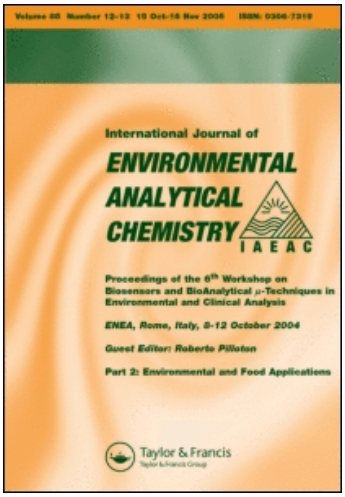

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A Review of: "Aquatic Chemistry (An Introduction Emphasizing Chemical Equilibria in Natural Waters)"

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Book Review

AQUATIC CHEMISTRY (AN INTRODUCTION EMPHASIZING CHEMICAL EQUILIBRIA IN NATURAL WATERS), 2nd Edition, by Prof. Dr. Werner Stumm, Swiss Federal Institute of Technology, Zurich, and Prof. Dr. James J. Morgan, California Institute of Technology, Pasadena, 780 pages (including 97 tables, 167 figures, an appendix of 8 pages "Thermodynamic Properties of Common Chemical Species in Aquatic Systems", an author index of 10 pages, and a subject index of 14 pages), stiff paper cover, format 234 × 161 mm, ISBN 0-471-04831-3, John Wiley & Sons, New York (1981).

The substantially revised edition (the field has grown and matured considerably in terms of data, unifying concepts, techniques, and applications since the first edition ten years ago) is written again for those who share a concern and sense of responsibility for the environment, that is to say for students, researchers, and practitioners. In a systematic way, the book contains a lot of data about the physical chemistry in waters, and gives the basis for the better understanding what short term and what long term interactions take place in aquatic chemistry, expecially in view of inorganic pollutants, but also to a certain extent of organic pollutants. The book is written in a neutral way, and not too much is said about problems in analytical chemistry (from which data are taken), nor about relevance of (biologic) effects. One misses also such terms in the subject index, as abiotic halflife, biotic halflife, degradation, abiotic degradation, photodegradation, elimination mechanisms, ultraviolet. Distribution between water and atmosphere depend for many chemicals on temperature, and this problem should perhaps also be discussed in a new edition (for instance benzene and toluene in artic or in temperate zones).

In spite of these minor gaps, each chapter gives excellent information upon basic chemical principles in natural waters. The reader comes in contact with the crucial kinetic considerations. Each chapter contains a valuable list of references, of further reading suggestions, of problems to be thought over, and of answers to these problems (for instance how one can calculate some data). Chemical equilibrium is the central theme of the treatment, but steady-state and dynamic models using mass-balance

approaches and kinetic information have been given more attention in the second edition. More than 100 numerical examples illustrate the most important aspects of natural water chemistry.

Chapter 11 giving a chemical and ecological perspective on pollution and its control has been added. It is shown how the aquatic ecosystem responds to human impact, especially to stress caused by chemical perturbation. It is clear that people can influence and change global chemical cycles of the environment. Chapter 8, which introduces the subject of organic carbon compounds in natural water systems, is also new. Additionally sea water chemistry (including activity conventions in sea water), reactions at solid-solution interfaces, considerations of metal-ligand interactions, thermodynamic data (free energy, enthalpies, entropies, and equilibrium constants), and the behaviour of stable and radioactive isotopes (also characterizing physical and chemical processes) are discussed in more detail.

The new volume can strongly be recommended to those who want to develop a better understanding of chemical equilibria and chemical reactions in water, and to those who want to learn how to quantify these important functions.

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