CHAPTER V
CONCLUSIONS

Drug release characteristics of CM-chitin/silk fibroin blend films crosslinked with glutaraldehyde were studied using theophylline, salicylic acid, diclofenac sodium and amoxicillin as model drugs. The pure CM-chitin film gave the maximum amounts of drug releases, corresponding to its maximum degree of swelling, for all model drugs. The amounts of drugs released from the blend films increased with increasing CM-chitin content. The releases of drugs from the films occurred due to the combined effect of swelling-controlled release and erosion process. The amount of drug released at pH 7.2 was higher than at pH 2.0 and pH 5.5 (pH 7.2 > pH 2.0 > pH 5.5) respectively. At pH 7.2, the carboxymethyl groups of CM-chitin ionized, leading to the dissociation of the adjacent chains. At pH 2.0, swelling stage of the films occurred due to the protonation of amino groups of CM-chitin. For all blend compositions and at all pH studied, the order of the model drugs from the lowest to the highest releases was as follows: amoxicillin< diclofenac sodium < theophylline <salicylic acid. Although there are several factors, including molecular weight of drug, drug-polymer interaction and solubility of drug in the blend solution, affecting the drug release from the films, in this study, it seems that molecular weight of model drugs was the main factor that had an influence on the amounts of model drugs released from the films. CM-chitin/silk fibroin blend films showed pH-sensitive character in their swelling behavior as well as drug release characteristic. By comparing drug release property of CM-chitin/silk fibroin blend films to that of CM-chitin/PVA blend films, CM-chitin was a dominant component that played an important role in swelling and drug release because it contains ionizable functional groups in its molecule.