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12 March 2007
Available online 18 March 2007

doi: 10.1016/j.jhazmat.2007.03.047

Environmental Colloids and Particles: Behaviour, Separation and Characterisation, K.J. Wilkinson, J.R. Lead (Eds.), IUPAC Series on Analytical and Physical Chemistry of Environmental Systems, vol. 10 John Wiley & Son, Inc., Hoboken, NJ (2007). 701 pp., Price: US\$ 360.00, ISBN: 0-470-02432-1

This book is the 16th in the *IUPAC Series on Analytical and Physical Chemistry of Environmental Systems*. The main purpose of the series is to make scientists aware of the most important biophysicochemical conditions and processes that define the behaviour of environmental systems. This volume focuses "... on the nature and properties of aquatic colloids and ... the various ... instrumental techniques which can be used for their characterisation." "Colloids, including macromolecules and nanoparticles, are operationally defined entities sized between 1 and 1000 nm in diameter in the aquatic environment."

Given the complexity of the environmental colloids, this book was written in order to:

- identify some of the common problems still needing study in colloid research;
- summarise our current understanding of environmental colloids and their reactions;
- carefully and critically describe a number of important techniques to characterise physical and chemical colloidal properties.

In the Preface, the editors write:

"In spite of decades of research, the precise role of colloids and nanoparticles in environmental systems is still poorly understood. For example, in soils and sediments, colloid-facilitated transport is a well-known, though rarely quantified, process."

"Therefore, this book was written in order to (i) identify some of the common problems still needing study in colloid research (Chapter 1); (ii) summarise our current understanding of environmental colloids and their reactions (Chapters 2 and 3); and (iii) carefully and critically describe a number of important techniques to characterise colloidal physical and chemical properties (Chapters 4–13)."

As noted above, the text has 13 quite long chapters, each of which was written as a "... critical review of the literature with emphasis placed on modern and novel application of techniques that have not been previously examined in detail and those that have seen fast methodological improvements over past decades."

These chapters are:

1. Environmental colloids and particles: current knowledge and future developments.

2. Colloidal properties of submicron particles in natural waters.
3. Colloid–trace element interactions in aquatic systems.
4. Ultrafiltration and its applications to sampling and characterisation of aquatic colloids.
5. Characterisation of aquatic colloids and macromolecules by field-flow fractionation.
6. Modern electrophoretic techniques for the characterisation of natural organic matter.
7. Electrophoresis of soft colloids: basic principles and applications.
8. Strategies and advances in the characterisation of environmental colloids by electron microscopy.
9. Force microscopy and force measurements of environmental colloids.
10. Laser scanning microscopy for microbial flocs and particles.
11. Study of environmental systems by means of fluorescence correlation spectroscopy.
12. Laser-induced breakdown detection.
13. Probing environmental colloids and particles with X-rays.

The editors write in the initial chapter that:

"Over the past 15 years, enormous progress has been made towards an understanding of environmental colloidal systems including the development and application of fractionation and analysis techniques; the development of models; the elucidation of colloidal structure and their interaction with trace elements, nutrients and pathogens; and the impact of colloids on fate and behaviour of the trace elements, nutrients and pathogens."

The book's contents are a combination of practical theory with excellent descriptions of exotic (or at least what seems exotic to this reviewer) instrumental techniques such as: force microscopy, laser screening microscopy, capillary electrophoresis, and field-flow fractionation among others.

In closing, I must note that as an editor I am impressed by the contributors' knowledge and citation of the literature. The volume's contributors exceeded all my expectations by listing almost 3000 articles.

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21 March 2007
Available online 25 March 2007

doi: 10.1016/j.jhazmat.2007.03.058