

nomena. Many of these are attempts to interpret properties such as dielectric relaxation, conductivity, self-diffusion, and proton spin-lattice relaxation in terms of the migration of defects within the ice I structure. As explained in articles by Onsager, Runnels, and others, these defects are generally viewed as being of three types. The first are the orientational defects first proposed by Bjerrum to account for dielectric polarization and relaxation. These are formed when an H_2O molecule rotates about one of its O-H . . O bonds to create one O-H H-O bond with two intervening hydrogen atoms (*D*-defect) and one O . . O bond with no intervening hydrogen atom (*L*-defect). Second, there are the ionic defects that are formed when a molecule ionizes to H_3O^+ and OH^- . Finally, there are interstitial molecules that are probably responsible for self-diffusion and the spin-lattice relaxation. The detailed atomic structure of the defects, the kinetics of their migration, and the relation of the kinetics to observed properties are all active topics of research.

Other subjects discussed at the symposium include radiation chemistry (two papers), mechanical properties (seven), lattice dynamics (two), thermal phenomena (five), glaciology and meteorology (six), and hydrogen bonding (four). The papers on hydrogen bonding give a wider scope to the volume, and serve as a reminder that the chief importance of research on ice is that ice is a model substance for the study of hydrogen bonds. There are as many hydrogen bonds in ice as covalent bonds, and whatever can be learned about them in this relatively simple substance is of enormous help in understanding the properties of liquid water, biological molecules, and the vast number of other compounds that contain hydrogen bonds.

DAVID EISENBERG

*Department of Chemistry and
Molecular Biology Institute,
University of California, Los Angeles*

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