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Nota di contenuto	Refractory Organic Substances in the Environment; Contents; Preface; List of Authors; List of Abbreviations; 1 Setting the Scene; 1.1 The Relevance of Reference Materials - Isolation and General Characterization; 1.1.1 Introduction; 1.1.2 Concept of Standard and Reference Material; 1.1.3 Reference Materials in the ROSIG Priority Program; 1.1.4 Experimental Details; 1.1.4.1 Origin of the Samples; 1.1.4.2 Isolation; 1.1.4.3 Analytical Methods; 1.1.5 Discussion; 1.1.5.1 Mass Balance of the Isolates; 1.1.5.2 Spectroscopic Characterization in the UV and Visible Range; 1.1.5.3 Elemental Analysis 1.1.5.4 Proton and Complexation Capacities1.1.5.5 Size-exclusion Chromatography; 1.1.6 Conclusions; References; Additional References for ROS Literature; 1.2 Element Determination and its Quality Control in Fractions of Refractory Organic Substances and the Corresponding Original Water Samples; 1.2.1 Introduction; 1.2.2 Description of Analytical Methods; 1.2.2.1 Sample Treatment; 1.2.2.2 Flame and Graphite Atomic Absorption Spectrometry (FAAS, GF-AAS); 1.2.2.3 Inductively Coupled Plasma Mass Spectrometry (ICP-MS) 1.2.2.4 Inductively Coupled Plasma Isotope Dilution Mass Spectrometry (ICP-IDMS)1.2.2.5 Instrumental Neutron Activation Analysis (INAA);

1.2.2.6 Total Reflection X-Ray Fluorescence Spectrometry (TXRF); 1.2.3 Results of the Interlaboratory Study; 1.2.3.1 Element Concentrations in ROS Fractions and their Original Samples; 1.2.3.2 Relative Enrichment Factors of Elements in Separated FA and HA Fractions; 1.2.3.3 Quality Control of Analytical Data; References; 2 Structural Investigations  
2.1 Heavy Metal and Halogen Interactions with Fractions of Refractory Organic Substances Separated by Size-exclusion Chromatography  
2.1.1 Introduction; 2.1.2 SEC/ICP-MS System and the Isotope Dilution Technique; 2.1.3 Determination of Heavy Metal-ROS Complexes in Fractions Separated by SEC; 2.1.4 Correlation of Metal-ROS Complexes with other Analytical Data; 2.1.5 Kinetically Stable Cr(III) and Co(III) Complexes of ROS; 2.1.6 Determination of Halogen-ROS Compounds in Fractions separated by SEC; 2.1.7 Conclusions; References  
2.2 Characterization of Refractory Organic Substances and their Metal Species by Combined Analytical Procedures  
2.2.1 Introduction; 2.2.2 Size Distribution and Stability of ROS-Metal Species Assessed by Ultrafiltration, EDTA Exchange, and Atomic Spectrometry; 2.2.3 On-site Characterization of Aquatic Refractory Organic Substances and their Metal Species by Mobile Fractionation and Exchange Techniques; 2.2.4 Conclusions; References; 2.3 Application of Nuclear Magnetic Resonance Spectroscopy to Structural Investigations of Refractory Organic Substances - Principles and Definitions  
2.3.1 Potential of Nuclear Magnetic Resonance (NMR) Spectroscopy for ROS Structure Elucidation

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Sommario/riassunto

Refractory organic substances (ROS) are an essential part of the biogeochemical carbon cycle. Wherever there is life on earth, there will also be ROS in the form of poorly biodegradable leftovers of organisms and as a source for new life. Furthermore, it is now beyond doubt that ROS are closely related to the carbon intensity identified as one of the driving forces in the dynamics of green house gas emission, such that ROS play a key role in sustainable development. 'Refractory Organic Substances in the Environment' provides the results of six years of top-priority research, funded by the

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