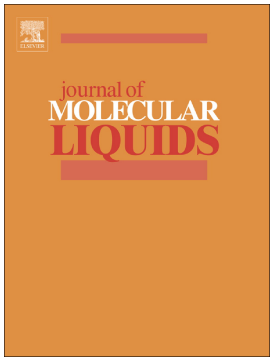

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Effect of chain length of oil on location of Rhodamine B in the AOT nano-droplet microemulsions at constant water content

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Abstract

In this work, effect of chain length of oil from C-10 (n-decane) to C-5(n-pentane) as continuous phase of AOT microemulsion on the droplet size and location of hydrophilic dye of Rhodamine B (RhB) in the water/AOT/oil microemulsions was studied at the water-to-AOT molar ratio of 40 by means of dynamic light scattering (DLS) and fluorescence spectroscopy. The results of dynamical study of AOT micelles by using DLS technique showed that by increasing the chain length of oil in the AOT microemulsion, the droplet size increased and the interactions between nano-droplets were more attractive as a function of the mass fraction of nano-droplets (MFD). It was also observed that hydrophilic dye of Rhodamine B can be located in the continuous phase of microemulsion because of the surfactant-dye electrostatic interactions and the number of formed AOT-RhB ion pair complex in the continuous phase of AOT microemulsion increased as the chain length of oil decreased.