

Book Review

**SPECIAL ISSUE OF
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Proceedings of the 6th International Symposium on Analytical and Applied Pyrolysis,
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This special volume of the Journal contains the invited lectures, papers and posters arranged according to the session of the symposium. About 120 participants from more than 20 countries attended the meeting. The work presents an up-to-date overview of analytical and applied pyrolysis covering the most recent fundamental aspects and experimental developments in this wide-ranging, interdisciplinary field.

Contents: 1. Instrumental and Methodological Developments. Pulse pyrolysis: gas kinetic studies in an inductively heated flow reactor (H. Egsgaard et al.). A study of the thermal degradation of polystyrene-chloroalkane mixtures by thermogravimetry-high-resolution GC (L. Costa et al.). Pyrolysis-GC-photoionization-MS, a new approach in the analysis of macromolecular materials (W. Genuit, J. J. Boon). Atmospheric pyrolysis of carbohydrates with thermogravimetric and MS analyses (A. E. Pavlath, K. S. Gregorski). High-resolution pyrolysis-GC of proteins and related materials (S. Tsuge, H. Matsubara). Cryogenic focusing of pyrolysis products for direct (splitless) capillary GC (T. P. Wampler, E. J. Levy). Influence of pyrolysis parameters on results in pyrolysis-GC (I. Ericsson). 2. Chemistry and Mechanisms of Thermal Degradation Reactions. Pyrolysis of polypropylene in the presence of a halogenated alkane, antimony oxide and a bismuth salt. Some aspects of the degradation mechanism (G. Audisio, A. Silvani). Quantitative analysis of rubber triblends by pyrolysis-MS (R. P. Lattimer et al.). Investigations of polymers by field desorption and fast atom bombardment MS (M. Doerr et al.). Degradative transition of pyrolysis to combustion of a polyurethane at the analytical level (J.-M. Rigo et al.). Preparative pyrolytic reactions (G. Schaden). Effect of heating rate on oxidative degradation of polymeric materials (T. P. Wampler, E. J. Levy). Mechanistic studies on the role of copper- and molybdenum-containing species as flame and smoke suppressants for poly(vinyl chloride) (L. D. Wescott et al.). 3. Exploration and Characterization of Fossil Fuels. Pyrolysis-GC applied to organic geochemistry. Structural similarities

between kerogens and asphaltenes from related rock extracts and oils (F. Behar, R. Pelet). Study of thermal decomposition reactions in coals by pyrolysis-GC-MS (M. Blazso, E. Jakab). Investigations of the volatile matter released from coal employing simultaneous thermogravimetry-differential thermal analysis-MS (K.-H. Ohrbach et al.). Determination of organic sulphur in sedimentary rocks by pyrolysis (M. Madec, J. Espitalie). Curie-point pyrolysis MS, Curie-point pyrolysis-GC-MS and fluorescence microscopy as analytical tools for the characterization of two uncommon lignites (M. Nip et al.). Macromolecular and molecular structure of coal and the possible role of pyrolysis-field desorption MS in its elucidation (A. Marzec). Pyrolysis-GC-MS and thermogravimetric-MS investigation of brown coals (M. Blazso et al.). Volatilization processes during heating of coals and model polymers (N. E. Vanderborgh et al.). 4. Biomass Conversion, Utilization and Characterization. Pyrolytic sources of hydrocarbons from biomass (M. J. Antal et al.). Quantitative MS evolved gas analysis system and its application to cellulose pyrolysis (D. L. Griffiths, R. G. Wright). Pyrolysis field ionization MS of lignins, soil humic compounds and whole soil (K. Haider, H.-R. Schulten). Analysis of polysaccharide pyrolysate of red algae by capillary GC-MS (R. J. Helleur et al.). Characterization of polysaccharides of red algae by pyrolysis-capillary GC (R. J. Helleur et al.). Thermal, morphological, X-ray and spectroscopic studies on cellulose and its esters (R. K. Jain et al.). Fast pyrolysis (Ultrapyrolysis) of cellulose and wood components (L. K. Mok et al.). Flash pyrolysis of tar from the pyrolysis of pine bark (A. Donnot et al.). Application of pyrolysis-GC to the study of the composting process of barley straw and pear-tree wood (A. Seres-Aspax et al.). 5. Thermal Recycling Processes. Recycling of polyolefinic plastics by partial oxidation (H. Bockhorn et al.). Thermal recycling of polymers (W. Kaminsky). 6. Applications in Medicine, Biochemistry and Biology. Application of the laser microprobe mass analyser (LAMMA) of the differentiation of single bacterial cells (R. Bohm et al.). Pyrolysis-GC of phenomelanins (J. P. Dworzanski, M. Debowski). Characterization of marine fulvic and humic acids by pyrolysis-MS (A. Zsolnay, G. R. Harvey). 7. Forensic Applications of Pyrolytic Methods. Comparison and identification of adhesives used in improved explosive devices by pyrolysis-capillary column GC-MS (N. L. Bakowski et al.). Comparison of human hair by pyrolysis-capillary column GC and GC-MS (T. O. Munson, J. Vick). The practical application of pyrolytic methods in forensic science during the last decade (B. B. Wheals). Results of a pyrolysis-MS interlaboratory trial (M. J. Whitehouse et al.). 8. Pyrolytic Studies in Food Chemistry and Tobacco Combustion. Application of pyrolytic methods in food chemistry (W. Baltes). Rapid characterization of tobacco by combined direct pyrolysis-field ionization MS and pyrolysis-GC-MS (J. M. Halket, H.-R. Schulten). Analysis of tobacco

smoke condensate (R. E. Fresenius). Experiences with grade assessment by "condensate predictions" from tobacco pyrolysis (B.-H. Muller). Indexes.

The main 8 Chapters contain the material of 46 lectures. The Chapters are logically grouped and chosen, and they reflect truly the works of the field and show properly the state of art of the research works.

The modern instrument combination is generally used to material investigation: the application of pyrolysis head and GC-MS or the thermogravimetry—(DTA-DSC) and GC-MS tandem combination. The soft fragmentation processes, for instant the application of the photoionization MS to the investigation of degradation of polymers, can advantageously be used in research works.

Instructive is J. Ericsson (page 73), in which he writes about the effect of the experimental conditions of the pyrolysis analyzing the processes with GC.

The 1st Chapter summarizes the modern instruments, tools, while the 2nd one contains the chemistry and mechanism of the thermal degradations.

The comparison of the FD and FAB induced MS-technics to polymer investigation is interesting from those among others.

Chapter 3 reflects clearly, that the investigation of the fossile fuels has again a golden-age. 4–5 papers are dealing in that Chapter with the investigation of coal formation with modern tools.

We can get to know the elaboration of modern subjects in Chapter 4 as well. Namely the research works concerning the biomass are going to have key-interest all over the world. Here we found the modelling of their application and the developing of the corresponding analytical processes. The point was on the technological aspect and the environment protection.

Two papers of Chapter 5 are dealing with the problems of the economic application of polymer wastes and they write about the well usable technologic process to it.

Very nice examples for the analytical application of the pyrolysis process can be found in Chapter 7. Three papers prove the usefulness in forensic application, while in another one the results of parallel measurements made in several laboratories have been evaluated statistically. Finally the conditions, standardization of burning of tobacco, and the difficult product analysis are demonstrated in a paper.

This special issue of the Journal gives a summary of very interesting and useful works. It is natural here, as with every proceeding, that the scientific level and value of the individual papers are different and spreading. But it can be stated, that the papers as a whole are written by very well selected lecturers and authors respectively.

The usefulness of the publication is greatly increased by the carefully edited author and subject register or rather index.

I warmly suggest to purchase the publication for laboratories dealing with thermoanalysis using GC-MS methods especially then, if pyrolysis technique is applied or it will be introduced in the next future. I suggest the publication also for the laboratories dealing with degradation of polymers, decomposition of biomaterials, forensic application and research of fossil fuels. The publication corresponds to the usual high level of *J. of Analytical and Applied Pyrolysis*.

The Proceedings are available in the USA and Canada at: Elsevier Science Publishers Co. Ltd., 52 Vanderbilt Avenue, New York, NY 10017. The rest of the world should order at this office in Amsterdam.

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T. Meisel

Events

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Fourth European Symposium on Thermal Analysis and Calorimetry will be held at the Friedrich Schiller University of Jena, GDR August 23–28, 1987.

Main subjects covered are:

- Instrumentation of thermal analysis and calorimetry
- Theory of thermal analysis and calorimetry
- Inorganic chemistry, glass, ceramics
- Pharmacy, biology, medicine
- Organic chemistry, polymers
- Earth sciences, raw materials
- Solid state reactions

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