

Phil. Mag. 48, 46 (1899).—By employing an electrical heating device the thermal conductivity of water is determined. It is proposed to use the apparatus again for comparing other liquids to water.

H. T. B.

On the true density of chemical compounds and their correlation with composition and constitution. *I. Kanonnikoff. Jour. Russ. Soc.* 31, 573 (1899).—The true density D is defined to be the ratio, d/v , where d is the density according to the ordinary acceptance of the term, and v is the volume actually occupied by the molecules. The value of v is found by means of measurements of the index of refraction, n , according to the formula $v = \frac{n^2 - 1}{n^2 + 1}$, so that $D = \frac{n^2 + 2}{n^2 - 1} d$. It was found that the true density varied but little with changes in the state of aggregation of a substance, and that its variation with the temperature could be expressed by means of the equations $D_t = D_0(1 \pm kt)$, the plus sign applying only to water, and the constant K varying with the nature of the substance. A large number of substances were examined, and empiric formulas established for several series of organic compounds.

C. E. L.

On the expansion of porcelain with rise of temperature. *T. G. Bedford. Phil. Mag.* 49, 90 (1900).—A determination of the linear expansion of porcelain after the method used by Callendar, and Callendar and Griffiths for glass.

H. T. B.

Two-Component Systems

On the formation and change of mix-crystals of sodium nitrate with potassium nitrate and with silver nitrate. *D. J. Hissink. Zeit. phys. Chem.* 32, 537 (1900).—Contrary to the assumption of Carveth (2, 209) potassium and sodium nitrates form two series of mix-crystals. At ordinary temperatures the amount of each that will dissolve in the other is only about one-half of one percent. At the cryohydric point, 218°, the two sets of crystals contain 24 and 85 molecular percents of potassium nitrate respectively. [This makes the abnormal lowering of the freezing-point more, not less, surprising.] Presence of sodium nitrate lowers the inversion temperature of potassium nitrate; but accurate data could not be obtained by the thermometric method.

All mixtures of silver nitrate and sodium nitrate have freezing-points lying between those of the pure components. At 217.5°, there is a quadruple point, two sets of solid solutions being in equilibrium with solution and vapor. The melt always contains more silver nitrate than the crystals in equilibrium with it. The sodium nitrate crystals contain 38 molecular percent of sodium nitrate at 217.5°, and 64.4 percent at 15°. The silver nitrate crystals contain 26 molecular percent of sodium nitrate at 217.5°, 4.5 percent at 138° where the rhombic crystals begin, and 1.6 percent at 15°. The inversion temperature of silver nitrate is lowered from 159.8° to 138° by the addition of sodium nitrate. At the latter temperature, 138°, there is therefore a quadruple point with three solid solutions in equilibrium and vapor.

W. D. B.

Iron and steel from the standpoint of the phase rule. *H. W. Bakhuys Roozeboom. Zeit. phys. Chem.* 34, 437 (1900).—The author discusses the tem-