

particularly powerful, as they can quantify trace elements in situ. Chemical extraction is not required, as is the case for many other analytical techniques. In the last few years, the potential for X-ray techniques to be applied in the environmental sciences has dramatically increased due to developments in laboratory instruments and synchrotron radiation facilities with improved sensitivity and spatial resolution. In this report, we summarize the principles of the X-ray based analytical techniques most frequently employed to study trace elements in environmental samples. We report on the most recent developments in laboratory and synchrotron techniques, as well as advances in instrumentation, with a special attention on X-ray sources, detectors, and optics. Lastly, we inform readers on recent applications of X-ray based analysis to different environmental matrices, such as soil, sediments, waters, wastes, living organisms, geological samples, and atmospheric particulate, and we report examples of sample preparation.

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Guidelines for unequivocal structural identification of compounds with biological activity of significance in food chemistry (IUPAC Technical Report)

Molyneux, R., Beck, J., Colegate, S., *et al.*
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Isolation of endogenous constituents of foods is generally performed in order to elucidate the biological activity of individual compounds and their role with respect to factors such as organoleptic qualities, health and nutritional benefits, plant protection against herbivores, pathogens and competition, and presence of toxic constituents. However, unless such compounds are unequivocally defined with respect to structure and purity, any biological activity data will be compromised. Procedures are therefore proposed for comprehensive elucidation of food-based organic structures using modern spectroscopic and spectrometric techniques. Also included are guidelines for the experimental details and types of data that should be reported in order for subsequent investigators to repeat and validate the work. Because food chemistry usually involves interdisciplinary collaboration, the purpose is to inform chemists and scientists from different fields, such as biological sciences, of common standards for

the type and quality of data to be presented in elucidating and reporting structures of biologically active food constituents. The guidelines are designed to be understandable to chemists and non-chemists alike. This will enable unambiguous identification of compounds and ensure that the biological activity is based on a secure structural chemistry foundation.

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Polymer Networks: Structure, Properties, and Function

Macromolecular Symposia Volume 385, June 2019

This volume of *Macromolecular Symposia* is based on papers presented at the Polymer Networks 2018 Conference, 17-21 June, 2018, Prague, Czech Republic. The conference was organized together with the 82nd Prague Meeting on Macromolecules by the Institute of Macromolecular Chemistry, Czech Academy of Sciences. The symposium provided an international forum to discuss recent advances and future prospects in the field of polymer networks and gels.

The present collection of papers provides an overview of research advances in several areas of polymer networks and gels as well as their applications. The topics range from new theoretical and experimental concepts to groundbreaking research in the laboratory, such as development of novel and efficient biopolymer materials for medical applications (drug delivery, wound healing, etc.). The design and fabrication of novel polymer compositions and architectures aimed at enhanced functional properties are emphasized in several contributions.

Extract reproduced from the Preface by Ferenc Horkay and Miroslava Dušková-Smrčková.

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