

Phase behavior of oleyl oleate with nonionic surfactants

ABSTRACT

Oleyl oleate (OE), a liquid wax ester, has been reported as a potential raw material for cosmetic and pharmaceutical uses but little is known about its phase behavior in ternary systems. Two types of nonionic surfactants were selected, namely, Tween-60 (T60) and Span 20 (S20). Phase diagrams of OE/T60/water and OE/S20/water systems were constructed at $25.0 \pm 0.5^\circ\text{C}$. Ternary phase diagrams of OE/T60:S20 (20:80 and 60:40)/water systems were then constructed at the same temperature. The ratios of 80:20 and 60:40 of T60:S20 were selected due to different solubility points of the surfactants in water. The results showed that the oleyl oleate with mixed surfactants system, OE/T60:S20 (20:80 and 60:40)/water, gave better performance than the individual surfactant systems. The high percent of T60 of 80:20 in the T60:S20 system contributes to enlargement of the isotropic region. In contrast, by increasing the percent of S20 of 60:40 in T60:S20 contributes to a larger liquid crystalline region.

Keyword: Oleyl oleate; Liquid wax ester; Nonionic surfactant; Phase behavior