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Design of Nimesulide-Chitosan Microparticles by pH Change Coacervation

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***SUMMARY*. The present study involves the preparation of nimesulide-chitosan microparticles (NCM) as sustained delivery carriers with different polymer concentrations by pH change coacervation method using glutaraldehyde as cross-linking agent. Microparticle size was measured using light microscope. The drug release from NCM was tested by the rotating basket method of USP and the dissolution data were analyzed assuming various kinetic models. According to the results, the mean diameter and morphology of various batches of prepared NCM was 102 ± 1.95 μm to 152 ± 1.73 μm and yellowish rough spheres, respectively. Fourier trans-form infrared spectroscopy and differential scanning calorimetric analysis confirmed the compatibility of nimesulide with chitosan. X-ray diffractometry showed that there is a decrease in crystallinity of the drug after microencapsulation. All batches of NCM showed good flow properties. The rate of drug release decreased with increased concentration of chitosan. Formulation F5 was found to be an optimum formulation depending upon good encapsulation efficiency (65.87 ± 3.44 %) and smaller size (103 ± 3.37 μm). Maximum amount of drug release was 90.03 % in 12 h. The drug release data was analyzed by Korsmeyer-Peppas equation to calculate the diffusional exponent (n), which indicated diffusion pattern of nimesulide release. The stability studies of the NCM showed that drug was fully stable in microparticles at storage conditions of room temperature, 37 °C, 25 °C/60 % relative humidity (RH) and 45 °C/60 % RH, for 3 months using stability testing chamber. The present combination for encapsulating nimesulide demonstrates an effective way to prolong the drug release.**

KEY WORDS: Chitosan, Coacervation, *In vitro* evaluation, Microparticles, Nimesulide.

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