## SOLUTIONS

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of accuracy. The expansion of water was taken, according to his observations, to be  $0.0_8878$  for the same interval.

Brückner's observations of viscosity were made at 15° C.; but he gives an interpolation formula, applicable between 15° and 20°, by means of which at least approximate values for 18° were obtained. His values for water at 15° and 20° do not agree well with those given by Landolt and Börnstein. I have therefore taken 0.010613 as the viscosity at 18° of the water used by him, a value which has to his value at 15° the same ratio as Landolt and Börnstein's for the same temperatures. The actual concentrations of Brückner's solutions differed from those given in the tables below by about 0.1 per cent.; but so small a difference could produce no appreciable error in the result. He gives as his "mean probable crror of observation,"  $\pm 2.4$  in the fifth place of decimals for sodium-chloride solutions, and  $\pm 1.8$  for those of potassium chloride.

Rother's observations of surface-tension were made at 15° and are therefore not precisely comparable with calculated values based on the values of ionization-coefficients for 18°. From Kohlrausch's data,\* however, it would appear that between 15° and 18° in the case of potassium-chloride solutions containing 0.5 and 3 gramme-molecules per litre, the ionizationcoefficient changes only by about 0.13 and 1.3 per cent. respectively; and in the case of sodium-chloride solutions of the same concentrations only by about 0.4 and 0.6 per cent. respectively. For the more dilute solutions, therefore, my calculations will be practically comparable with Rother's observations. He seems to regard his determinations as possibly in error by  $\pm 5$  to 8 in the the third place of decimals. The surface-tension of the water he used he found to be 7.357.

Bender's observations of refractive index were made at  $15^{\circ}$  C., but were reduced to  $18^{\circ}$  by means of data provided in his paper, based on observations made by Fouqué†. The refractive index of the water he used he found to be 133310

<sup>\*</sup> Wied. Ann. xxvi. (1885) p. 223.

<sup>+</sup> Compt. Rend. ixiv. (1867) p. 121.