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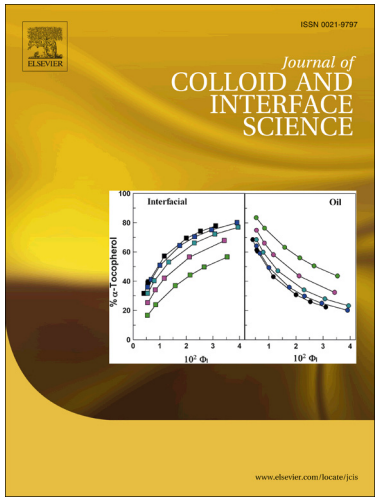

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Use of Alginate, Chitosan and Cellulose Nanocrystals as Emulsion Stabilizers in the Synthesis of Biodegradable Polymeric Nanoparticles

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Abstract

Biopolymeric nanoparticles (NPs) based on a biodegradable poly (DL-Lactide-co-Glycolide) PLGA copolymer matrix combined with alginate, chitosan and nanostructured cellulose crystals as three different natural emulsion stabilizers, were synthesized by a double emulsion (water/oil/water) method with subsequent solvent evaporation. The morphological, thermal, chemical and rheological properties of the novel designed NPs and the effect of the different emulsion stabilizers used during the synthesis were deeply investigated in order to optimize the synthesis procedure and the development of biodegradable nanoparticles based on natural polymers coated with natural polymers.

The morphological analysis of the produced nanoparticles showed that all the different formulations presented a spherical shape with smooth surface. Infrared investigations showed that the PLGA copolymer maintained its backbone structure and confirmed the presence of chitosan, alginate and cellulose nanocrystals (CNC) on the nanoparticles surface. The results