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Preparation and Physicochemical Characterization of CAP Microspheres Containing Ibuprofen

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Ibuprofen is an anti-inflammatory drug causing irritation on stomach mucosa upon per oral administration in the form of tablets or hard gelatin capsules. Preparation of cellulose acetate phthalate microspheres of ibuprofen with solvent evaporation technique was suggested to overcome gastric irritancy of the pure drug. At first, it was determine to conduct preformulation studies. FTIR analysis of pure drug (Ibuprofen), polymer (Cellulose acetate phthalate) and the micropsheres (empty and drug loaded) was investigated as part of preformulation studies. FTIR analysis obtained in this study revealed that there is no interaction between the polymer and the pure drug, indicating the appropriateness of the polymer of choice for preparation of enteric microspheres. The size of the microspheres were determined by sieving method using a vibrational universal sieving set. The mean diameters of the microspheres ranged from 250 μm to 500 μm. The reduction of stirring rate resulted in the formation of larger microspheres. It was found out that there is no positive correlation between the drug:polymer ratio and the mean diameter of the microspheres. SEM pictures of microspheres were taken for surface morphology evaluation. The mean loading capacity of the microspheres were found as 69.91 ± 1.2 % for microspheres with the diameter size of 500 μm. It was determined that the loading capacity is not dependent of stirring rate or drug: polymer ratio. Furthermore, the yield was calculated as a function of stirring rate and drug: polymer ratio. The stirring rate didn't influence the yield for those formulations containing 500 mg Ib. In contrast, the formulations contained 100 mg of Ib gave higher yield (76.57 ± 1.14%) with less stirring rate. In vitro release studies were carried out using USP paddle method at 37 ± 0.5°C (pH 7.4, 100 rpm). The release profile of Ib from microspheres were compared to that of plain drug. The kinetics of Ib release from the microspheres was also determined.

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