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Effect of addition of aliphatic alcohols on the transformation towards one dimensional aggregate of anionic-cationic surfactants mixtures

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The specific characteristics of the rheological behaviors that exhibited by the aqueous solution of wormlike micelles promise their important employment that applied in various aspects. These properties are released from the thermodynamically controlled supra-molecular structure of the self-assembled amphiphilic molecules which referred as living polymers. Actually, there is only poor effort concerning the theoretical background of the formation of these one dimensional (1D) supra-molecular aggregates. Recently, we have developed a new physical insight that called Critical Intermolecular Forces (CIF) for interpreting the formation of wormlike micelle. This theory (CIF) is surprisingly stated that the hydrophobic effect plays the major role in the formation of 1D as never mentioned in the previous studies. CIF is considered as a helpful tool for interpreting and understanding the transformation to 1D in addition to the accompanied jell state and helpful for predicting a new wormlike system. Two studies were followed for supporting CIF theory. As a continuing to our previous investigations, a study of the effect of addition of aliphatic alcohols on the transition process towards 1D seems to us interesting. The presence of both of hydrophilic hydroxyl and hydrophobic hydro-carbonic groups in these substances may disturb the critical intermolecular forces and even could change the transition mechanism. Interestingly, the results show there is no effect of these alcohols on the ratio of viscosity sharp peak due to presence of 1D which remains at 80/20 CTAB/SDS as clearly shown. This phenomenon indicates that the presence of these alcohols do not involve in the mechanism of the transformation from 3D to 1D which gives support to the already proposed CIF theory. The results also show that the presence of these alcohols increases the tendency of the formation of 1D except that of octanol.

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