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Stumm W & Morgan J J. *Aquatic chemistry: an introduction emphasizing chemical equilibria in natural waters.* New York: Wiley-Interscience, 1970. 583 p.
[Harvard University, Cambridge, MA and California Institute of Technology, Pasadena, CA]

Aquatic Chemistry deals with chemical processes in the water environment. Its aim is to develop a quantitative treatment of key physical chemical variables, both thermodynamic and kinetic, in order to understand natural water composition. The field draws on the fundamentals of chemistry but is also influenced by concepts from other sources, especially geology and biology. [The *SCI*® indicates that this book has been cited in over 1,400 publications.]

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We came to our mutual interest in aquatic chemistry research and our work as coauthors by two rather different paths: through inorganic chemistry and through environmental engineering. Werner Stumm had been a doctoral student with G. Schwarzenbach at the University of Zürich, afterwards joining the chemistry staff at the Swiss Federal Institute for Water Resources and Water Pollution Control (EAWAG) (an institute of the Swiss Federal Institutes of Technology [ETH], Zürich), where he became interested in the chemistry of Swiss waters and the role that fundamental chemistry might play in understanding actual water composition. He moved to Harvard University as a faculty member in engineering and applied physics in 1956 and initiated a chemical research program with an emphasis on rates of corrosion, kinetics of iron reactions, and surface coordination reactions.

The idea for a book that would be useful both for researchers and for teachers in natural water chemistry had already become a long-term goal of the senior author when Jim Morgan materialized at Harvard as a new PhD student in the fall of 1960. A product of Manhattan College and the University of Michigan in civil and environmental engineering, he had a newly acquired appetite for applying chemistry to problems in water quality protection. As a junior faculty member at the University of Illinois, he had been engaged in research on pollution of fresh waters by phosphorus and had developed a strong interest in processes for removing iron and manganese from waters.

In 1960 the time seemed ripe for looking at the chemical fundamentals of natural water systems and for finding out more about the unifying concepts that must underlie their apparent complexity. Lars Gunnar Sillen, a distinguished Swedish physical chemist, had just captured the attention of chemical oceanographers with his stimulating paper on the physical chemistry of seawater.[1] The research of Stumm and G.F. Lee[2] on iron(II) oxygenation had shown success in integrating kinetic and equilibrium concepts in approaching iron dynamics in natural systems.

Our first research together was on particle coagulation, leading to a paper on chemical aspects of coagulation,[3] which argued that *chemical* factors needed greater emphasis in the study of particle behavior in water. That work was personally important to each of us because it opened up lines of research that still remain lively.

By the time Morgan finished his doctoral work (on manganese chemistry in water) in 1963, the idea of the book had evolved with a clear goal: to give a quantitative treatment of the variables that determine the composition of natural waters. We had a wide audience of scientists and engineers in mind, believing that audience existed because of the good reception of an American Chemical Society symposium organized by Stumm in 1966 that led to a proceedings volume widely cited in many related fields, *Equilibrium Concepts in Natural Water Systems*.[4] We decided to call our book *Aquatic Chemistry* to emphasize our general aim, which was to present unifying ideas, especially those of chemical equilibrium, that could be broadly applied to natural systems.

A first edition came out in 1970, the same year in which Stumm returned to Switzerland to become director of EAWAG and a professor at ETH. We have been gratified by the wide acceptance of the book both for teaching and as a research reference work. In part aided by the book, aquatic chemistry as an academic discipline and as a research field has become well established in many universities. The book was translated into Japanese in 1974. Advances in aquatic chemical research on many fronts during the time since the writing of the original edition persuaded us that a new, considerably revised book was called for, and a second edition was published in 1981.[5] A Chinese translation of the second edition came out in 1987. In 1983 our colleague François M.M. Morel of the Massachusetts Institute of Technology brought out his text, *Principles of Aquatic Chemistry*,[6] treating the subject from his own perspective and emphasizing linear-algebraic formulations of aquatic chemical models.

It has been an exciting and satisfying three decades for the authors, seeing research and education in aquatic chemistry expand and be applied in many areas. The field continues to mature, and several generations of students have given us their own views on the book. It seems it will soon be time, once again, for a new edition.

1. **Sillen L G.** The physical chemistry of sea water. (Sears M, ed.) *Oceanography*. Washington, DC: American Association for the Advancement of Science, 1961. p. 549-81. (Cited 175 times.)
2. **Stumm W & Lee G F.** Oxygenation of ferrous iron. *Ind. Eng. Chem.* 53:143-6, 1961. (Cited 105 times.)
3. **Stumm W & Morgan J J.** Chemical aspects of coagulation. *J. Amer. Water Work. Assn.* 54:971-94, 1962. (Cited 90 times.)
4. **Stumm W,** ed. *Equilibrium concepts in natural water systems*. Washington, DC: American Chemical Society, 1967. 344 p.
5. **Stumm W & Morgan J J.** *Aquatic chemistry: an introduction emphasizing chemical equilibria in natural waters*. New York: Wiley-Interscience, 1981. 780 p. (Cited 590 times.)
6. **Morel F M M.** *Principles of aquatic chemistry*. New York: Wiley, 1983. 446 p. (Cited 25 times.)