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Preparation and Characterization of PPy/PVA blend films

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The conductive polymer/hydrogel blends between polypyrrole (PPy) doped with 5-sulfosalicylic acid as model drug and poly (vinyl alcohol) (PVA) were developed as matrix/carriers of drug for the Electrically Controlled Drug Delivery System which is capable of releasing drug at various rates in response to electric field. The PVA films and their blend films were prepared by solution casting using glutaraldehyde as the crosslinking agent, and by mechanical blending of PPy particle within the PVA matrix, respectively. Drug release characteristic of films was studied using a modified Franz diffusion cell. The amount of released drug was analyzed by UV-Visible spectrophotometry. This study was conducted to determine the effects of crosslink ratio, drug concentration, blend composition, and electric field strength on drug release rate from the PVA films and their blend films on the diffusion coefficient. The degree of swelling of PVA films decreases as the crosslink ratio increases. The diffusion coefficient of drug in PVA films decreases with increasing crosslink ratio in absence of electric field. Moreover, the diffusion coefficient of drug in the PVA films depends critically on electric field strength between 0-5 V.

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