Preface

Multiparticulate drug delivery systems (MDDS) are especially suitable for achieving controlled or delayed release oral formulations with low risk of dose dumping, flexibility of blending to obtain different release patterns as well as reproducible and short gastric residence time. MDDS provide tremendous opportunities for designing new controlled and delayed release oral formulations. They have maximum absorption and minimized side effects. When taken orally, multiparticulates generally disperse freely in the gastro intestinal tract.

In the present study, an attempt was made to develop and evaluate sustained release pellets containing ketorolac tromethemine and aceclofenac, non-steroidal anti-inflammatory drugs with analgesic and anti-pyretic properties. Sustained release formulations can reduce the dosing frequency and increase patient compliance.

The main side effect of these drugs is the formation of ulcers. At the concentration of conventional drug delivery, there may be the chances for the formation of ulcers due to dose dumping. So, to overcome this disadvantage, modified release ketorolac tromethamine and aceclofenac formulations by using pelletization technique was chosen.

Developing a controlled releasing tablet matrix was difficult with the active ketorolac tromethamine because it is not compatible for the granulation with the
controlled release polymers. This is the reason for choosing pelletization technique which was the multiparticulate drug delivery. They are usually formulated in the form of suspensions, capsules or disintegrating tablets, showing a number of advantages over the single-unit dosage system. The pelletized product can freely disperse in G.I tract as a subunit, thus maximizing drug absorption and reducing peak plasma fluctuation. Consequently, potential side effects can be minimized without impairing drug bioavailability. Local irritation derived from high local concentrations of a drug from a single-unit dose, can be avoided. Thus the pelletized product can improve the safety and efficacy of the active agent.

The advantage of multi-unit products as a controlled-release dosage form is believed to be their behavior in \textit{in vivo} because of their advantageous dispersion pattern in the gastrointestinal tract and their special size characteristics. The transit time of a gastrointestinal drug delivery system along the gastrointestinal tract is the most limiting physiological factor in the development of a controlled-release gastrointestinal drug delivery system targeted to once-a-day medication. Gastro-intestinal transit time, greatly affects the bioavailability of a drug from an orally administered controlled release preparation.

The study involves the formulation of drug loaded pellets by solution layering over non-pareil seeds initially and then the functional coating over the drug layered pellets to sustain the release of drug using ethyl cellulose as a release retarding polymer. Various concentrations of polymers and plasticizers were used to prepare different formulations. The pellets were characterized for drug content, particle size distribution, flow properties, surface morphology and dissolution profile. \textit{In vitro} dissolution
studies were carried out using USP dissolution apparatus type I. The kinetic study of the
drug was performed and it was revealed that the release of drug from the optimized
formulation was appeared to follow first order kinetics. The dissolution profile and *in
vitro* release kinetics showed that the pellets were promising for sustained delivery of the
drug and have significant analgesic activity.