

Volumetric and transport properties of AOT/n-heptane/DMSO-water reverse micellar systems

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Volumetric and transport properties of sodium bis(2-ethylhexyl) sulfosuccinate (AOT)/n-heptane/dimethylsulfoxide (DMSO)-water reverse micellar systems have been investigated using the methods of densitometry and viscosimetry. The investigation of such systems is important, because they are considered to be models of membranes, due to some structural similarities with biological membranes. Therefore the exploration of these systems by different physicochemical methods is significant.

The purpose of this work is to reveal the changes of both the apparent molar volume of polar phase and the viscosity of the system, when the mixed solvent DMSO-water is used as a polar phase instead of water.

It may be assumed from the results that the apparent molar volume of polar phase increases in the presence of DMSO comparing with water [1]. Probably the reason of the increase of apparent molar volume is strong DMSO-water interaction, which results the weakening of rival interaction between molecules of polar phase and surfactant.

The observed results also show that, with high concentration of AOT the dependence of relative viscosity of system from the volume fraction of micelles is nonlinear. Moreover in the presence of DMSO the deviation from linearity is more expressive, than in the case of pure water [2]. It may be explained by the departure of the micelles from a spherical shape and by forming more complex micellar aggregates.

1. A. D'Aprano, I.D. Donato, M. Goffredi, V.T. Liveri, J. Sol. Chem. 21 (4), 1992, p. 323.
2. A. Ruggirello, V.T. Liveri, J. Chemical Physics, 208, 2003, p.187.