Abstract

The techniques used to prepare microcapsules have been refined and detailed over the last few years, sothat, the concept of the wide use of microcapsules has now become a reality, more recently, it has received an attention in various pharmaceutical purposes. Naproxen is non-steroidal anti-inflammatory drug, which has antipyretic and anti-inflammatory effects, the most its side effect are GI irritation locally and systemically, unpleasant taste, besides to its processing problems like bad flowability and light sensitivity.

Naproxen was prepared as microcapsules by complex coacervation using acacia-gelatin coacervate as coating material, aqueous colloidal polymer dispersion(ACPD) using ethyl cellulose and sodium alginate as coating polymers , gelation using only sodium alginate and solvent evaporation using ethyl cellulose only as coating polymer.

It was appeared that microcapsules prepared by 2:1 core to wall ratio is the best for all the preparation methods used for microencapsulation, giving an average encapsulation efficiency of 74 %, while complex coacervation method was the best for preparation of the microcapsules with 2:1 and 1:1 core to wall ratio, since it showed an average encapsulation efficiency of 78.5%.

The physical properties of the prepared microcapsules were determined for the free flow powdered, tabletted and encapsulated microcapsules.

It appeared that the release of drug from microcapsules was affected by core to wall ratio, pH of the medium, method of microencapsulation and the type of dosage form.

The results indicated that naproxen microcapsules flowability was improved and compared with that of the pure powder.

In comparison of prepared naproxen microcapsules, tablets and capsules to that of plain tablet of naproxen (Proxen®). The results indicated that the release of drug from tabletted and encapsulated microcapsules prepared by complex coacervation method was approximately the same to that of (Proxen®) tablet. In contrast to microcapsules prepared by ACPD method that showed a slower release.

In addition to that, the tabletted microcapsules prepared by complex coacervation showed a faster release rate than that of uncompressed microcapsules, the release became slowest as increasing the compression force and the hardness of tablets. Also tabletted microcapsules with 15% poly vinyl pyrrolidone have been shown retardness in drug release to about 8 hours compared with convential plain tablets (Proxen®).

On the other hand, the stability of the prepared microcapsules for 2:1 core to wall ratio prepared by complex coacervation and ACPD methods showed a shelf lives of 4.3 and 3.7 years for both methods respectively.

Moreover the microcapsules wall give a good protection of drug from light and other environmental conditions compared with a pure drug (4% weight loss).

An extensive period of aging (6 months) showed no change in the physical properties of microcapsules morphology and drug contents.

The overall results suggest that one can prepare naproxen capsules or tablets dosage forms through microencapsulation, with expected formula of prolonged drug release by incorporation of appropriate binder in certain concentration.