

PHYSICOCHEMICAL CHARACTERIZATION OF USNIC ACID-LOADED NANOCAPSULES

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This study reports the physicochemical characterization of the usnic acid-loaded nanocapsules (UA-NC) of PLGA. The structural analysis of nanocapsules was performed through infrared spectroscopy and thermogravimetry (TGA). Atomic force microscopy was used to examine morphologic characteristics of UA-NC. The mean size diameter and surface charge of UA-NC were determined by measuring the zeta potential (ξ). Nanocapsules presented spherical-shape with a smooth and rigid surface, and a mean size diameter of 214 ± 75 nm with a narrow polydispersity index (0.26). The surface charge of UA-NC was -28.4 ± 8 mV. The UA specific absorption bands are not observed in the nanocapsules infrared spectra, indicating that no drug-polymer interaction was detected. The TGA analysis revealed that the encapsulation of UA did not affect the thermotropic profile of the nanocapsules. The encapsulation of UA was able to prevent its thermal degradation at 250 °C. These results demonstrated that the UA encapsulation occurs with any interaction at molecular level with the polymer used to prepare nanoparticles.

Keywords: Usnic acid, nanocapsules, thermogravimetric analysis

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