

Abstract

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In this work, density and osmolality of isotonic solutions of sodium chloride and glucose and their mixtures was measured in the molal and / or molar concentration, respectively. Osmolality was directly proportional to the increasing concentration of substance, but this is true only for solutions themselves substances; osmolality was affected by the ratio of sodium chloride and glucose in mixtures. The density of the solutions was measured at 20°C and 25°C, the average density at 20°C was used for the conversion of molality to molarity and vice versa, to estimate the osmolarity and to estimate the partial specific volume V_g (ml/g) and molal volume V_{mol} (ml/mol) of the solute. Partial specific volume and molal volume of glucose not relate directly to concentration of substance while decreased for sodium chloride with decreasing concentration of substance. Resulting value V_g and V_{mol} for mixtures of both compounds were affected by the concentration and the ratio of the two components in the mixture.

Out of the three methods outlined in USP, the method using experimentally determined the partial specific volume V_g (ml/g) of the solute was found to be best for estimation of osmolarity.