



## Alginate/Hydrophobic HPMC (60L) Particulate Systems: New Matrix for Controlled Release of Diclofenac Potassium

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**SUMMARY.** This work is focused on the development of a new particulate drug delivery system using sodium alginate (SA) and modified hydrophobic hydroxyl propyl methyl cellulose (HPMC, 60L grade) containing diclofenac as a model drug molecule for intestinal drug prolonged release. Diclofenac loaded HPMC-SA beads have been developed by ion exchange methods and were characterized by encapsulation efficiency, drug release profile, swelling and matrix erosion rate. Matrix swelling of calcium alginate beads induced by phosphate buffer ends up in erosion and destruction. However, for HPMC-SA beads do not lead to complete erosion, which may be the main cause of diclofenac retention within the matrix. The release of diclofenac potassium is negligible at acidic pH, while is complete in 5-6 h when pH is raised up to 7.4. The alginate/HPMC ratio controls the release rate of the drug. The drug release is decreased as the polymer concentration is increased from 2.5 to 3.5 %. Release kinetic study was done to understand the correlation between the formulations. The results show that drug release is diffusion controlled and it is Anomalous type which means combined process of both swelling and erosion of polymer.

**KEY WORDS:** Beads, Diclofenac, Hydrophobic HPMC, Sodium alginate, Swelling.

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