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Oil-in-water nanoemulsions stabilized by vixtures of nonionic surfactant

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Abstract

The phase inversion temperature method was used for nanoemulsion preparation. Nanoemulsions were stabilized by the mixtures of nonionic surfactants: Tween 60, Tween 80, Span 60, Span 80, Cremophor EL, and Solutol HS15. At volume ratios of Tween/Span 2.0-2.4 nanoemulsions with droplet sizes of the dispersed phase equal to 15-30 nm were formed. In the case of stabilization by mixtures of Solutol HS15/Span 60 or Cremophor EL/Span 60 the formulation of nanoemulsions with 20-35 nm droplets occurred in a wider range of volume ratios of surfactants – 0.5-2.5.

Nanoemulsions with surfactants solid at the storage temperature were the most stable. Droplet sizes remained almost unchanged for 20-25 days. This can be explained by the formulation of the solid adsorption layer on droplet surface which prevented coalescence and retarded Ostwald ripening in such colloidal systems.