

Producing a lycopene nanodispersion: the effects of emulsifiers

ABSTRACT

In the present work, the effect of the emulsifier type, namely Tween 80 (T80), lecithin, sodium caseinate and gum arabic, on the physicochemical properties of lycopene nanodispersions was investigated. A lycopene nanodispersion was produced by emulsification-evaporation method. The lycopene nanodispersion exhibited different physicochemical properties with different types of emulsifiers. The smallest particle size and the highest transmittance of lycopene nanodispersion were obtained by using Tween 80 followed by lecithin, sodium caseinate and gum arabic. The lycopene nanodispersion produced from lecithin was the most stable, exhibiting the lowest polydispersity (PDI) value, narrow and monomodal distribution and high zeta potential value. Sodium caseinate retained the highest lycopene concentration among all the emulsifier types. Transmission electron microscopy (TEM) micrographs revealed sphere-shaped lycopene droplets at different sizes depending on the types of emulsifier used. The results from this study provide useful information to produce desirable properties in lycopene nanodispersions for food applications.

Keyword: Emulsification-évaporation; Small molecule surfactant; Large molecule emulsifier; High pressure homogenization; Particle size