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Preparation and characterization of microparticles of β-cyclodextrin/glutathione and chitosan/glutathione obtained by spray-drying

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Abstract

Reduced glutathione (GSH) is an efficient antioxidant on limitation of browning, of the loss of aromas and off-flavor formation in white wines. The encapsulation of GSH in a polymer system to be added in white wines may prolong its antioxidant action. The aim of this work was to prepare and characterize spray-dried microparticles using β-cyclodextrin (β-CD) or chitosan as polymers for encapsulation of GSH for its addition to wine to prevent oxidation. The microparticles obtained after the drying process were characterized regarding morphology, chemical interacction betwen GSH and polymers, thermal stability, microstructure, encapsulation efficiency and in vitro GSH release. SEM showed spherical microparticles, with wrinkled surfaces for β-CD/GSH and smooth surfaces for chitosan/GSH. A wide distribution of particle size was observed. In general, β-CD/GSH showed an average diameter smaller than the chitosan/GSH microparticles. FT-IR showed a possible interaction between GSH and both polymers. DSC and DRX showed that encapsulation process produced a marked decrease in GSH crystallinity. The encapsulation efficiency was 25.0%