

Electrical Conductivity and Viscosity of Nigerian Traditional Soaps in Non- aqueous Solvents.

Adebajo, Moses Olorunfemi

M.Sc. Chemistry

Department of Chemistry

Obafemi Awolowo University, Ile Ife, Nigeria

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Abstract:

The electrical conductance and viscosities of different concentrations of alcoholic solutions of Nigerian traditional soap are measured as a function of temperature. Sodium, potassium and potassium/sodium (50:1) soaps are prepared from palm kernel oils using laboratory reagent alkalis. Their conductances are also measured. While the conductance values vary with the state of purity of the soaps and the polarity of the solvents, no significant change is observed in viscosity in relation to their purity.

The conductances of the prepared potassium soaps are found to be higher than those of the prepared sodium soaps, suggesting the metal ions to be the main charge carriers. The plots of logarithm-of conductivity against inverse temperature for all the soaps are linear in Methanol and ethanol while such plots are non-linear in 1-propanol, a solvent in which the soaps are least soluble with low conductance values. However, the plots of logarithm of viscosity against inverse temperature are linear for the soaps in all the alcohols within the range of the concentration studied.

Data are presented for both the activation energy for viscous flow and conductance. In each case, the energy values appear to increase with the molecular weight of the solvents. The viscosity data are fitted to the Jones-Dole equation and the A and B-coefficients are evaluated. The trend of the values of the B-coefficients with temperature and polarity of the solvents is discussed. The removal of excess acid/base/water appears to enhance the foaming capability of the soaps. Some other undetermined minor or trace impurities seem to have little or no effect on the foaming efficiency of the traditional soaps.

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