

ABSTRACT

Charles University in Prague, Faculty of Pharmacy in Hradci Králové

Department of Pharmaceutical Technology

Consultant: Doc. PharmDr. Zdeňka Šklubalová, PhD.

Student: Lucie Kmoníčková

Title of Thesis: Osmolality of parenteral preparations. Sodium chloride.

The objective of this diploma theses was to study the relationship between the concentration of aqueous solutions of sodium chloride and the solution density and osmolality. Solutions of sodium chloride were prepared in molality and/or molarity in range of 0.01 to 0.2 mol/kg and/or mol/l, respectively. The solution densities were measured using a densimeter in temperature range of between 15 and 40°C. The dependence of the solution density on temperature was described by the quadratic regresions with the coefficient of determination ranging from 0.9998 to 1.0000. At constant temperature, the direct proportion between density and the solution concentration was observed. The average density of solutions at 20 °C was used for mutual conversion between molality and molarity. Osmolality of the molal and/or molar solutions of sodium chloride was directly proportional to the concentration. Using the methods listed in USP, osmolarity of the sodium chloride molar solutions was expressed. No differences in the accuracy of the investigated methods of osmolarity estimations were detected in the studied concentration range of 0.01 - 0.2 mol/l. Finally, the molal osmotic coefficient was expressed the value of which decreases as the molal concentration increases.