Formulation of Span 80 niosomes modified with SDS for lactic acid entrapment

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ABSTRACT

This study examines the effects of different formulation parameters on the physico-chemical properties of niosomes containing Span 80 (sorbitan monooleate), cholesterol and/or SDS (sodium dodecyl sulfate), and lactic acid for the future use of formulated niosomes as lactic acid extraction agents in aqueous solutions. Niosomes were prepared by direct ultrasonication of the aqueous samples containing all the aforementioned components. Results revealed that SDS acts as a niosome stabilizer that can be used as a substitute of cholesterol, because it increased the zeta potential absolute value while decreased the particle size. Additionally, SDS also increased the lactic acid entrapment efficiency, which indicates that Span 80 niosomes modified with SDS can be used as selective extraction agents for lactic acid present in aqueous solutions at low concentrations. The best formulation, based on niosome stability and maximum lactic acid entrapment efficiency, was obtained for 20 mol/m³ of Span 80 + 2 mol/m³ SDS + 10 mol/m³ lactic acid, leading to niosomes with 36% of lactic acid entrapment efficiency, −47 mV of zeta potential, and 156 nm of hydrodynamic size.

Keywords: Niosomes; Ultrasonication; Lactic acid; Span 80; SDS; Centrifugal ultrafiltration

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