

Measurement and Correlation of Surface Tension for Single Aqueous Electrolyte Solutions

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In this work, the values of the surface tension for a number of single aqueous electrolyte solutions were measured and reported at various temperatures and electrolyte concentrations using the well-known and computer aided pendant drop method. In order to conduct the experimental measurements, the high pressure and high temperature IFT-700 apparatus equipped with a view cell and a computerized data acquisition system was used. The systems studied in this experimental work are aqueous solutions of KCl, NaCl, MgCl₂, Na₂SO₄ and AgNO₃. The experiments were replicated three times for each electrolyte system at each temperature and electrolyte concentration and the results reported are the average of replicas. The pooled standard deviation of the experiments was also reported. It should be noted that the results showed that while the surface tension for electrolyte solutions increases as the electrolyte concentration increases, it decreases with increase in temperature as expected. Finally, the data reduction was done using an empirical equation to show the effect of both temperature and electrolyte concentration on the surface tension for the systems studied.