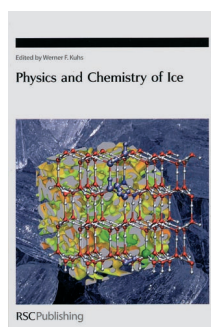


Physics and Chemistry of Ice



Edited by **Werner F. Kuhs**. Royal Society of Chemistry, Cambridge 2007.

704 pp., hardcover
£ 99.00.—ISBN
978-0-85404-350-7

Although the physics of water and ice has been investigated for over 100 years, the subject has lost none of its fascination, and the number of unanswered questions that remain is probably greater than ever. The physical and chemical behavioral characteristics of the water molecule, the complex and unique properties of liquid water, and the many different morphologies of the solid phase are fundamental to the understanding of a wide variety of phenomena in many different areas of science.

This volume collects together the proceedings of the 11th International Conference on the Physics and Chemistry of Ice (PCI 2006), which was held in Bremerhaven in July 2006. It contains 76 individual contributions in which internationally renowned research groups

describe their current research. The topics discussed cover the entire range of this very active field of research. The interdisciplinary character of the field is reflected in the wide variety of topics, which range from astronomy and glacier science to biology. The methods of investigation that have been used range from experimental physics to computer simulations, *ab initio* calculations, and purely theoretical studies. As in previous reports, the physical chemistry of “normal” hexagonal ice is the predominant theme in terms of the numbers of contributions, and that is closely followed by studies on solid hydrates of gases (clathrates). The rest of the articles in this collection are concerned with more “exotic” high-pressure ice phases and with the various amorphous modifications of water.

In the area of studies on normal ice, the focus of interest is on fundamental questions about the structure and dynamics of lattice defects and trapped impurities, and on order/disorder phenomena in the proton lattice. Alongside the traditional spectroscopic techniques, there is now a growing trend towards greater use of molecular dynamics simulations and quantum-mechanical *ab initio* calculations. The trend towards theoretical modeling and computer simulation methods is also evident in geology-related studies on the metamorphism of snow and ice phases, as

shown by the numbers of articles. On the other hand, there is no corresponding trend yet in the field of clathrate hydrates, where the investigation of stability boundaries, growth dynamics, and material transport relies mainly on experimental spectroscopic techniques. The research on these materials, which are also of great technological interest, focuses on clathrates of methane, carbon dioxide, and hydrogen.

As it is a conference report, the book is clearly intended for specialists in the field. The contributions, which are all of high quality, are presented without editorial comment. The extensive and carefully prepared subject index and an index of authors make it easy to seek out information on specific topics. The book is not a substitute for a textbook, nor does it aim to be, but it can be used as a very effective introduction to the current state of ice research. When the book is seen in the context of the nine previous conference reports, which were published at intervals of 4–5 years, it is also an important document in the historical development of this research project over nearly half a century.

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DOI: 10.1002/anie.200785531