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Biophenols-loaded solid lipid particles (SLPs)
development by membrane emulsification

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Abstract

The present study investigates the preparation of biophenols-loaded solid lipid particles (SLPs) using the membrane emulsification process. This study involves two main novelties: the first is the encapsulation of amphiphilic/hydrophilic bioactive compounds in the hydrophobic matrix and the second is the use of cold membrane emulsification for the production of SLPs. The main objectives of this work were: i) to investigate the process parameters influencing the encapsulation efficiency in SLPs, (ii) to compare the membrane emulsification technique with conventional emulsification methods and (iii) to identify the operative conditions that allow to produce highly concentrated SLPs with improved encapsulation efficiency and low energy consumption. The influence of lipid phase compositions (cocoa butter, cocoa butter/ethyl acetate (4:1)) and the temperature of operation on the SLPs size, encapsulation efficiency and energy consumption was investigated. The membrane emulsification process allowed producing uniform particles with mean size corresponding to 3.6 times the pore size of the membrane. The encapsulation efficiency of hydroxytyrosol, an amphiphilic compound with antioxidant properties of the olive biophenol family, was about 2 times higher than with the homogenizer when the process was carried out at 40°C. The high solidification rate

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