Preface

Water is an important molecule. Seventy-one percent of the Earth's surface is covered by liquid water, it is the most abundant molecule, and it is a good solvent for polar and ionic substances. Samuel Taylor Coleridge's Ancient Mariner knew this:

Water, water every where,
Nor any drop to drink.

The lack of pure water for drinking purposes and the lack of water sufficiently pure for irrigating the land are major challenges for the human race.

This book offers no solutions to such severe problems. It consists of a review of the inorganic chemistry of the elements in all their oxidation states in an aqueous environment. Chapters 1 and 2 deal with the properties of liquid water and the hydration of ions. Acids and bases, hydrolysis and solubility are the main topics of Chapter 3. Chapters 4 and 5 deal with aspects of ionic form and stability in aqueous conditions. Chapters 6 (s- and p-block), 7 (d-block) and 8 (f-block) represent a survey of the aqueous chemistry of the elements of the Periodic Table. The chapters from 4 to 8 could form a separate course in the study of the periodicity of the chemistry of the elements in aqueous solution, chapters 4 and 5 giving the necessary thermodynamic background. A more extensive course, or possibly a second course, would include the very detailed treatment of enthalpies and entropies of hydration of ions, acids and bases, hydrolysis and solubility.

There are many tables of data in the text and the author has spent much time in attempting to ensure maximum consistency with the various available sources.

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