

عنوان مقاله:

Experimental Design to Explore the Effective Parameters in Formulation of Dextran Microspheres via Emulsion Crosslinking Reaction

محل انتشار:

ششمین کنگره بین المللی مهندسی شیمی (سال: 1388)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

The present work describes adoption of a full factorial design-of-experiment methodology to explore the effective parameters on swelling behavior also mean particle size of microspheres prepared via an inverse emulsion technique using Span 80 as a non-ionic surfactant. Microspheres were prepared by chemical crosslinking of internal phase of the emulsion containing dextran using epichlorohydrin as an effective crosslinker for polysaccharides. Particle size and equilibrium swelling ratio of microspheres were selected as output responses upon their influential effects on final application of the produced microspheres as a hemostatic agent or drug carrier. The input parameters in the design were consisted of dextran concentration in the internal phase, molar ratio of the crosslinker to dextran, molar ratio of the reaction catalyst i.e. sodium hydroxide to the crosslinker and finally, surfactant concentration. Using this method; microspheres having uniform granularity with a smooth particle surface were obtained according to scanning electron micrographs. It was found that an increase in polymer concentration in aqueous phase and molar ratio of sodium hydroxide to the crosslinker leads to a significant decline and increase in the mean particle diameter of the microspheres. Moreover; water uptake capacities for microspheres were dependent on both dextran concentration in the aqueous phase and molar ratio of crosslinker/dextran ratios.

کلمات کلیدی:

Microspheres, Dextran, Crosslinking, Inverse Emulsion, Experimental Design

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