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Small-angle scattering study on the lecithin stabilizer layer structure in tetracosane-water nanoemulsions and -suspensions

The interfacial stabilizer layer in lipid emulsions and suspensions controls the lipid oxidation of encapsulated bioactive compounds and the crystallization of the nanoemulsions. As a model system tetracosane (C24 alkane, TCS) nanodispersions stabilized by the lecithin 1,2-dimyristoyl-sn-glycero-3-phosphocholine (DMPC) was considered here. The emulsion droplets (about 65 nm in diameter, as measured by photon correlation spectroscopy) exhibit a strong super-cooling (ΔT about 20 K) and crystallize in an for TCS unusual orthorhombic crystal structure (space group Pca21 as verified by wide-angle x-ray scattering).

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