are published that discuss phytoremediation using trees, stabilization of metal-contaminated ecosystems by grasses, lead-accumulating plants, cycling of trace elements by aquatic wetland plants, metal tolerant plants, plants that accumulate and/or exclude tract toxic elements, and phytomanagement of radioactively contaminated soil.

Sewage sludge, a material of interest to me (having conducted research in this area in years past) is treated in three papers (two of these discussions of sludge, however, are quite brief). Sludge is the residual left after treating wastewater. It has both beneficial segments (nitrogen and phosphorous) and materials of concern (heavy metals). As an agricultural amendment, sewage sludge has value because it supplies nitrogen, phosphorus, and organic solids. But there is concern for the heavy metals that sludge may contain. This topic is discussed by Antoniadis and his colleagues who conduct research at the Institute of Soil Mapping and Classification, National Agricultural Research Foundation, in Larissa, Greece. The authors note (and my research results agree) that "Soil pH is probably the most widely recognized factor affecting heavy metal availability."

This review probably is too brief for the length of the book, but it is very difficult to comprehensively review 33 uniquely different papers that span the entire body of knowledge on how and why plants interact with metals and other trace elements in the environment. As advertised on the back cover, "The book highlights cutting-edge applications of strategies and technologies of the problems of trace elements in the environment."

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3 April 2006

Available online 22 April 2006

doi: 10.1016/j.jhazmat.2006.04.012

J. Gregory, Particles in Water: Properties and Processes, CRC/Taylor & Francis Group, Boca Raton, FL, 2006 (192 pp., Price: US$ 129.95, ISBN: 1-58716-085-4).

Natural waters contain a wide variety of impurities (both dissolved and suspended) that mainly are contributed by the weathering of rocks and soils. But in inhabited areas, contributions from human activities are important. These impurities are first discharged as dissolved ions or particulates. The latter are normally: (1) inorganics, (2) organics, or (3) organisms (living or dead). These particles scatter light and adsorb materials from solution, and if they are microorganisms or viruses, they may be pathogenic. Obviously, their presence in drinking water is undesirable. Removal processes include sedimentation (including centrifugation), flotation (dispersed or dissolved air), or filtration (deep bed or membrane units).

The author ends his first chapter with the following statement:

> "Many of the topics covered in the following chapters are fundamentally important in particle separation processes. Most of the emphasis will be on fairly dilute suspensions, typical of those encountered in water treatment processes, but the basic principles apply to solid–liquid separation in a wide range of industries, including biotechnology, mineral processing, papermaking, and others."

Chapter 2 deals with particle size and related properties including particle size distributions, particle transport, light scattering and turbidity, and particle size measurement.

Chapter 3 covers surface charge which plays a major role in colloid stability and interaction between particles. The most common reason for particles in an aqueous solution to acquire a charge is that its surface has chemical groups that can ionize in water and leave a residual charge on the surface. Surface charge is important because it plays a major role in colloidal stability.

Colloid interactions and colloid stability is the title of Chapter 4. The interactions discussed here are both attractive and repulsive. They are important because they control particle sizes.

The remaining chapters (5–7) are entitled: Aggregation kinetics, Coagulation and flocculation, and Separation methods. Discussed in the first of these chapters, in addition to the kinetics of particle aggregation, are the forms of aggregates and aggregate strength, all of which are of considerable fundamental and practical importance.

Chapter 6, Coagulation and flocculation, discusses the mode of action of some common additives on coagulation and flocculation. Chapter 7, Separation methods, gives an overview of some important solid–liquid separation processes and the principles on which they are based.

The theory pertinent to the science underlying particle processes is well presented by Gregory. However, the numerous equations are not worked out, i.e., no numerical examples are given. The references, although pertinent to the material discussed, seem limited in number with more of them referring to books in the field than to single research papers. I note this only because it is different; it is not to be construed as a criticism.

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3 April 2006

Available online 22 April 2006

doi: 10.1016/j.jhazmat.2006.04.011