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Er wordt een verslag gegeven van bovengenoemde conferentie.

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Samensteller: dr W.G. de Ruig

*CR*



Euroanalysis - IV, the "Fourth European Conference on Analytical Chemistry" was georganiseerd door de Finse Chemische Vereniging en werd gehouden van 23-28 augustus 1981 te Helsinki. Het aantal deelnemers bedroeg 750, afkomstig uit 39 landen. Er waren ruim 250 voordrachten en posters, grotendeels in parallelzittingen.

Daarnaast was er een tentoonstelling. De bijdragen waren als volgt gegroepeerd:

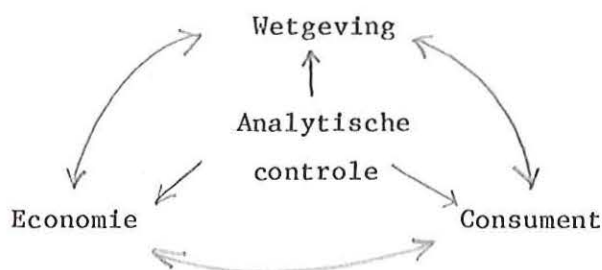
- Analytical Chemistry, the analyst and society (special session)
- Symbolism in analytical chemistry (special session)
- Mass spectrometry in inorganic analysis (special session)
- Photometric and catalytic methods
- Chromatography
- Nuclear analytical techniques
- Atomic absorption and emission spectroscopy
- Data evaluation and automation
- Water analysis
- Flow injection analysis - Clinical analysis
- Organic mass spectrometry (including GC/MS)
- Miscellaneous instrumental techniques
- Emission spectroscopy
- Trace element analysis
- Electroanalytical techniques
- Thermal analysis. Material science. Surface analysis. ESCA.X-ray methods
- Nuclear techniques
- Food analysis
- Electroanalytical chemistry
- Environmental analysis
- Atmospheric pollutants
- Kinetic and catalytic methods
- Extraction and complex equilibria
- Spectrophotometry
- Titrimetry
- Clinical chemistry. Pharmaceutical chemistry
- IR and Raman spectroscopy
- Solution equilibria and complex formation
- Polymer analysis

Voorts waren er nog een aantal plenaire voordrachten van meer algemene aard.

De indruk van het geheel was: meer consoliderend dan innoverend. Er was minder over nieuwe dure instrumentele technieken en meer over praktische toepassingen van reeds lang bestaande technieken. Ook bezinning over economisch werken.

Er was een speciale middag gewijd aan Analytische chemie en maatschappij, waarbij milieuproblematiek en voedingsmiddelenonderzoek aan de orde kwamen.

Pfannhauser stelde hierbij dat de analytische chemie in een dilemma geraakt is tussen wetgeving, economie en consument. Elk van deze vraagt analytische controle:



Hij en Ottendorfer wezen op de veel grotere complexiteit zowel van de vragen als van de analytische technieken t.a.v. vroeger: bioaccumulerende verbindingen vs. vochtgehalte; electrochemie, GC-MS in < ppb vs. pH meter.

Fresenius hanteerde het volgende schema van aandachtsgebieden voor onderzoek van ongewenste stoffen:

- Monsterneming
- Meting            b.v. fluorimetrie
- Bevestiging   NMR   IR   MS  
                vergelijken b.v.: HPLC: meer reproduceerbaar  
                               DLC : apparatuur goedkoper  
                               meer monsters  
                               storingen makkelijker op te sporen
- Wetgeving

In de discussie van deze speciale sessie kwam o.a. het probleem aan de orde dat er niet genoeg vertrouwen is in de analytische methode. Volgens Egan is dit inderdaad een groot probleem.

Fresenius pleitte voor meerdere onafhankelijke methoden, maar ook bij een officiële methode zullen de resultaten niet kloppen als intussen het monster verandert. Steeds is het de verantwoordelijkheid van de analyticus om te bepalen of het resultaat juist is of niet. Verder werd er gevraagd ook mislukkingen te publiceren. Malissa merkte op dat wij duidelijke definities nodig hebben (en daar schort het, blijkens het voorafgaande IUPAC symposium over harmonisatie van ringonderzoeken, nog wel aan), en dat het eis is bij te blijven, waarbij hij speciaal noemde bijscholingscursussen van post-gegradereerden.

In een algemene lezing stelde The Government Chemist, Egan, dat een methode die ondersteund wordt door ringonderzoek, sterk staat. Hij onderscheidde verschillende "soorten": analytisch chemici:

|                              |                                                              |
|------------------------------|--------------------------------------------------------------|
| - Chemisch analyticus        | Nat chemicus. Identificatie onbek.verb.                      |
| - Gespecialiseerd analyticus | Chemische structuur. Instrumenteel<br>Monsterneming. MS. NMR |
| - Instrumentele technoloog   | Instrumenten. Computer. Interfacing                          |
| - Produktie analyticus       | Industrie                                                    |
| - Instructeurs               | Nieuwe methoden. Training. Tentoonstellingen                 |

In een lezing over referentiematerialen definieerde Alvarez "definitieve methoden", dat zijn methoden zonder systematische fout en waarvan de onnauwkeurigheid bekend is.

Ramendik beschreef spark source massaspectrometrie (SSMS) als een van de meest universele en informatieve methoden voor elementanalyse. 70 elementen in  $10^{-2}$  -  $10^{-3}$  ppm gebied. Nog weinig toegepast omdat de instrumenten duur en ingewikkeld zijn en ook de complexe analytische procedure nog meer tot de kunst dan tot de wetenschap behoort. De commerciële apparaturen werken nog teveel onder ongecontroleerde omstandigheden. De eerste resultaten met een nieuwe eigenbouw generator zijn hoopgevend. Met een nieuwe generatie kleine MS en kan SS-MS voor inorganische multielement analyse een referentiemethode worden om andere methoden te testen.

Een concurrent is de plasmafakkel massaspectrometrie (PSMS), naar voren gebracht door Gray.

Er was een hele ochtendsessie gewijd aan (Fourier) infrarood en Raman-spectroscopie.

Hadzi: De signaal-ruisverhouding is voor een interferometer (FT-IR) 100 of meer keer zo groot als voor een monochromatorapparaat. Nodige hoeveelheden:

|                                 | <u>monochromator</u> | <u>interferometer</u> |
|---------------------------------|----------------------|-----------------------|
| normaal                         | 500 - 1000 µg        | 10 µg                 |
| met beam condensor              | 1 µg                 | 50 ng                 |
| met computer                    | 10 ng                | sub ng                |
| gas-cel, 10 cm, hoog opl. verm: |                      | 0,6 - 0,008 ppm       |
| gas-cel, 10 m                   |                      | 1 - 10 ppb            |

Met GC-FTIR kan een ruisvrij spectrum verkregen worden van 100 ng geïnjecteerd monster, in 0,26 s, en een herkenbaar spectrum van 5 ng. Voor analyse van functionele groepen kan een synthetisch interferogram (gesynthetiseerd uit spectra van verbindingen met functionele groepen) van groot nut zijn (Wiehold, Appl. Spectr. 34 (1980) 7).

Hippe beschreef een spectrumbibliotheek met 1500 zorgvuldig geselecteerde IR spectra, Weitkamp (van Bayer) identiteitscontrole van farmaceutica m.b.v. FT-IR, Kellner de toepassing van FT-IR op metaalorganische verbindingen en Malissa jr. de voordelen van een fotoionisatiedetector bij on-line GC-FTIR.

Nieuwe analytische mogelijkheden van Raman spectroscopie werden besproken door Huong. Door toepassing van resonantie-Raman spectroscopie wordt de benodigde hoeveelheid stof gereduceerd met een factor  $10^6$ . Hierdoor is deze techniek nu bruikbaar voor microchemische identificatie. Toepassingen o.a. vitamines in voedingsmiddelen, algemener: van alles in voedingsmiddelen, niet destructief; waterverontreiniging door pesticiden en fungiciden; oxy- en desoxyhemoglobine.

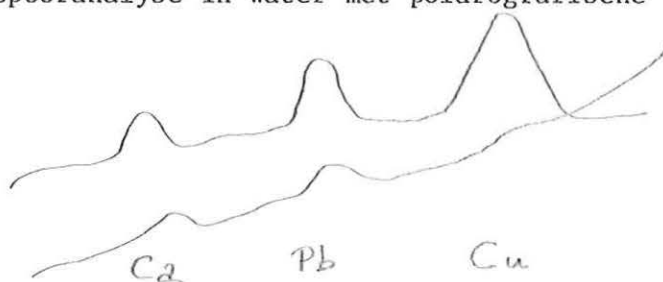
Ripson heeft een plasmatoorts ontwikkeld die gekoeld wordt met perslucht en die daardoor slechts 0,85 l/min argon gebruikt, tegen 5-15 l/min bij andere toortsen.

Bij electrothermische AAS kan volgens Herber een snellere opwarming verkregen worden door gebruik te maken van een pyrolytische temperatuurdetector die de temperatuur blijft meten (in tegenstelling tot o.a. Perkin Elmer) en deze terugkoppelt.

Scheubeck maakte reclame voor de Siemens Bioklav, waarmee zonder monstervoorbehandeling, zonder zuurkast, monsters gedestruueerd kunnen worden voor elementanalyse b.v. Hg, As, Cd, Pb, S, P, Cl in  $\mu\text{g/g}$  gebied. Voor de spoorelementanalyse in voedingsmiddelen schonk Schindler speciale aandacht aan de chemische verbindingen van die spoorelementen.

Frimmel heeft bij de metaalspooranalyse in water met polarografische methoden grote

verschillen waargenomen tussen directe meting en meting na destructie: Hij concludeerde



daarom dat er iets aan de hand is met organische stoffen in relatie met zware metalen.

Diëlectrische spectroscopie werd besproken door Helsen en door Nagy, o.a. voor vochtbepalingen.

De Iatroscan analyser, een commercieel verkrijgbaar instrument voor kwantitatieve DLC met een vlamionisatiedetector (TLC-FID) is door Kaitaranta toegepast voor lipidenonderzoek. Hiermee werd o.a. de oxidatie van visolies nagegaan.

Slanina hield een voordracht over ionenchromatografie voor de bepaling van anionen. Het apparaat is nogal ingewikkeld: 3 detectors, 3 kolommen, telkens te regenereren, computer om alles te regelen.

Differential pulse polarografie werd door Palmisano toegepast voor de bepaling van toxinen in koren. Meestal wordt hiervoor TLC of GC gebruikt, maar deze hebben soms het risico voor misinterpretatie, TLC is bovendien niet gevoelig genoeg voor het sporenbereik.

Hulshof demonstreerde aan de hand van farmaceutica dat een intersieve voorzuivering lang niet altijd nodig is.

#### Tentoonstelling

Tijdens het congres was er een tentoonstelling van instrumenten, chemicaliën, boeken en tijdschriften, waar o.a. Labsystems, Perkin Elmer, ARL, Philips, Merck en de grote uitgeverijen als Elsevier en Springer vertegenwoordigd waren. Opvallend was het ontbreken van LKB en diens Finse dochter Wallac Oy.

Perkin Elmer komt met een Zeeman effect oven voor hun model 5000. Volgens deskundigen zou dit apparaat in het optimale gebied werken (in tegenstelling tot het apparaat van Hitachi).

# Scientific Programme

## Opening Ceremony

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*Chairman:* A. Liberti, Italy

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*Chairmen:* H. Malissa, Austria  
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H. Malissa, V. Simeonov

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*Chairman:* A. Hulanicki, Poland

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*Chairman:* K. Ueno, Japan

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- 190 J. A. RODRÍGUEZ-VÁZQUEZ and R. T. Esperon. Further studies on the use of organomercury(II) compounds as reagents for the determination of the chloride, bromide and iodide ions at trace level
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*Chairman:* M. Leskelä, Finland

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- 225p Z. LENGAR. A study of X-ray fluorescence method for the determination of thickness
- 226p P. PUTANOV, M. Genova, R. Marinković-Nedućin, E. Kiss and G. Lomić. Electron microprobe analysis in the study of component interactions in supported catalysts
- 227p D. F. SERMIN. The rapid determination of the concentration of both metallic silicon and silica in pure and impure silicon by means of X-ray fluorescence spectrometry using the "peak shift" phenomenon
- 228p H. SIPILÄ. Portable X-ray fluorescence analyzer
- 229p R. MÄKELÄ, M. Vulli and O. Välttilä. Adsorption of Fe ions on  $\text{Mg}(\text{OH})_2$  crystallites in alkaline solution studied by ESCA

**Poster Session 5: Nuclear Techniques  
— Miscellaneous Instrumental Techniques**

*Chairman:* O. H. J. Christie, Norway

- 230p G. ARDISSON, G. Barci-Funel, J. Dalmasso and H. Maria. Determination of fission nuclides in rain water by X-rays spectrometry
- 231p B. CARMON and S. Levinson. A quick, non-destructive analysis of potassium chloride by the Cherenkov counting of K-40, during its industrial processing from the Dead Sea brine
- 233p T. HATTULA, M. Johanson, J. Paakko and M. Pärssinen. Instrumental neutron activation analysis and board identification
- 234p R. ZILLIACUS. Radiochemical activation analysis of gold in geochemical samples
- 235p I. I. ANTIPOVA-KARATAEVA, Yu. A. Zolotov and N. N. Kazanova. Determination of lanthanide ions in solutions by magnetic circular dichroism spectra
- 236p N. IKONOMOV, N. Kovačić and M. Rekalić. Comparison of analytical results obtained for radio frequency and arc discharges in ethanol vapour
- 237p S. B. NAGY and Mrs. Á. Kiss. The analytical importance of di-electric spectroscopy

**Plenary Session**

*Chairman:* F. Adams, Belgium

- 239 G. RAMENDIK. New developments and current trends in spark source mass spectrometry

**Special Session II. Mass Spectrometry  
in Inorganic Analysis**

*Chairman:* F. Adams, Belgium

- 240 L. S. DALE, I. Liepa, P. S. Rendell and R. N. Whitem. Computer controlled electrical detection system for a spark source mass spectrometer
- 241 G. EHRLICH, U. Stahlberg and H. Scholze. The power of a spark source mass spectrographic universal technique for the analysis of powdered materials

*Chairman:* I. Cornides, Hungary

- 242 A. M. URE and J. R. Bacon. The analysis of biological materials by spark source mass spectrometry: I. Sample preparation, preconcentration and standardisation
- 243 M. VICZIÁN, R. Gijbels and J. van Puymbroek. Formation time measurement of various ionic species in the spark ion source
- 244 A. L. GRAY and A. R. Date. Plasma source mass spectrometry. A new method for inorganic trace analysis
- 245 A. L. GRAY and A. R. Date. PSMS — a discussion of current performance and future potential

### Keynote Lecture

- 246 A. LODDING. Trends and developments in secondary ion mass spectrometry for microanalysis

*Chairman:* A. M. Ure, U.K.

- 247 A. BROEKMAN and J. G. van Raaphorst. The determination of lead and cadmium by isotopic dilution analysis and thermal ionisation mass spectrometry

- 248 O. J. HEINONEN. Studies of some chemical aspects of accurate determination of uranium using a thermal ionization mass spectrometer

- 249 P. J. TURNER, C. Haines, J. Cotterell and J. E. Cattle. Developments in fully automatic thermal ionisation mass spectrometry

*Chairman:* A. Lodding, Sweden

- 251 P. SURKYN and F. Adams. Laser microprobe mass analysis of standard glasses

- 252 R. GIJBELS, J. Verlinden, P. De Bièvre and H. Silvester. SSMS/SIMS study of impurity levels and depth profiles in rhenium filaments; implications for thermal ionisation mass spectrometry

- 253 K. D. KLÖPPEL. Investigation of surface reactions by SIMS: interaction of O<sub>2</sub>, H<sub>2</sub>O, D<sub>2</sub>O, and CO with transition metals

### Food Analysis

*Chairman:* W. Pfannhauser, Austria

- 254 W. G. DE RUIG. Determination of hormones in meat, animal tissues and urine by various methods, with special reference to HPLC/electrochemical detection

- 255 J. K. LIN, Y. J. Lee, T. Z. Horng and L. S. Chang. HPLC determination of naturally occurring primary and secondary amines with dabsyl chloride in foods

- 256 J. K. P. WEDER. Extraction of foods with supercritical carbon dioxide — studies on proteins and amino acids

- 257 P. SCHINDLER. Neutron activation analysis of trace elements in food with special regards to their chemical compounds

- 258 J. K. KAITARANTA and P. J. Ke. TLC-FID in the quality assessment of oils

- 259 F. PALMISANO, A. Visconti, A. Bottalico and P. G. Zambonin. Differential pulse polarographic determination of deoxynivalenol in corn

### Electroanalytical Chemistry

*Chairman:* P. G. Zambonin, Italy

#### Keynote Lecture

- 260 Z. KOWALSKI. Perspective of polarography and voltammetry in analytical laboratory and in process control

- 261 J. D. R. THOMAS, D. L. Jones and G. J. Moody. Potentiometry of ethoxylates

- 262 A. IVASKA, E. Leino and W. F. Smyth. Study on the electrochemical oxidation of some 1,4-benzodiazepines

- 263 M. GRATZL, K. Tóth and E. Pungor. Effect of pH on the potential response of corroding ion selective electrodes

*Chairman:* R. Neeb, F.R.G.

- 265 A. HULANICKI and A. Lewenstam. Variability of selectivity coefficients of sulphide based ionselective electrodes
- 266 R. A. HASTY. Application of the iodide ion selective electrode to dynamic systems in the non-linear response region: study of the reaction between iodate and thiosulfate ions
- 267 E. LINDNER, K. Tóth and E. Pungor. Dynamic response of ion-selective electrodes in the two-ion range
- 268 E. DESIMONI, N. Cardellicchio and P. G. Zambonin. Electro-analytical behaviour of ammonia on platinum, gold and vitreous carbon in alkali nitrate melts
- 269 T. EDMONDS. Polarographic and voltammetric method for the determination of soil nutrient status
- 270 S. RANTAPUSKA. Differential pulse anodic stripping voltammetry with a thin mercury film electrode
- 214 J. VANHUMBEECK, C. Vandenbossche and L. Danneels. Automated end-point detection in titration techniques

## Environmental Analysis

*Chairman:* K. Winsauer, Austria

### Keynote Lecture

- 271 J. SLANINA. Ion-chromatography, a panacea for environmental analysis?

*Chairman:* J. Enqvist, Finland

- 272 A. LIBERTI, P. Ciccio, E. Brancaleoni and A. Cecinato. Simultaneous determination of dibenzo-*p*-dioxins and dibenzofurans in environmental samples by gas-chromatography-mass spectrometry
- 273 W. BUCHBERGER, K. Winsauer and H. Malissa jr. Simultaneous determination of 3-phenyl-4-hydroxy-6-chloropyridazine, ioxynil and bromoxynil in cereals
- 274 L. SAARINEN, E. Nieminen and J. Laakso. Analysis of monomeric isocyanates and some carcinogenic amines in low concentration by HPLC

## Atmospheric Pollutants

*Chairman:* E. Häsänen, Finland

- 275 M. OEHME and H. Stray. Quantitative determination of ultra-traces of chlorinated benzenes and cyclohexanes by GC/MS in high-volume air samples from the Arctic using polyurethane foam as collection medium
- 276 B. VIERKORN-RUDOLPH, K. Bächmann and B. Schwarz. The determination of HCl in the atmosphere by gas chromatographic analysis
- 277 E. B. RIETZ. The stabilization of small concentrations of formaldehyde in aqueous solutions
- 278 G. Torsi, E. DESIMONI and P. G. Zambonin. Electrostatic accumulation furnace for electrothermal atomic spectrometry (EAFEAS) — a general method for fast and precise determination of metals in the atmosphere

**Poster Session 6: Kinetic and Catalytic Methods  
— Extraction and Complex Equilibria**

*Chairman: J. Ruzicka, Denmark*

- 281p B. F. ABRAMOVIĆ and F. F. Gaál. Contribution to the theory of neutralization titrations
- 282p F. F. GAÁL and B. F. Abramović. Comparison of simulated and experimental complexometric catalytic titration curves using indicator reaction periodate-triethanolamine
- 283p F. GARCIA-SANCHEZ, A. Navas and J. J. Laserna. Coupled redox and complex formation processes as a new kinetic-fluorimetric method for trace analysis. Benzyl-2-pyridylketone 2-pyridylhydrazone (BPKPH)/bromate system
- 284p R. A. HASTY and D. W. Hamilton. The determination of molybdenum in brines by a catalytic method
- 285p H. KAGENOW and A. Jensen. Kinetic determinations of alkaline earth metals by stopped flow injection analysis
- 286p E. KUBASZEWSKI. A new reagent for the kinetic determination of copper
- 287p J. KURZAWA. Determination of mercaptopyrimidines by means of induced iodine-azide reaction
- 289p W. PUACZ. A catalytic reaction of sodium azide with iodine in non-aqueous media
- 290p E. SCHWERDTFEGGER. The automated kinetic determination of ascorbic acid
- 291p M. VALCÁRCEL, D. Perez-Bendito and J. L. Ferrer. Utilization of modified catalytic rates: kinetic determination of cyanide and indium
- 294p Z. FRÖBE, V. Drevenkar, B. Štengl and Z. Štefanac. Extraction of dialkyl dithiophosphates by tetraphenylarsonium chloride
- 295p P. J. J. JYSKE and P. O. Lehtonen. Studies on the protonation and copper(II) complex formation of azomethine H
- 296p Da. MALJKOVIĆ, Du. Maljković and S. Paulin. Study of parameters improving chlorometallic acids extraction

- 297p A. NAPOLI. Uranyl complexes with triethylenetetraamine-hexaacetic acid
- 298p R. PETROLA. Formation of lanthanoid(III) complexes of mononitroso-resorcinol in aqueous solution

**Poster Session 7: Spectrophotometry  
— Titrimetry**

*Chairman: M.-L. Sihvonen, Finland*

- 301p S. GÖRÖG and M. Rényi. Derivatization of carboxyl group for the spectrophotometric analysis
- 304p M. ŠIROKI and M. Koren. Extraction and spectrophotometric determination of osmium with 4-(2-pyridylazo)resorcinol
- 305p B. TAMHINA, A. Gojmerac and M. J. Herak. Extraction and spectrophotometric determination of niobium(V) with 3-hydroxy-2-methyl-1-phenyl-4-pyridone
- 306p A. MADEJ, B. Oleksyn and A. Rokosz. Potassium hydrogen 3,5-dinitrobenzoate as a primary standard in alkalimetry
- 307p E. PELIZZETTI and E. Pramauro. Acid-base titrations in micellar systems

**Poster Session 8: Environmental Analysis  
— Food Analysis**

*Chairman: W. G. de Ruig, Netherlands*

- 308p F. W. B. BUGENYI. The copper and cadmium concentration and concentration factors by phytoplankton and other aquatic plants in the Lakes George and Edward, Uganda
- 309p P. G. BYRNE and D. M. Carroll. The use of a prolonged ultrasonification stage in the determination of low levels of airborne asbestos
- 310p E. Caruso, G. M. BRAGA MARCAZZAN and P. Redaelli. Trace element analysis of Milan air particulate matter by PIXE
- 311p S. M. FARROHA, A. E. Habboush and A. M. Al Saeed. Investigation into the direct analysis of phenols extracted from automobile exhaust gases
- 312p M. KHATER, I. Nabieh and E. Farrag. Determination of some trace elements in fresh-water snails and the effect of EDTA & 1,10-phenanthrolinechloride on the metal element
- 313p E. KOZŁOWSKI and E. Sienkowska-Zyskowska. Comparative studies of optimal stripping conditions for volatile halogenated hydrocarbons in water
- 314p M. PERTTILÄ, H. Pyysalo, K. Wickström, R. Litmanen and P. Suuronen. Contents of neutral organochlorine compounds in cod liver
- 315p P. ROUMELIOTIS, W. Liebald and K. K. Unger. Separation and analysis of organic pollutants from diesel engine exhausts by means of high performance liquid chromatography (HPLC)
- 316p M. A. SATTAR. A simple analysis method of MCPA, 2,4-D and 2,4,5-T in soil
- 317p D. SCHULLER, R. Kokuun and B. Schroeter. Determination of volatility of very slightly volatile substances from adsorbed state and out of aqueous solution by routine gas chromatography
- 320p T. VARTIAINEN and P. Kauranen. Determination of fluoroacetic acid in plants by extractive alkylation with pentafluorobenzyl bromide and by capillary column-mass spectrometry

- 321p K. WICKSTRÖM, H. Pyysalo, R. Litmanen, P. Lindström-Seppä, U. Koivusaari and O. Hänninen. Analysis of chlordane, PCB and DDT compounds in fish from the eastern lake area of Finland
- 322p S. BERG. Gas chromatography capillary determination of meat protein amino acids
- 323p E. BROSIO, F. Conti and A. Di Nola. Pulsed low-resolution nuclear magnetic resonance as an analytical tool in the food science
- 324p R. H. DE VOS, A. Schouten and M. A. H. Rijk. The determination of phthalate ester plasticizers in food
- 325p A. DI NOLA, F. Balestrieri, E. Brosio, F. Conti and O. Scorrano. Oil and water determination in olive husk by pulsed low-resolution nuclear magnetic resonance
- 326p H. G. GROHMANN, M. Scheutwinkel-Reich, A. M. Preiss and H.-J. Stan. Analysis of tranquilizers in meat by means of GC and GC/MS
- 327p A. HULSHOFF, O. A. Lake, F. J. van de Vaart and A. W. M. Indemans. The analysis of creams

## Poster Session 9: Clinical Chemistry — Pharmaceutical Chemistry

*Chairman:* S. Görög, Hungary

- 328p R. KNUTTI. Direct determination of lead in urine by Graphite-Furnace AAS
- 329p E. KRAAS, E. Zietz, G. Emons and R. Knuppen. Specific determination of catecholestrogens in tissue and blood by radioenzymatic assay and radioimmunoassay in the lower picogram range
- 330p J. S. SALONEN. Liquid chromatographic determination of mexiletine from blood serum
- 331p S. I. WALTER and A. Picard-Maureau. A semiautomated technique for subsequent determination of triglycerides (TG), total cholesterol (T-C) and HDL-cholesterol (HDL-C) from one 500  $\mu$ l sample
- 332p A. IVASKA and F. Nordström. Polarographic analysis of some cephalosporins
- 333p P.-A. JOHANSSON, U. Stefansson and G. Hoffmann. Potentiometric two-phase titration of amine salts using automatic titrators
- 334p F. NACHTMANN and K. Gstrein. Simultaneous determination of the cationic and anionic part in repository penicillins by HPLC
- 335p B. PERSSON and B. Heimler. Control of dissolution tests in pharmacy using a desktop computer
- 336p S. STAVCHANSKY, J. E. Wallace, E. L. Shimek Jr. and S. C. Harris. Determination of promethazine by liquid chromatography with electrochemical detection
- 337p G. SZEPESI, M. Gazdag, R. Iváncsics, K. Mihályfi and P. Kovács. Investigation of degradation mechanism of pilocarpine by HPLC
- 338p W. J. VAN OORT, J. den Hartigh and K. R. Kooistra. Analysis of the anticancer agent 5-fluorouracil and metabolites in a flowing system

## Plenary Session

*Chairman:* R. Kellner, Austria

- 340 D. HADŽI. Minicomputer coupled infrared spectroscopy — its appreciation as an analytical tool

## IR and Raman Spectroscopy

*Chairman:* Z. Hippe, Poland

### Keynote Lecture

- 341 P. V. HUONG. New analytical possibilities of raman and resonance raman spectroscopy

*Chairman:* E. Hakoila, Finland

- 342 R. HIPPE, J. Fic and A. Kaczmarek. An analytically oriented IR-data base for minicomputers
- 343 H. WEITKAMP. Automatic identity control from pharmaceuticals by computer controlled infrared spectrometry
- 344 R. KELLNER, G. Gidaly, G. Nikolov and N. Trendafilova. FTFIR-spectra and structure changes of metal dithiocarbamates in solid state and in solution
- 345 H. MALISSA jr. Study of the performance of a photo-ionization-detector in GC-FTIR-combination

## Automated and Computer Techniques

*Chairman:* D. Hadži, Yugoslavia

- 346 Z. HIPPE and G. Fic. Preprocessing of raw data for optimized search through library of mass-spectra
- 347 F. W. PIJPERS. Pattern recognition for solving problems in analytical chemistry
- 348 H. N. J. POULISSE. Recursive estimates in multicomponent analysis

## Poster Session 9: Clinical Chemistry — Pharmaceutical Chemistry

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- 346 Z. HIPPE and G. Fic. Preprocessing of raw data for optimized search through library of mass-spectra
- 347 F. W. PIJPERS. Pattern recognition for solving problems in analytical chemistry
- 348 H. N. J. POULISSE. Recursive estimates in multicomponent analysis

- 349 W. WEGSCHEIDER, E. Marageter and K. Müller. Extended error propagation model for heteroscedastic data in multi-element analysis

*Chairman:* J. Kankare, Finland

- 351 D. SAUR and R. Neeb. Evaluation of micro-coulometric current/time-curves by micro-computer
- 352 M. HANGOS-MAHR and E. Pungor. Automated methods for sulphate determination
- 353 H. C. SMIT, H. Steigstra and R. G. Logchies. A micro-mini-mainframe computer network for analytical chemical purposes
- 350 K. B. OLDHAM. Analytical applications of semioperators

## Special Session II. Mass Spectrometry in Inorganic Analysis (contd.)

### Keynote Lecture

- 354 I. CORNIDES. Inorganic mass spectrometry for trace analysis  
*Chairman:* G. Ramendik, U.S.S.R.

## Solution Equilibria and Complex Formation

*Chairman:* A. Ivaska, Finland

- 355 R. A. CHALMERS and D. A. Edwards. Mixed-ligand heteronuclear complexes
- 356 E. BOTTARI and R. Porto. Analysis of equilibria occurring between iron(III) and glycine in 3.00 M (Na)ClO<sub>4</sub>
- 357 J. KRAGTEN. Error reduction by means of pM'-pH diagrams
- 358 A. CABRERA-MARTÍN, R. Gallego-Andreu, R. Izquierdo and J. L. Peral. Separation of mercury(II)/xylenol orange complex by liquid anionic exchanger

### Keynote Lecture

- 360 P. G. BYRNE. Environmental asbestos analysis  
*Chairman:* L. Niinistö, Finland

## X-ray and Related Techniques

*Chairman:* L. Niinistö, Finland

- 361 L. SABBATINI and P. G. Zambonin. Analytical characterization of electrode films by X-ray photoelectron spectroscopy (ESCA). Case of tungsten electrodes in molten nitrates
- 362 M. F. EBEL and N. Gurker. Scanning X-ray photoelectron spectroscopy
- 363 B.-G. BRODDA, D. Herz and U. Wenzel. X-ray fluorescence determination of trace amounts of actinides on electrodeposited samples

*Chairman:* D. M. Carroll, Ireland

- 364 H. EBEL and M. Mantler. An alternative type of X-ray spectrometer
- 365 H. ROBBERECHT, L. Vos and R. Van Grieken. Energy-dispersive X-ray fluorescence for trace element analysis of biological fluids
- 366 A. COLOMBO and F. Bo. Homogeneity verification of powdered candidate reference materials: an approach by X-ray fluorescence for trace elements

## Atomic Absorption Spectrometry

*Chairman:* E. Saari, Finland

- 367 J. LEHTO, J. Kumpulainen, P. Koivistoinen and E. Vuori. Direct determination of chromium in biological fluids by graphite furnace atomic absorption
- 368 E.-L. LAKOMAA, S. Sato and J. M. Frazier. Analysis of copper and zinc by atomic absorption spectrophotometry in subregions of rats' brains
- 369 A. KULDVERE. An indirect method for the determination of iodine by cold vapour atomic absorption utilizing the interfering effect from iodine on mercury

## Poster Session 10: Chromatography

*Chairman:* A. Hesso, Finland

- 372p T. BLEHA and D. Berek. Gel chromatography of polymers. Corrections for solute-solvent-gel interactions
- 373p W. BUTTE. Ternary trialkylselenonium- and trialkylsulfonium-hydroxides for the pyrolytic alkylation of acidic compounds
- 374p F. DONDI. On the stochastic theory of chromatography: Approximation and peak parameters determination
- 375p G. GÜBITZ, W. Jellenz and F. Juffman. Separation of enantiomers by HPLC on chemically bonded chiral phases
- 376p A. E. HABBOUSH, S. M. Farroha and O. F. Naoum. Temperature effect on the structural rearrangements of polyesters (LAC-series) as stationary liquid phases in GLC using aldehydes and ketones as test compounds
- 377p J. HLAVAY, Gy. Vigh and Z. Varga-Puchony. Preparation and use of persilylated glass capillary columns coated with a mixture of OV-1 and FFAP for the analysis of volatile carboxylic acids
- 378p K. HÄSTBACKA, P. Eenilä, E-L. Heino, B. Olin and A. Sivonen. Hydrocarbon-type analysis of heavy petroleum fractions
- 379p E. KOVERO. Gas chromatographic and thin-layer chromatographic analysis of stabilizers of gun propellants
- 380p D. A. MAC DAEID and J. M. Murphy. The analysis of kerosene from fire debris
- 381p S. RANG, T. Saks and O. Eisen. Gas chromatographic purification and identification of  $C_{10}$ — $C_{14}$  normal alkynes
- 382p H. ROSEBOOM, H. A. Herbold and C. J. Berkhoff. Analysis of phenoxycarboxylic acids by gas and liquid chromatography
- 383p C. ROSENBERG. Determination of trace concentrations of phenol in air
- 384p R. M. SMITH and M. Patel. A study of the response of the N/P rubidium bead detector in G.L.C.
- 385p T. SUORTTI and H. Pyysalo. HPLC analysis of amitrole

## Poster Session 11: Special Session II. Mass Spectrometry in Inorganic Analysis (contd.)

*Chairman:* I. Yliruokanen, Finland

- 388p J. R. BACON and A. M. Ure. The analysis of biological materials by spark source mass spectrometry. II. Sensitivity and interferences
- 389p J. CESARIO, Y. Boulin and M. Eglem. Improvement of the accuracy of spark source mass spectrometry by isotope dilution
- 390p L. HILTUNEN and P. Ylinen. The determination of lanthanoid elements by spark source mass spectrometry using electrical detection with peak switching
- 391p R. VANDELANNOOTE, W. Blommaert, R. Gijbels and R. Van Grieken. Hydrogeochemical prospection of Zn-Pb ores using spark source mass spectrometry and neutron activation analysis
- 392p J. C. VAN RAAPHORST and A. Broekman. Thermal ionisation mass spectrometry and isotope dilution. Determination of lead and cadmium in reference materials
- 393p A. VERBUEKEN and R. Van Grieken. Spark source mass spectrometric analysis of biological material
- 394p M. TODORVIĆ, I. Holclajtner-Antunović and M. Zdraveski. The advantages of mass spectrometric analysis of radio frequency plasma

## Poster Session 12: Electroanalytical Techniques — Trace Analysis

*Chairman:* W. J. Kirsten, Sweden

- 395p K. Bogolytsin and J. J. LINDBERG. Polarographic investigations on complex formation of lignophenols in  $NaHSO_3$ — $H_2O$  solutions
- 396p O. S. BORGÉN and O. C. Othman. Difference pulse stripping polarography
- 397p P. L. BULDINI and D. Ferri. Differential pulse polarographic determination of traces of chromium in solar grade silicon

- 398p D. FERRI and P. L. Buldini. Differential pulse polarographic determination of traces of titanium in solar grade silicon
- 401p C. VAN KERCHOVE, R. Bontemps and L. Coclers. Polarographic and I.R. spectrophotometric analysis of clioquinol and some of its homologues
- 404p R. Ch. DANIEL and E. Hänni. Nickel determination in plants and sewage sludges
- 405p L-G. DANIELSSON and S. Westerlund. Clean room container for YMER-80
- 406p M. DERMELJ, H. Polkowska-Motrenko, A. R. Byrne, L. Kosta and P. Stegnar. The determination of selenium in biological materials by radiochemical neutron activation analysis
- 407p Z. GREGOROWICZ. Synthetic dyes as new analytical reagents
- 408p M. J. HERAK, M. Hus and J. Knitel. Determination of ion adsorption on silver halides precipitates by radioactive tracer technique
- 409p N. JORDANOV. On some new applications of pyrazolone for determination of traces of elements
- 410p P. LANZA. Polarographic determination of traces of antimony in silicon
- 411p M-L. RIEKKOLA, O. Mäkitie and M. Ritari. Capillary gas chromatographic separation of traces of nickel(II) and cobalt-(III) diethyl-dithiocarbamate chelates
- 412p G. SCARPONI, G. Capodaglio and P. Cescon. Sample contamination in the determination of trace metals in seawater
- 413p M. WILLEMS, O. K. Borggaard, H. E. M. Christensen and T. K. Nielsen. Determination of cobalt in plant material by solvent extraction — graphite furnace atomic absorption. Interference from Fe, Mn, Zn and Cu

### Poster Session 13: Polymer Analysis — UV and IR Spectroscopy

*Chairman:* A. Hase, Finland

- 414p O. KIRRET. Characterization and identification of polyamide fibers by infrared spectrometric method
- 416p A. LEHTINEN and P. Suominen. Determination of polymer molecular weights by HPGPC using on-line data processing
- 418p W. H. DEKKER. Quantitative multicomponent spectral analysis with a failing Beer's law
- 419p J. HLAVAY, V. Olaszi and J. Inczédy. Investigations on halloysite and zeolite by infrared spectroscopy
- 420p U. MIOČ, M. Todorović, M. Tripković and M. Šaban. Isolation and estimation of porphyrins in some crude oils and oil shales
- 422p L. TURRIO, P. Tittarelli and T. Zerlia. Rapid identification of spilled crude oils by vapour-phase ultraviolet spectrometry