

SOLID LIPID NANOPARTICLES FOR DELIVERY OF CALENDULA EXTRACTS

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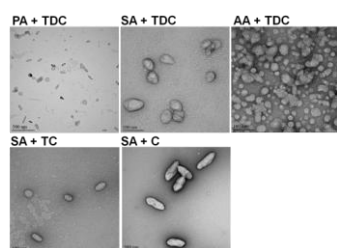
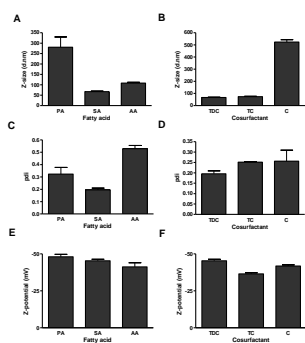
Abstract

Unfortunately, many promising drugs present low water solubility, poor absorption or unfavorable elimination from organisms. Thus, the development of new drug delivery systems in order to improve drug bioavailability has been highlighted. Among the different strategies in this field, Solid Lipid Nanoparticles (SLN) have emerged as some of the most promising nanocarriers for controlled drug delivery which can improve drug bioavailability and targeting. SLN are submicron-sized dispersions of solid lipids that should be solid at room and body temperatures. They are composed by a central solid lipid core and a surfactant (and cosurfactant) which helps the assembling of the lipophilic components in an aqueous solution. SLN present many advantages in comparison to other drug delivery systems. They are able to incorporate hydrophilic and lipophilic drugs, present no biotoxicity and their production can be easily scaled up [1,2]. Their size and liposolubility facilitates drug diffusion through some biological barriers [3]. In this work we have tested solid lipid nanoparticles (SLN) composed of long-chain fatty acids, Epikuron 200, and bile salts using microemulsion technique [4]. Different SLN dispersions were characterized by photon correlation spectroscopy, differential scanning calorimetry and transmission electron microscopy. Faradiol content was quantified using HPLC-DAD and the β -carotene using UV-VIS spectrophotometry measures. The capacity to incorporate calendula extracts with healing properties [5] was also studied in the most promising SLN composition. Our results suggest that selected SLN are appropriate delivery systems for this type of compounds.

References

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Figures



Composition, in addition to Epikuron 200	T _m (°C)	ΔH (kcal/mol)
PA + TDC	60,304	19757,327
SA + TDC	67,404	20715,741
AA + TDC	60,654	12765,040
SA + TC	72,480	12018,899
SA + C	66,469	25467,607
SA + C	67,495	12602,094

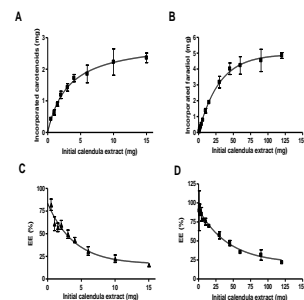


Figure 1. SLN characterization of the selected lipid compositions. Particle z-average size (A and B), polydispersity index (C and D) and Zeta potential (E and F) were measured with Dynamic Light Scattering (Malvern Zetasizer Nano S)

Figure 2. TEM micrographs of studied SLN. Samples were stained with uranyl acetate and images are representative of two independent experiments.

Table 1. Thermal properties of analyzed SLN. Data obtained from DSC measurements. Average values from two closely similar measurements.

Figure 3. Incorporation rate and entrapment efficiency of carotenoids and faradiol esters in SLN. Faradiol content was measured by HPLC and carotene content was measured by UV-Vis spectrophotometry. Results are expressed as the mean \pm SEM of at least three independent experiments.