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Microwave assisted synthesis and evaluation of polyvinyl alcohol-co-2-acrylamide-2-methyl 1 propanesulfonic acid hydrogel for oral delivery of captopril

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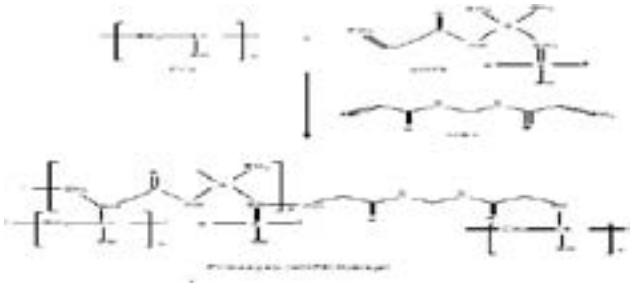
We report a highly swellable copolymeric hydrogel prepared by crosslinking poly- vinyl alcohol (PVA) with 2-acrylamido-2-methyl-1-propanesulfonic acid (AMPS) by microwave radiation using N, N'-methylenebisacrylamide (MBA) as crosslinker and very low quantities of potassium persulfate (KPS) as initiator. The prepared hydrogels were loaded with captopril and subjected to *in-vitro* and *in-vivo* evaluation. The swelling studies were performed at pH 2 and pH 7.4 to determine water absorption at lower and higher pH. The hydrogel formulations with higher proportions of AMPS and appropriate dose of radiation demonstrated maximum swelling. The prepared PVA-co-poly (AMPS) hydrogels were evaluated by FT-IR, SEM, XRD, and thermal analysis (DSC and TGA). The crosslinking in components was confirmed by FT-IR, XRD, TGA and DSC analysis. The *in-vitro* drug release was measured at wavelength of 205 nm using UV spectrophotometer. Drug release observed was higher at pH 2 than at pH 7.4, due to relatively more swelling capacity at lower pH in Aqueous medium. Pharmacokinetic parameters determined by oral administration to rabbits presented increased AUC, AUMC, MRT, t1/2(el), Vss and HVD for hydrogel formulations as compared to control. We can conclude that polyvinyl alcohol and AMPS polymeric network was developed successfully under the influence of microwave radiations as a controlled release drug delivery system for captopril.



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Biography

Furqan Muhammad Iqbal, is working as Assistant Professor of Pharmaceutics in Department of Pharmaceutics, Faculty of Pharmacy, Bahauddin Zakariya University, Multan. He started his carrier in product development and quality control in Pharmaceutical Industry (Pharmacia). Up till now, he has more than 10 year experience in teaching Industrial Pharmacy and conducting pharmaceutical research. He has his expertise in Pharmaceutical Technology regarding drug delivery systems, stimuli responsive polymeric drug carriers and their evaluation. Presently, he is working on Research projects on nanotechnology and drug targeting. He has a keen interest and passion in improving the health by minimizing the adverse effects of new as well as already existing therapeutic agents.

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