WATER

A COMPREHENSIVE TREATISE

Volume 1
The Physics and Physical Chemistry of Water

Edited by Felix Franks

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Unilever Research Laboratory
Sharnbrook, Bedford, England

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The Physics and Physical Chemistry of Water

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PINDAR

Preface

Although the Greek philosophers and poets were acutely aware that water plays a very special role in Nature, the attitude among modern scientists has been along the lines of "familiarity breeds contempt." With a very few notable exceptions, the scientific community has taken this liquid very much for granted, and active interest on a significant scale only dates from the early 1960's. Since then progress has been slow, but it has been finite. However, for a triatomic molecule water has presented physicists, chemists, biologists, and technologists with a large number of practical and conceptual problems. The renewed interest in their solution during the past decade has been greatly assisted by the active support of the U. S. Office of Saline Water, but even acknowledging all that has been achieved, we have barely scratched the surface. Perhaps the most significant achievement is that we are now beginning to understand the nature of the problem confronting us.

It is against this background that this volume should be approached, at a time when even simple liquids still present us with many unsolved mysteries. In the various chapters of this book a range of properties of water is discussed and it is in the nature of the general problem that conclusions based on the application of any one experimental technique cannot always be easily reconciled with results derived from the use of another technique. Indeed, some of the interpretations advanced for observed phenomena are by no means universally accepted by the scientific "water community"—this became very evident during the first Gordon Research Conference on Water and Aqueous Systems, held in 1970.

The aims in publishing this volume at this particular time are threefold: to review the physical and theoretical techniques which have been and are being applied to a study of the intermolecular nature of water; to discuss critically the type of information obtainable by these techniques, hopefully

to arrive at some temporary consensus model or models; and to present reliable physical data pertaining to water under a range of conditions, i.e., "Dorsey revisited," albeit on a less ambitious scale.

I should like to acknowledge a debt of gratitude to several of my colleagues, to Prof. D. J. G. Ives and Prof. Robert L. Kay for valuable guidance and active encouragement, to the contributors to this volume for their willing cooperation, and to my wife and daughters for the understanding shown to a husband and father who hid in his study for many an evening. My very special thanks go to Mrs. Joyce Johnson, who did all the correspondence and much of the arduous editorial work with her usual cheerful efficiency.

F. Franks

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Contents

Chapter 5

Raman and Infrared Spectral Investigations of Water Structure

G. E. Walrafen

Chapter 6

Nuclear Magnetic Resonance Studies on Water and Ice

Jay A. Glasel

Chapter 7

Liquid Water: Dielectric Properties

J. B. Hasted

Chapter 8

Liquid Water: Scattering of X-Rays

A. H. Narten and H. A. Levy

Chapter 9

The Scattering of Neutrons by Liquid Water

D. I. Page

Chapter 10

Thermodynamic and Transport Properties of Fluid Water

G. S. Kell

Chapter 11

Application of Statistical Mechanics in the Study of Liquid Water

A. Ben-Naim

Chapter 12

Liquid Water—Acoustic Properties: Absorption and Relaxation

Charles M. Davis, Jr., and Jacek Jarzynski

Chapter 13

Water at High Temperatures and Pressures

Klaus Tödheide

Chapter 14

Structural Models

Henry S. Frank

Contents of Volume 2: Water in Crystalline Hydrates; Aqueous Solutions of Simple Nonelectrolytes

Contents of Volume 3: Aqueous Solutions of Simple Electrolytes

Contents of Volume 4: Aqueous Solutions of Macromolecules; Disperse Systems

Hydration and Aggregation in Aqueous Solutions of Solutions of Small Solutes

The Role of Solute-Water Interactions in Aqueous Solutions and Gels of Macromolecules

Disperse Systems