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This review contains selected values of thermodynamic quantities for the aqueous ionization reactions of 64 buffers, many of which are used in biological research. The thermodynamic quantities which are tabulated are the p$K$, standard molar Gibbs energy, standard molar enthalpy, and standard molar heat capacity change for each of the ionization reactions at the temperature $T$=298.15 K and the pressure $p$=0.1 MPa. The selection of the values of the thermodynamic quantities for each buffer is discussed.



Vibrational state-to-state quasiclassical rate coefficients of the $H_2$+$H_2$ reaction summed over product rotational states for thermalized reactants' rotations and translations are given at various values of the temperature in the range 1000–4000 K. Values are given for both reactive and nonreactive processes. Separate values are also given for processes involving dissociation.



In 1995, the International Association for the Properties of Water and Steam (IAPWS) adopted a new formulation called "The IAPWS Formulation 1995 for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use," which we abbreviate to IAPWS-95 formulation or IAPWS-95 for short. This IAPWS-95 formulation replaces the previous formulation adopted in 1984. This work provides information on the selected experimental data of the thermodynamic properties of water used to develop the new formulation, but information is also given on newer data. The article presents all details of the IAPWS-95 formulation, which is in the form of a fundamental equation explicit in the Helmholtz free energy.



A compendium of sublimation enthalpies, published within the period 1910–2001 (over 1200 references), is reported. A brief review of the temperature adjustments for the sublimation enthalpies from the temperature of measurement to the standard reference temperature, 298.15 K, is included, as are recently suggested values for several reference materials. Sublimation enthalpies are included for organic, organometallic, and a few inorganic compounds.