavy metals). *Deut. Z. Ges. Gerichtl. Med.*, 54 (1963) 90; *C.A.*, 59 (1963) 15873e.

30. SYNTHETIC AND NATURAL DYES

BATTERHAM, T. J. AND WEISS, U.: The structure of elsinochrome A. *Proc. Chem. Soc.*, (1963) 89-90; *C.A.*, 59 (1963) 11802e.

GASPARIĆ, J. AND CEE, A.: Chromatographische Trennung substantiver Farbstoffe. *J. Chromatog.*, 14 (1964) 484-486 — on silica gel G.

PEYRON, L.: (Fluorescent substances present in the oleiferous cells of citrus fruits). *Compt. Rend.*, 257 (1963) 235-238; *C.A.*, 59 (1963) 9082g.

WHELAN, F. J. AND PLAA, G. L.: The application of thin-layer chromatography to sulfobromophthalein metabolism studies. *Toxicol. Appl. Pharmacol.*, 5 (1963) 457-463; *C.A.*, 59 (1963) 15778e.

32. PHARMACEUTICAL APPLICATIONS

BRUD, W. AND DANIEWSKI, W.: (The thin-layer chromatography as an industrial analytical method. Determination of anaesthesia in ethyl *p*-glycosyl-aminobenzoate and of resorcinol and resorcinol diacetate in the products of resorcinol monoacetate synthesis). *Chem. Anal. (Warsaw)*, 9 (1964) 267-273.

33. INORGANIC SUBSTANCES

SIECHOWSKI, J.: (An attempt at quantitative determination of chromic acid by thin-layer chromatography). *Chem. Anal. (Warsaw)*, 9 (1964) 391-392.

TAKITANI, S., FUKUOKA, N., IWASAKI, Y. AND HASEGAWA, H.: Total analysis of metallic ions by thin-layer chromatography. 2. *Japan Analyst*, 13 (1964) 469-471 — combination of the NH₄HS method and TLC for systematic analysis of cations.

ZABIN, B. A. AND ROLLINS, C. B.: Inorganic ion exchangers for thin-layer chromatography. *J. Chromatog.*, 14 (1964) 534-535 — 8 cations on zirconium phosphate (H⁺-form) and hydrous zirconium oxide (NH₄⁺- and HCl-form).

J. Chromatog., 16 (1964) 419-436

Gas Chromatography

1. REVIEWS AND BOOKS

- ABEL, K. AND BOBLE, F. W.: Three absolute gas chromatography detection methods and their potential for clinical analysis. *Trans. N.Y. Acad. Sci.*, 26, Ser. II, No. 2 (1963) 159-181.
- DAL NOGARE, S.: Summary of the second International Houston Symposium on "Advances in Gas Chromatography", *J. Gas Chromatog.*, 2 (1964) 189-191 — a review of the symposium held in Houston, Tex., March 23-26, 1964.
- GAS CHROMATOGRAPHY DIRECTORY. *J. Gas Chromatog.*, 2 (1964) 202-206 — a compilation of companies active in the field of gas chromatography: GC apparatus, accessories, supplements, services and literature sources; practically no information from East European countries such as Czechoslovakia, USSR, East Germany, etc.
- INGHELBRECHT, M.: Analyse du gaz par la méthode chromatographique. *Rev. Gen. Gaz*, 85, No. 3-4 (1963) 59-60.
- LITTLEWOOD, A. B.: Informal symposium of the Gas Chromatography Discussion Group. Process monitoring and control. *J. Gas Chromatog.*, 2 (1964) 186-188 — a review of 3 papers (HAWKES, J. C., PINE, C. S. F. and NOEBELS, A. J.), read at the London Meeting, April 10th, 1964.
- ZHUKHOVITSKIY, A. A. AND ANVAER, B. I.: (Gas chromatography). *Zh. Vses. Khim. Obshchestva im. D. I. Mendeleeva*, 9 (1964) 186-195.

2. FUNDAMENTALS, THEORY AND GENERAL

2a. Gas-liquid systems

- GIDDINGS, J. C.: The theoretical plate as a measure of column efficiency. *J. Gas Chromatog.*, 2 (1964) 167-169 — in addition to plate height, it is necessary to know the relative velocity difference and other parameters; plate height should be considered as a significant but not complete expression of the column resolution power.
- GIDDINGS, J. C. AND SCHETTLER, P. D.: Measurement and interpretation of the C terms of gas chromatography. *Anal. Chem.*, 36 (1964) 1483-1489 — two methods for the experimental isolation of gas and liquid contributions, C_g and C_l , are developed and applied.
- KNOX, J. H. AND McLAREN, L.: A new method for measuring gaseous diffusion coefficients and obstructive factors. *Anal. Chem.*, 36 (1964) 1477-1482 — equation for determining D_g and γ by a technique in which the sharp band of chromatographed gas is forced to stay for a known time in order to spread by diffusion) in the column during GC analysis.
- SCOTT, R. P. W.: Pressure changes during passage of a solute through a theoretical plate. *Anal. Chem.*, 36 (1964) 1455-1461 — the solute causes a pressure change which sharpens the front and tailing; it is significant especially in preparative GC.

2b. Gas-solid systems

- HANSEN, R. S., MURPHY, J. A. AND McGEE, T. C.: Gas chromatographic measurement of gas-solid interaction potentials and solid surfaces areas. *Trans. Faraday Soc.*, 60 (1964) 597-603 — GSC retention volumes at high temperatures are closely related to the adsorption.
- KISELEV, A. V., NIKITIN, YU. S., PETROVA, R. S., SHCHERBAKOVA, K. D. AND YASHIN, YA. I.: Effect of pore size of silica gels on the separation of hydrocarbons. *Anal. Chem.*, 36 (1964) 1526-1533 — adsorption heat measurements are compared and GC applications are discussed.
- PAPA, L. J.: Analysis of mixtures by differential reaction rates and gas-solid adsorption in gas chromatography. *Dissertation Abstr.*, 24 (1964) 3078 — more active type of sites cover about 23% of total surface area.

2c. Thermodynamics and theoretical relationships

- KOVATS, E.: Gas chromatographic characterization of organic substances in the retention index system. *2nd Intern. Symp. Advances Gas Chromatography, Houston, Tex., March 23-26, 1964*.
- LITTLEWOOD, A. B.: The specific retention of monofunctional organic solutes in monofunctional hexadecyl derivatives. *Anal. Chem.*, 36 (1964) 1441-1451 — regularities in V_g are observed and applied for the calculation of retention behaviour, with errors less than 10%.

2d. General

- ACKMAN, R. G.: Fundamental groups in the response of flame ionization detectors to oxygenated aliphatic hydrocarbons. *J. Gas Chromatog.*, 2 (1964) 173-179 — molar response seems to be calculable from fundamental groups formed by initial thermal breakdown of the molecule in the flame.

- GUIOCHON, G.: Influence of the apparatus on the apparent efficiency of columns in gas chromatography. *J. Gas Chromatog.*, 2 (1964) 139-145 — a theoretical discussion of the contributions of the apparatus to the zone spreading.
- HOUGHTON, G.: The additivity of rate and diffusion phenomena in continuous chromatography. *J. Chromatog.*, 15 (1964) 5-8 — theory can also be applied to GC.
- MATUKUMA, A.: (Retention index of methyl-paraffins in gas chromatography and comparison with "boiling point index"). *J. Chem. Soc. Japan, Pure Chem. Sect.*, 84 (1963) 774-779 — I_R on squalane is larger than on Apiezon and PEG and differs for derivatives having the methyl group in positions 2 or 3.
- SIMSON, R. E. AND MICALLEF, J. A.: Hand-sorted punched-card system for gas-chromatographic data. *Chem. Ind. (London)*, (1964) 743-745.
- ZHUKHOVITSKII, A. A., TURKEL'TAUB, N. M., SHVARTSMAN, V. P. AND SHLYAKOV, A. F.: (Diffuse spreading of the fronts and the calculation of the composition mixtures in chromatography without carrier gas). *Dokl. Akad. Nauk SSSR*, 156 (1964) 654-657.

3. TECHNIQUES I

3a. Detectors

- DIJKSTRA, A., FABRIE, C. C. M., KATEMAN, G., LAMBOO, C. J. AND THISSEN, J. A. L.: A recording conductometer for the determination of small amounts of carbon dioxide and its use in combination with the combustion technique in gas chromatography. *J. Gas Chromatog.*, 2 (1964) 180-183 — measuring of conductivity of NaOH solution absorbing CO₂; four-electrode cell and new absorption vessel are described in detail.
- KARMEN, A.: Specific detection of halogens and phosphorus by flame ionization. *Anal. Chem.*, 36 (1964) 1416-1421 — combustion products of halogen- and phosphorus-containing compounds react with Na on a wire mesh that has been treated with NaOH and which is heated in a hydrogen flame, thus increasing the ionization stream; nanogram quantities can be detected.
- LOVELOCK, J. E., SHOEMAKE, G. R. AND ZLATKIS, A.: Improved ionization cross-section detectors. *Anal. Chem.*, 36 (1964) 1410-1415 — the small volume (8 μ l) gives very high sensitivity; these detectors are advocated for interplanetary explorations.

3b. Column performance and filling studies

- GUILLEMIN, C. L. AND AURICOURT, F.: Choice of carrier gas for the gas density balance. *J. Gas Chromatog.*, 2 (1964) 156-159 — SF₆ as carrier gas gives higher sensitivity (comparable with katharometer) and wt. % data for permanent and related gases.
- HAWKES, S. J. AND MOONEY, E. F.: Temperature limitations of stationary phases in gas chromatography. *Anal. Chem.*, 36 (1964) 1473-1477 — the volatilities and viscosities of 32 stationary phases are given.
- KISELEV, V. A. AND YASHIN, YA. I.: (Influence of the structure of silica gels on the separation of hydrocarbons by gas chromatography). *Neftekhimiya*, 4 (1964) 494-500 — the Van Deemter curve becomes flatter with increasing pore diameter and its minimum is displaced to higher gas velocities.
- LECHNER-DE CHÄTEL, A.: (Study of various gas-chromatographic carriers in the determination of octachlorocyclopentene). *Magy. Kem. Folyóirat*, 70 (1964) 113-115.
- PARCHER, J. F. AND URONE, P.: An improved solution coating technique for gas chromatographic supports. *J. Gas Chromatog.*, 2 (1964) 184-185 — an empirical technique for coating from 1-10 wt. % is described.
- ROGOZINSKI, M.: Subtraction gas chromatography of labile halogen compounds. *J. Gas Chromatog.*, 2 (1964) 163 — Versamide 900 irreversibly sorbs α -bromo-fatty acid esters.
- SCHNEIDER, W., BRUDERRECK, H. AND HALASZ, I.: Gas chromatographic separation of hydrocarbons (C₁ to C₈) by carbon number using packed capillary columns. *Anal. Chem.*, 36 (1964) 1533-1540 — CK3 graphitized carbon black (0.15-0.22 mm) coated with 0.4 wt. % of squalane and packed in 2 mm. I.D. glass capillary.
- STERNBERG, J. C. AND POULSON, R. E.: The particle-to-column diameter ratio effect on band spreading. *Anal. Chem.*, 36 (1964) 1492-1502 — a small turbulence effect contributes to the decrease of resolution at higher velocities.
- SZYMANSKI, H. A.: Molecular sieve as solid support. *J. Gas Chromatog.*, 2 (1964) 154-155 — separation is achieved on sieves coated with 10% of C₁₂H₂₆ or with compounds to be chromatographed.

3c. Apparatus, accessories and materials for GC

- BLOMSTRAND, R. AND GÜRTLER, J.: A method for the introduction of submicrogram samples into a gas chromatograph. *Acta Chem. Scand.*, 18 (1964) 276-278 — evaporation from a small Pt spiral heated to a sufficiently high temperature.

- GRANT, D. W.: Automatic capillary gas chromatography and sampling of distillation products. *Anal. Chem.*, 36 (1964) 1519-1522 — design of sampling valve operated up to 200°.
 JARRELL, J. E. AND ALLISON, A. W.: Automatic liquid sample injector for gas chromatography. *J. Gas Chromatog.*, 2 (1964) 192-193 — variation 2%.

4. TECHNIQUES II

4a. Preparative-scale GC

- GORDON, S. M. AND PRETORIUS, V.: Theory of preparative linear chromatography by elution development. The basic equations. *J. Gas Chromatog.*, 2 (1964) 196-201 — theoretical basis is given for the fact that, under all circumstances, there is an optimum value for the sample inlet volume.
 TARAMASSO, M. AND DINELLI, D.: Preparative scale gas chromatography by a laboratory rotating unit Part III. Isomers separation. *J. Gas Chromatog.*, 2 (1964) 150-153 — 100 columns, 1.2 m long, 6 mm I.D. are applied to the separation of some hydrocarbons as halogen derivatives.
 VLEUGELS, J. L. P. AND POSTHUMUS, J.: Fraction cutter for use in preparative gas chromatography. *J. Gas Chromatog.*, 2 (1964) 172.

4c High-speed GC

- VIDGERGAUZ, M. S. AND ANDREEV, L. V.: (Gas chromatography on small diameter columns). *Neftekhimia*, 4 (1964) 507-509 — application of capillary columns (I.D. less than 1 mm) to high-speed analysis.

4d. Special microtechniques

- ALISHOEV, V. R. AND BEREZKIN, V. G.: (Development of chromatographic columns using a moving sorbent). *Dokl. Akad. Nauk SSSR* 155 (1964) 876-879 — moving sorbent gives shorter times of analysis and sharper zones for high-boiling compounds too.
 BEROZA, M. AND ACREE, JR., F.: A new technique for determining chemical structure by gas chromatography. *J. Assoc. Offic. Agr. Chemists*, 47 (1964) 1-14 — Pd catalyst on diatomaceous earth as precolumn is applied with good results.
 CLARKE, S. A.: Pressure-programmed gas-liquid partition chromatography. *Nature*, 202 (1964) 1106 — the same practical results as by PTGC are obtained; no cooling-off period necessary; reproducible programming of pressure is easier; $\log P = kt + \log C$ and $k = (\log F - \log C)/T$ where C , F and P are the inlet column pressures at the start, finish and an intermediate time t , of a programme of duration T .
 JANÁK, J.: Multi-dimensional chromatography using different developing methods. *J. Chromatog.*, 15 (1964) 15-28 — theory and practice of a new type of two-dimensional chromatography in which one dimension is made by GC, the second one by thin-layer or paper chromatography; small quantities from the gas chromatogram are eluted on to the start-line of the continuously moving thin layer; application of the method is described.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5a. Gaseous hydrocarbons

- MIYAKE, H. AND MITOOKA, M.: (Gas chromatographic analysis of C₁-C₄ hydrocarbons using a mixed stationary liquid of high polarity). *J. Chem. Soc. Japan, Pure Chem. Sect.*, 84 (1963) 923-928 — dibutyl maleate + β,β'-oxydipropionitrile at 50°.
 PLŠKO, Š. AND FILÁK, J.: (Determination of low hydrocarbon content in partially stabilized petroleums). *Ropa Uhlie*, 6 (1964) 188-191.
 TSITSISHVILI, G. V., ANDRONIKASHVILI, G. A., TSHUMBURIDZE, T. A. AND KORIDZE, Z. I.: (Chromatographic separation of C₁-C₄ hydrocarbon gases on zeolites of X-type with different content of calcium). *Dokl. Akad. Nauk SSSR.*, 156 (1964) 932-936 — a study of adsorption and catalytic properties.

5b. Other hydrocarbons

- ALEKSANDROV, A. N., DEMENTIEVA, M. I., FEDCHENKO, G. S., SKOP, S. L. AND TYSOVSKII, G. I.: (Analysis of vinyltoluene by means of mass spectrometric and gas chromatographic methods). *Khim. i Tekhnol. Topliv i Masel*, No. 6 (1964) 64-67 — retention data of 16 aromatics on 3 stationary phases at 165°.
 ATTRILL, J. E.: Analysis of pyrolysis products of biphenyl. *AEC Report ORNL-3537*, Nov. 17 (1963) 117-118.
 HEINZE, H. O. AND ECKHARDT, F.: Beurteilung von Ölen mit Hilfe von ultrarotspektroskopischen und gaschromatographischen Untersuchungen. *Brennstoff-Chem.*, 45 (1964) 84-88 — on PEG in capillary columns at 170°.

HORTON, A. D. AND BOTTS, J. L.: Gas chromatography as applied to nuclear technology. II. Analysis of the hydrolysis products of uranium carbides and thorium carbides. *Nucl. Sci. Eng.*, 18 (1964) 97-105 — retention data of C₂-C₈ hydrocarbons liberated by hydrolysis and chromatographed on squalane, tricresyl phosphate, di-2-ethylhexyl sebacate and silica gel by PTGC 25-125°.

KREKEL, G. AND STEINBRECHER, F.: Untersuchung von Benzolvorerzeugnis nach konventionellen Verfahren und mittels Gaschromatographie. *Brennstoff-Chem.*, 45 (1964) 81-84 — aromatics on PEG at 150°.

5c. Halogen derivatives of hydrocarbons

DOUGHERTY, T. J.: Structure of vinyl fluoride-trifluoromethyl iodide telomers. *J. Am. Chem. Soc.*, 86 (1964) 460-463 — by PTGC on Carbowax 1500 at 90-220°, 4.6°/min.

MALINOWSKA, K.: (Analysis of halogen derivatives of C₁-C₈ hydrocarbons by gas chromatography). *Chem. Anal. (Warsaw)*, 9 (1964) 585-588 — on E-301 at 130°.

6. ALCOHOLS

BALAKHONTSEVA, V. N. AND POLTININA, R. M.: (Determination of glycols by a method of gas-liquid chromatography). *Zh. Anal. Khim.*, 29 (1964) 757-760 — on PEG-10M.

7. PHENOLS

SMITH, G. A. L. AND KING, D. A.: Separation and identification of the steam volatile phenols present in cigarette smoke condensate by capillary column gas liquid chromatography. *Chem. Ind. (London)*, (1964) 540-541 — retention data for 16 phenols as methyl ethers and acetates by capillary GC on 2,4-xylenyl phosphate at 140° and 100°.

SMITH, J. R., NORMAN, R. O. C. AND RADDI, G. K.: Quantitative determination of isomeric phenols. *J. Gas Chromatog.*, 2 (1964) 146-149 — optimal data for separation of phenols and derivatives (fluoro-, chloro-, methoxy-, nitro- and cyano-) are given; low coating of glass beads with DEGA is recommended.

TAKEUCHI, T. AND KATO, N.: (Determination of a small amount of each isomer in 1- or 2-naphthol by gas-liquid chromatography). *J. Chem. Soc. Japan, Ind. Chem. Sect.*, 67 (1964) 305-308 (English summary p. A 19).

9. OXO COMPOUNDS

BRILL, W. F. AND INDICTOR, N.: Reaction of *tert*-butyl hydroperoxide with olefins. *J. Org. Chem.*, 29 (1964) 710-713 — retention data of *cis*- and *trans*-epoxides of 4-methyl-2-pentenes on diisodecyl phthalate at 130°.

NIINIVAARA, R. P., POHJA, M. S. AND KOMULAINEN, S. E.: Some aspects about using bacterial pure cultures in the manufacture of fermented sausage. *Food Technol.*, 18, No. 2 (1964) 25-31 — GC study of carbonyl fractions on PEG at 175°.

SINGLIAR, M., BRIDA, J. AND SPIŠSKÝ, V.: (Some analytical problems of products of oxo-synthesis). *Chem. Zvesti*, 18 (1964) 527-532 — retention data of C₄-C₅ aldehydes (and some alcohols) on PEG-400 at 140°.

10. CARBOHYDRATES

SWEENEY, C. C. AND WALKER, B.: Studies on the analysis of carbohydrates in glycolipids and gangliosides by gas chromatography. *Anal. Chem.*, 36 (1964) 1461-1466 — after methanolysis, analysis on SE-30 on silanized diatomite.

11. ORGANIC ACIDS AND SIMPLE LIPIDS

BADAMI, R. C. AND GUNDSTONE, F. D.: Vegetable oils. XIII. The component acids of isano (boleko) oil. *J. Sci. Food Agr.*, 14 (1963) 863-866 — retention data of saturated, olefinic and acetylenic fatty acid esters on Apiezon L at 200°.

BINDER, R. G., APPLEWHITE, T. H., DIAMOND, M. J. AND GOLDBLATT, L. A.: Chromatographic analysis of seed oils. II. Fatty acid composition of *Dimorphotheca* oil. *J. Am. Oil Chemists' Soc.*, 41 (1964) 108-111 — C₁₄-C₂₂ fatty acids on DEGS and Apiezon L at 200° and 250°.

CASON, J., SANDE, G. L., MILLER, W. T. AND WEISS, A.: Multibranched higher saturated acids from tubercle bacillus. *Tetrahedron*, 20 (1964) 91-106 — retention data of specific fatty acids on silicone grease at 225-278°.

CROSSLEY, A. AND THOMAS, A.: Keeping properties of edible oils. III. Identification of trace material adsorbed from peanut oil by chromatography on alumina. *J. Am. Oil Chemists' Soc.*, 41 (1964) 95-100 — retention data of methyl esters of oxygenated fatty acids on polyvinyl acetate column.

- DANIELS, N. W. R., FRAPE, D. L., EGGITT, P. W. R. AND COPPOK, J. B. M.: Studies on the lipids of flour. II. Chemical and toxicological studies on the lipids of chlorine-treated cake flour. *J. Sci. Food Agr.*, 14 (1963) 883-893 — retention data on PEGo-phthalate and PEGA at 190°.
- GOUW, T. H. AND VLUGTER, J. C.: Physical properties of fatty acid methyl esters. I. Density and molar volume. *J. Am. Oil Chemists' Soc.*, 41 (1964) 142-146 — on PEGA and Apiezon L.
- KINGSBURY, K. J. AND MORGAN, D. M.: Analysis of the fatty acids of normal human depot fat by gas liquid chromatography. *Biochem. J.*, 90 (1964) 140-147 — C₈-C₂₃ and branched C₁₃-C₂₄ fatty acids on PEGS, polyvinyl acetate and Apiezon L at 185°, 175-180° and 195°.
- KUCK, J. C., PONS, JR., W. A. AND FRAMPTON, V. L.: Physical and chemical properties of alumina bleached cottonseed oil. *J. Am. Oil Chemists' Soc.*, 41 (1964) 101-104 — on DEGS at 190°.
- MABROUK, A. F., DUTTON, H. J. AND COWAN, J. C.: Homogeneous catalytic hydrogenation of sorbic acid with pentacyanocobaltate. II. *J. Am. Oil Chemists' Soc.*, 41 (1964) 153-158 — C₆-C₇ acids on DEGS at 120°.
- MERCIER, O., CARRAZONI, N. E. AND BRENNER, R. R.: Methyl oct-cis-2-enoate. Its synthesis, GLC behavior, and infrared spectra. *J. Am. Oil Chemists' Soc.*, 41 (1964) 89-92 — retention data of cis- and trans-isomers of -enoate in comparison with -anoate and -ynoate on Apiezon N and PEGA at 100°.
- O'BRIEN, J. S., FILLERUP, D. L. AND MEAD, J. F.: Brain lipids. I. Quantification and fatty acid composition of cerebroside sulfate in human cerebral gray and white matter. *J. Lipid Res.*, 5 (1964) 109-116 — retention data of fatty acids (mainly 24:0 and 24:1) on Apiezon L at 235° and DEG at 180°.
- O'BRIEN, J. S. AND ROUSER, G.: Analysis of hydroxy fatty acids by gas-liquid chromatography. *Anal. Biochem.*, 7 (1964) 288-296 — retention data of free and acetylated 2- to 16-hydroxy-fatty acids on EGS at 185° and on Apiezon L at 235°.
- ORSUKI, A. AND HANYA, T.: (Gas chromatographic determination of lower fatty acids in polluted water). *J. Chem. Soc. Japan, Pure Chem. Sect.*, 84 (1963) 798-802 — after isolation through steam distillation and absorption in NaOH solution on PEGS at 120°.
- PREISS, B. AND BLOCH, K.: ω -Oxidation of long chain fatty acids in rat liver. *J. Biol. Chem.*, 239 (1964) 85-88 — retention data of hydroxy- and keto-acids on XE-60 and DEGS at 212° and 198°.
- SCOTT, T. W., WARD, P. F. V. AND DAWSON, R. M. C.: Formation and metabolism of phenyl-substituted fatty acids in ruminant. *Biochem. J.*, 90 (1964) 12-25 — retention data of phenyl-fatty acid methyl esters on Apiezon L and PEGA.
- SUBBARAM, M. R.: Separation of saturated and unsaturated fatty acid esters of cholesterol by gas-liquid chromatography. *J. Chromatog.*, 15 (1964) 79-80.
- SUBBARAM, M. R. AND YOUNGS, C. G.: Isomerization of mono ethenoid acids during hydrogenation. *J. Am. Oil Chemists' Soc.*, 41 (1964) 150-152 — by PTGC on Apiezon L at 100-250°, 5.6°/min.

13. STEROIDS

- BROOKS, S. C. AND GODEFROI, V. C.: Quantitative collection of microamounts of steroids from gas-liquid chromatography. *Anal. Biochem.*, 7 (1964) 135-146 — a detailed study for the 1-200 µg range; quantitative collection in U-tube immersed in liquid nitrogen.
- CHAMBERLAIN, J. AND THOMAS, G. H.: Characterization of 20-oxosteroids by gas chromatography. *Anal. Biochem.*, 8 (1964) 104-115 — retention data of 9 steroids on QF-1-0065 at 250° and TLC separation of some overlapping peaks.
- CREECH, B. G.: Separation and determination of ketosteroids, pregnandiol and pregnantriol on one column. *J. Gas Chromatog.*, 2 (1964) 194-195 — as trimethylsilyl ethers at 210-215°.
- HAMILTON, R. J., VANDENHEUVEL, W. J. A. AND HORNING, E. C.: An extension of the "steroid number" concept to relationships between the structure of steroids. *Biochim. Biophys. Acta*, 70 (1963) 679-687 — many retention data on SE-30, NGS and QF-1 at 222° and 232°.
- KNIGHTS, B. A.: Gas chromatographic analysis of plant sterols. Part I. Characterisation of sterol double bonds using the ΔR_M function. *J. Gas Chromatog.*, 2 (1964) 160-162 — GC analysis of alcohols (as trimethylsilyl ethers or trifluoroacetates) resulting from hydroboronation of sterols; relative retention and ΔR_{M_r} data on 4 stationary phases for 9 and 10 sterols.
- KROMAN, H. S., KING, M. O. AND BENDER, S. R.: A method for the gas chromatographic separation of estrogens employing a solid injection system. *J. Chromatog.*, 15 (1964) 92-94 — on QF-1 at 252°.
- NAIR, P. P., SARLOS, I. S., SOLOMON, D. AND TURNER, D. A.: Simultaneous separation of 17-ketosteroids and estrogens by biphasic gas chromatography. *Anal. Biochem.*, 7 (1964) 96-102 — retention data of 10 steroids as trimethylsilyl ethers or trifluoroacetates on SE-30 and NGS at 197-205°.

LUUKKAINEN, T. AND ADLERCREUTZ, H.: Gas chromatography of methylated estrogens and application of the method to the analysis of human late pregnancy bile. *Biochim. Biophys. Acta*, 70 (1964) 700-703 — retention data of methyl ethers of steroids on XE-60, QF-1 and SE-30 at 212°, 180° and 190°.

TOUCHSTONE, J. C.: Routine quantitative gas chromatography of urinary estriol. *J. Gas Chromatog.*, 2 (1964) 170-171 — on QF-1-0065 at 255° with an argon detector.

WOTIZ, H. H. AND CHATTORAJ, S. C.: Methods of estrogen determination in low and high titre urines using thin-layer and gas chromatography. *Anal. Chem.*, 36 (1964) 1466-1472 — TLC separation in 4 groups and GLC quantification.

15. TERPENE DERIVATIVES

BARON, C. AND MAUME, B.: Les menthoglycoles. *Parfum., Cosmet., Savons*, 6 (1963) 361-368 — stereoisomers on Reoplex 400 at 175°.

COREY, E. J., MITRA, R. B. AND UDA, H.: Total synthesis of *d,l*-caryophyllene and *d,l*-isocaryophyllene. *J. Am. Chem. Soc.*, 86 (1964) 485-492 — on nitrile-silicone and fluoro-silicone grease at 125-180°.

HELLEVR, R. O., KEYZER, H. AND MCKERN, H. H. G.: The volatile oils of the genus *Eucalyptus* (family Myrtaceae). III. The leaf oil of *E. crenulata* Blakely and de Benzeville. *Australian J. Chem.*, 17 (1964) 283-285 — methoxypolyethylene glycol 750 plus picric acid as stationary phase.

IKEDA, R. M. AND SPITLER, E. M.: Composition of citrus oils. Isolation, identification and gas chromatographic estimation of some esters and alcohols of lemon oil. *J. Agr. Food Chem.*, 12 (1964) 114-117 — retention data of 11 terpenes on polydiethanolamine succinate at 139°.

KESTERSON, J. W. AND HENDRICKSON, R.: A comparison of red and white grapefruit oils. *Am. Perfumer Cosmet.*, 79 (1964) 34-36 — retention data on Carbowax 20M and DEGS at 150°.

LUKEŠ, V. AND KOMERS, R.: On terpenes. CLXIII. Gas chromatography of sesquiterpenic hydrocarbons. *Collection Czech. Chem. Commun.*, 29 (1964) 1598-1603 — retention data of 21 C₁₅ terpenes (from acyclic to tricyclic) on Apiezon L at 204°, PEGA at 180°, PEG-4000 at 174° and tetrakis-O-(2-cyanoethyl)-pentaerythritol.

SYDOW, E. VON.: Mass spectrometry of terpenes. II. Monoterpene alcohols. *Acta Chem. Scand.*, 17 (1963) 2504-2512 — purity determination on sucrose acetate isobutyrate and N,N,N'N'-tetrakis-(2-hydroxypropyl)-ethylenediamine at 100° and 110°.

16. NITRO AND NITROSO COMPOUNDS

HOFFMANN, A. K., FELDMAN, A. M., GELBLUM, E. AND HODGSON, W. G.: Mechanism of the formation of di-*tert*.-butylnitroxide from *tert*.-nitrobutane and sodium metal. *J. Am. Chem. Soc.*, 86 (1964) 639-646 — retention data for nitro- and nitroso-butanes, butyl nitrate and nitroxide and other compounds on diisodecyl phthalate and silicone grease at 110° and 118°.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

ANDERSONS, A. AND SHYMANSKAYA, M.: (Analysis of ethanolamine and piperazine mixtures by gas-liquid chromatography). *Izv. Akad. Nauk Latv. SSR, Ser. Khim.*, (1963) 525-529.

SANDBERG, D. H., BOCK, S. A. AND TURNER, D. A.: Quantitative measurement of Thalidomide by gas-liquid chromatography. *Anal. Biochem.*, 7 (1964) 129-132 — on XE-60 at 230°, QF-1 and DEGS at 185°.

18. AMINO ACIDS

VITT, S. V., SAPOROVSKAYA, M. B. AND BELIKOV, V. M.: (Analysis of amino acids by capillary chromatography). *Izv. Akad. Nauk SSSR, Otd. Khim. Nauk*, (1964) 947-958 — N-trifluoroacetyl methyl esters on Apiezon L; complete separation of diastereo isomers of isoleucine and threonine as N-trifluoroacetyl *n*-butyl esters at 140°.

22. ALKALOIDS

BROCHMANN-HANSEN, E. AND SVENSEN, A. B.: Quantitative determination of morphine in opium by gas-liquid chromatography. *J. Pharm. Sci.*, 52 (1963) 1134-1136 — retention data of morphine, laudanosine and tetraphenylethylene on PEG-9000 + SE-30 (0.1% + 4.0%) at 183°.

24. ORGANIC SULPHUR COMPOUNDS

MILLIGAN, B., RIVETT, D. E. AND SAVAGE, W. E.: Photolysis of dialkyl sulfides, disulfides and trisulfides. *Australian J. Chem.*, 16 (1963) 1020-1029 — retention data of sulphides (S₁-S₄) on silicone rubber or DC-550 at 125° and 200°.

OAKS, D. M., HARTMANN, H. AND DIMINCK, K. P.: Analysis of sulphur compounds with electron capture/hydrogen flame dual channel gas chromatography. *Anal. Chem.*, 36 (1964) 1560-1565 — a single column stream (Carbowax 20M, 143°) is split and led to two detectors and registered on a two-pen recorder.

26. METALLO-ORGANIC COMPOUNDS

BANK, H. M., SAAM, J. C. AND SPEIER, J. L.: The addition of silicon hydrides to olefinic double bonds. IX. Addition of *sym.*-tetramethyldisiloxane to hexene-1, -2, and -3. *J. Org. Chem.*, 29 (1964) 792-794 — retention data of 3 hexyltrimethylsilanes on liquid paraffin at 41°.

29. INSECTICIDES AND OTHER PESTICIDES

BACHE, C. A., GUTENMANN, W. H. AND LISK, D. L.: Detection of Amiben in tomatoes by electron affinity gas chromatography. *J. Agr. Food Chem.*, 12 (1964) 185-187 — retention data of 3-amino-2,5-dichlorobenzoic acid on DC silicone grease at 200°; estimation in the 0.02-1 p.p.m. range.

BECKMAN, H. AND BEVENUE, A.: Microcoulometric gas chromatographic analysis of grapes and cottonseed for chlorobenzilate residues. *J. Agr. Food Chem.*, 12 (1964) 184-185 — on DC-11 at 260° and on SE-30 by PTGS at 100-210°, 15°/min.

LICHENSTEIN, E. P., MORGAN, D. G. AND MUELLER, C. H.: Naturally occurring insecticides in cruciferous crops. *J. Agr. Food Chem.*, 12 (1964) 158-161 — retention data of 2-phenylethyl isothiocyanate on SE-30/NGA at 152°.

PENNELL, J. T., MISKUS, R. AND CRAIG, R.: The use of gas chromatography for the quantitative determination of microamounts of insecticide picked up by mosquitoes. *Bull. World Health Organ.*, 30 (1964) 91-95 — dieldrin on SE-30 at 180°.

VAN MIDDELEM, C. H. AND WAITES, R. E.: Gas chromatographic and colorimetric measurement of dimethoate residue. *J. Agr. Food Chem.*, 12 (1964) 178-182 — on SE-30 at 175°.

31. PLASTICS AND THEIR INTERMEDIATES

DRIENOVSKÝ, P. AND KYSEL', O.: (Pyrolysis of atactical polypropylene). *Chem. Zvesti*, 18 (1964) 512-526 — up to 700° the main product is propylene, at higher temperatures methane and ethylene; hydrogen as carrier gas.

DUNDON, J. P.: A study of cross-linking using vapor-phase chromatography. *Textile Res. J.*, 34 (1964) 340-346.

33. INORGANIC SUBSTANCES

33a. Permanent and rare gases

ABRAMOV, V. N., FISAK, V. I.: (Analysis of combustion products of methane-air mixtures by gas chromatography). *Zavodsk. Lab.*, 30 (1964) 675 — CH₄, CO and CO₂ in 3 min up to 10⁻³%.

AÏNSHTEIN, S. A., ANVAER, B. I. AND TURKEL'TAUB, N. M.: (Use of gas-liquid chromatography for separation of some inorganic gases). *Zavodsk. Lab.*, 30 (1964) 665-671 — separation of O₂ and N₂ on isobutyl alcohol and isoocetane at —78° (no mention is made of the very similar observations of DESTY in 1959); retention data for N₂, CO, O₂, CH₄ at —78° and CH₄, CO₂, HCl, H₂S and Cl₂ on hexadecane and butyrolactone at 20°.

ATTRILL, J. E.: Process chromatography for engineering tests. *AEC Report ORNL-3537*, Nov. 17 (1963) 47 — mixture of H₂, CO, CO₂ and O₂ + N₂ + CH₄.

KRICHEVSKY, M. I., ROGOSA, M. AND BISHOP, F. S.: Gas chromatographic analysis of hydrogen-carbon dioxide mixtures. *Anal. Biochem.*, 7 (1964) 350-356 — on molecular sieve 5A by PTGC.

MOSKVINA, A. A., KUZNECOVA, L. V., DOBYCHIN, S. L. AND ROZOVA, M. I.: (Microelemental analysis by means of gas chromatography. Determination of carbon, hydrogen and nitrogen in organic compounds). *Zh. Anal. Khim.*, 29 (1964) 749-753 — after combustion with CuO and reduction of NO_x with Cu on triethanolamine at 98° (N₂, CO₂ and H₂O).

PANSON, A. G. AND ADAMS, L. M.: Complete gas chromatographic analysis of hydrogen in fixed gases and hydrocarbons using one detector and helium as gas carrier. *J. Gas Chromatog.*, 2 (1964) 164-166. — optimum conditions with cross-section detector: 0.25 ml sample size, detector voltage 8 V, molecular sieve 13X at 40° and He 85 ml/min.

PETKOVIĆ, L. V., KOSANIĆ, M. M. AND DRAGANIĆ, I. G.: (Determination of CO₂, H₂ and O₂ in aqueous solutions by gas chromatography). *Bull. Inst. Nucl. Sci. "Boris Kidrich"* (Belgrade), 15 (1964) 9-15.

33b. Volatile inorganic compounds

DEVYATYKH, G. G., ZORIN, R. D., AMEL'GENKO, A. M., LYAMANOV, S. B. AND EZHELEVA, A. E.: (Chromatographic analysis of mixtures of some volatile inorganic hydrides). *Dokl. Akad. Nauk SSSR*, 156 (1964) 1105-1108 — hydrides of elements of Groups IV-VI on DC-702 and two Soviet silicone greases VKZH-94 B and PFMS-4; detection through hydrogen liberated in quartz reactor before katharometer.

34. RADIOACTIVE COMPOUNDS

TADMOR, J.: Application of isotopic exchange in gas chromatography. *Anal. Chem.*, 36 (1964) 1565-1573 — exchange of ^{36}Cl between chlorine of metal chloride and that sorbed on the uncoated solid phase.

35. MISCELLANEOUS COMPOUNDS AND COMPLEX MIXTURES

ATTAWAY, J. A., WOLFORD, R. W. AND ALBERDING, G. E.: Identification of alcohols and volatile organic acids from natural orange essence. *J. Agr. Food Chem.*, 12 (1964) 118-121 — C₁-C₉ alcohols, terpene alcohols and C₂-C₈ acids on Carbowax 20M.

BAKER, R. A.: Chromatographic evaluation of activated carbon. *J. Am. Water Works Assoc.*, 56 (1964) 92-98 — retention data of n-butanol, n-amyl acetate and water on UCON LB-550 X at 100°.

BECHER, P. AND BIRKMEIER, R. L.: The determination of hydrophile-lipophile balance by gas-liquid chromatography. *J. Am. Oil Chemists' Soc.*, 41 (1964) 169-172 — by means of the retention ratio of polar and non-polar compounds the polarity of surface-active agents (used as stationary phase) is measured.

BINGHAM, R. J.: Gas chromatographic studies on the volatiles of sterilized concentrated milk. *Dissertation Abstr.*, 24 (1964) 3523.

CONNELL, D. W.: Volatile flavoring constituents of the pineapple. *Australian J. Chem.*, 17 (1964) 130-140 — retention data of C₁-C₅ alcohols, C₂-C₈ fatty acid esters and thioesters on di-2-ethylhexyl sebacate, PEG and diisodecyl phthalate at 170°.

ENGELHARDT, J. AND FEJES, P.: (Gas chromatographic analysis of mixtures containing cyclohexanol, cyclohexanone and phenol). *Magy. Kem. Folyoirat*, 70 (1964) 171-174 — retention data on PEG-4000 at 150° and 180° with acetylacetone as internal standard.

KWEI, T. K. AND ARNHEIM, W. N.: Solubility of nonpolar gases in polymers: some new considerations. *J. Polymer Sci., Part A, Gen. Papers*, 2 (1964) 1873-1878 — applicable for sorption of small molecules in many stationary phases.

LIN TE-TSEN: (Application of gas chromatography in elemental analysis of organic compounds). *Chemistry (Huaxue Tongban)*, No. 2 (1964) 1-7.

NESTLER, H. AND SYCH, G.: Untersuchungen zur Reinheitsbestimmung von Monoäthylenglykol beim Gräutenerstellungsprozess. *Chem. Tech. (Berlin)*, 16 (1964) 283-287 — retention data of different compounds on 10 stationary phases at 165-207°.

J. Chromatog., 16 (1964) 419-436