Abstract

Amount of the dissolved substances in parenteral solutions is expressed in molarity ($mol \cdot l^{-1}$). To express the osmotic effect of the dissolved particles in one litre of solution, osmolarity ($mosmol \cdot l^{-1}$) is used. Physical measurement is provided by an osmometer. However, by this measurement we can determinate osmolality ($mosmol \cdot kg^{-1}$) which depends on the concentration in molality ($mol \cdot kg^{-1}$). Mutual conversion between osmolality and osmolarity is then desirable. The conversion of molality to molarity requires a knowledge of the volume of the solution whereas the conversion factor is wanted to convert molarity to molality. Conversion factor, in fact, expresses content of water in the solution. The mutual conversion between molality and molarity requires knowledge of the solution density. In this work, the effect of temperature in range of 15-40ºC on density of the aqueous solutions was studied. Aqueous solutions of sodium chloride, potassium chloride and ammonium chloride in concentration range of 0,1 - 1,0 $mol \cdot l^{-1}$ or 0,1 - 1,0 $mol \cdot kg^{-1}$ were investigated. Relationship between the solution density and temperature was described with quadratic equation regressions. The solution density was directly proportional to the solution concentration at 20ºC. Using the average density at 20ºC, the mutual conversion between molality and molarity was realized. The relationship between molarity and molality was described due to the generated linear regressions with coefficients of determination in range 0,9999 - 1,0000.