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## Submicrometric hypromellose acetate succinate particles as carrier for soy isoflavones extract with improved skin penetration performance

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### Highlights

HPMCAS 912 based nanoparticles can be produced by nano spray drying

Soy isoflavones extract can be efficiently encapsulated into HPMCAS nanoparticles

HPMCAS 912 can avoid recrystallization of active ingredients during processing and storage

HPMCAS 912 is able to enhance soy isoflavones penetration through artificial skin membrane

### ABSTRACT

In this study, hypromellose acetate succinate (HPMCAS) stable submicronic particles loaded with a soy isoflavones extract, have been obtained by nano spray drying technology. HPMCAS has been used as excipient able to increase both stability and supersaturation levels of the active ingredients hence able to enhance skin penetration performance of genistein and daidzein. The influence of polymer/extract ratio as other process variables, on particle size, morphology and permeation performance, have been investigated. Particles in submicronic range (mean size around 550 nm) and narrow size distribution with high encapsulation efficiency (up to 86%) were obtained. HPMCAS was able to improve amorphization of genistein during the atomization process and avoid recrystallization of during storage, even in harsh environmental condition. Moreover, the enhanced affinity of the optimized formulations with aqueous media, strongly increased isoflavones penetration through membrane with diffusive properties well-correlated to human skin, up to 10-fold higher than pure soy isoflavones extract raw material.

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