DESCRIPTION

This book covers all aspects of bioavailability, as related to environmental contaminants. After a discussion of the definition of bioavailability and its context, focus is placed on the role of risk assessment and bioavailability. Methods of analysis are then discussed including a range of atomic spectroscopic and electrochemical techniques for metal analysis and chromatographic approaches for persistent organic pollutants (POPs). The occurrence, properties and eco-toxicity of POPs and metals in the soil/sediment environment are discussed. Particular emphasis is placed on the uptake of POPs and metals by plants (phytoextraction). Examples of POPs and metals in the environment are reviewed.

Methods to assess the bioavailability of POPs and metals in the environment are discussed. The particular approaches considered are:

- non-exhaustive extraction techniques
- single extraction techniques
- sequential extraction techniques
- use of cyclodextrin and surfactants
- in-vitro gastrointestinal methods including physiological-based extraction test
- the use of bioassays including earthworms.
Finally, selected case studies highlight the importance of determining the bioavailability of POPs and metals.

ABOUT THE AUTHOR

John R. Dean took his first degree in Chemistry at UMIST, followed by an M.Sc. in Analytical Chemistry & Instrumentation at Loughborough University of Technology and finally a Ph.D. and D.I.C. in Physical Chemistry at Imperial College. He then spent 2 years as a postdoctoral research fellow at the Food Science Laboratory of M.A.F.F. in Norwich in conjunction with Polytechnic South West in Plymouth. The work focused on the development of directly coupled high performance liquid chromatography inductively coupled plasma mass spectrometry methods for trace element speciation in foodstuffs. This was followed by a temporary lectureship in Inorganic Chemistry at Huddersfield Polytechnic. In 1988 he was appointed to a lectureship in Inorganic/ Analytical Chemistry at Newcastle Polytechnic (now Northumbria University). This was followed by promotion to Senior Lecturer (1990), Reader (1994) and Principal Lecturer (1998). In 1998 he was awarded a D.Sc. (London) in Analytical & Environmental Science and was the recipient of the 23rd SAC Silver Medal in 1995. He has published extensively in analytical and environmental science. He is an active member of the Royal Society of Chemistry Analytical Division having served as a member of the atomic spectroscopy group for 15 years (10 as honorary secretary), as well as a past chairman (1997-99). He has served on Analytical Division council for three terms and is currently its vice-president (2002-04) as well as chairman of the North East Region (2001-03).

FEATURES

• Up-to-date information on the latest developments in bioavailability of environmental contaminants (persistent organic pollutants (POPs) and metals)

• Covers global regulatory issues

• Case studies to highlight the key aspects of analysis and bioavailability assessment

• Self-assessment questions and worked examples

• As part of the AnTS series, it also contains (series-style) supplementary information, including a glossary of terms, list of acronyms, bibliography and other information, plus provision of literature sources for further reading in individual chapters
SERIES

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