

# Water Chemistry, Second Edition

By Mark M. Benjamin

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Aquatic chemistry students need a solid foundation in fundamental concepts as well as numerical techniques for solving the variety of problems they will encounter as practicing engineers. For over a decade, Mark Benjamin's *Water Chemistry* has brought to the classroom a balanced coverage of fundamentals and analytical algorithms in a student-friendly, accessible way. The text distinguishes itself with longer and more detailed explanations of the relevant chemistry and mathematics, allowing students to understand not only which techniques work best for a given application, but also why those techniques should be applied and what their limitations are. The end result is a solid, thorough framework for comprehending equilibrium in complex aquatic systems.

The second edition includes a thorough introductory explanation of chemical reactivity and a new chapter on reaction kinetics, providing much-needed context, as well as full treatments of the tableau method and *TOTH* equation. The discussion of the thermodynamic perspective on chemical reactivity has been extensively revised. The entire book now integrates Visual Minteq the most popular software for analyzing chemical equilibria into the problem-solving approach. Additional exercises range more widely in difficulty, giving instructors more flexibility and diversity in their assignments.

### ***Notable features!***

Seamlessly integrates spreadsheet, graphical, and software approaches to solving for the equilibrium composition of a solution.

Demonstrates a simple, intuitive approach for identifying dominant species, and uses that approach to clarify frequently misunderstood concepts related to alkalinity and titrations.

Presents a unique and unified approach to understanding chemical thermodynamics, activity coefficients, redox potential, and electrostatic interactions in adsorption reactions.

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## **Editorial Review**

### **Review**

"Like the First Edition of *Water Chemistry*, the Second Edition remains didactic and written for the student, but with improvements throughout. The book will serve well many future generations of students of water chemistry." --David Dzombak, Carnegie-Mellon University

"Professor Benjamin is one of the best writers in this area. He brings his A-game to this edition. His discussions of how to solve acid/base, precipitation, and redox are exceptionally clear and easy to use. I am particularly appreciative of his lucid yet rigorous discussion of adsorption and the origin of the many isotherms. The connection to Visual Minteq is very helpful to the students, especially those in Environmental Engineering who will one day use the material in their jobs. A hidden jewel, that most will not be aware of, is the answer key with fully worked solutions and clear discussion of how to solve each problem along with in-depth comments about significance, etc." --Mason Tomson, Rice University

"Dr. Benjamin's revisions in the second edition are excellent. The thermodynamics discussion is more on target with the audience. This is the best water chemistry text for upper-level undergraduates and graduate students on the market today." --Paul A. Chadik, University of Florida

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