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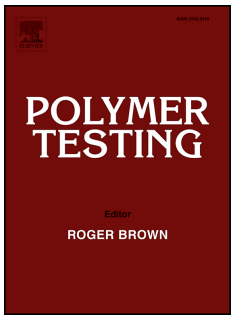

The preparation and characterization of composite materials by incorporating microspheres into a collagen/hydroxyethyl cellulose matrix

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The preparation and characterization of composite materials by incorporating microspheres into a collagen/hydroxyethyl cellulose matrix

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Abstract

Natural ingredients and innovative delivery systems are most widely used in the development and production of many skin care products in the fields of cosmetics and pharmacy. The main goal of this study was to design, prepare and characterize materials with microspheres incorporated into a porous polymer matrix. This study covered the preparation of 3D collagen/hydroxyethyl cellulose materials with incorporated gelatin or collagen-gelatin microspheres. The structures of the obtained materials were characterized using SEM and FTIR. Additionally, porosity, density, mechanical properties, swelling properties and resistance to degradation were measured. The obtained materials were loaded with pot marigold (*Calendula officinalis*) flower extract and the in vitro release was studied. The data indicated that the incorporation of gelatin and collagen-gelatin microspheres into polymeric matrices decreased their porosity and swelling properties, however, it increased their density and stiffness as well as their association with pot marigold flower extract. These materials may become the basis for a cosmetic or dermatological formulation.