α-tocopherol nanodispersions : preparation, characterization and stability evaluation.

ABSTRACT

A top down approach based on emulsification–evaporation technique was used to prepare nanodispersion of α-tocopherol. Physicochemical properties of the prepared nanodispersions were investigated under combination of the processing parameters (pressure and cycle) and ratio of aqueous:organic. Storage study was performed for 3 months to evaluate the stability of all the prepared nanodispersions. The results showed that homogenization pressure have significant ($P < 0.05$) influence on the droplet diameter and size distribution. On the contrary, the processing cycle had not significant ($P > 0.05$) effect on the droplet diameter and size distribution of the prepared nanodispersion. Droplet diameters in the range of 90–120 nm were obtained for the prepared α-tocopherol nanodispersions. During storage duration, there were no significant ($P > 0.05$) changes in mean diameters while the concentrations of α-tocopherol were significantly ($P < 0.05$) reduced for all prepared nanodispersions. In general, it is shown that emulsification–evaporation technique can be used as a suitable technique for the production of α-tocopherol nanodispersions with narrow size distribution.

Keyword: α-Tocopherol; Nanodispersion; High-pressure homogenization; Emulsification–evaporation; Physicochemical properties; Storage stability.