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LIPID-CORE NANOCAPSULES CONTAINING DIFFERENT SOLIDS LIPIDS AND OILS: STUDY OF PARTICLE SIZE DISTRIBUTION AND PHYSICAL STABILITY

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Introduction: Lipid-core nanocapsules are vesicular carriers constituted of an oily core surrounded by a polymeric wall[1,2]. The oily core is composed of an oil and a solid lipid association. The most widely used association is caprylic/capric triglycerides and sorbitan monostearate. However, changes in the composition of lipid-core nanocapsules can adjust their physicochemical characteristics in order to get a organization in molecular level of the system[1,2,3].
Objective: The aims of this study were to develop lipid-core nanocapsule suspensions containing different compositions of solids lipids and oils, and to study the influence of core composition in particles size.
Materials and Methods: Lipid-core nanocapsules were prepared by interfacial deposition of poli(ε-caprolactone) containing: solid lipids (cholesterol; sorbitan monostearate; stearic acid; cetyl palmitate) and oils (caprylic/capric triglycerides; oleic acid; mineral oil; octyl metoxicinamate). The distribution size was determined by light diffraction (Mastersizer®, Malvern, UK) considering the volume (%) of the particles and by photon correlation spectroscopy (PCS) using a Zetasizer®, (Malvern, UK). The physical stability was determined by multiple light scattering (Turbiscan Lab, Formulaction Co., France).
Results and Discussion: The light diffraction technique showed only nanoparticles with mean size from 0,199 µm to 0,608 µm for the associations of oleic acid with cholesterol, sorbitan monoestearte and cetyl palmitate, and caprylic/capric triglycerides; mineral oil; octyl metoxicinamate with sorbitan monoestearate. These formulations also presented physical stability by multiple light scattering technique. On the other hand, the other associations presented nanoparticles with micrometric particle population and mean size from 0,818 µm to 145 µm, as so any physical instabilities in the formulations. The photon correlation spectroscopy technique allows to observe the nanometric population of the formulations.
Conclusions: This work shows the importance of to use appropriate techniques in sequential analysis to choose the oil core composition in the lipid-core nanocapsules and to perform an accurate analysis of t size distribution and the physical stability of the formulations.

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