# CHAPTER V
# CONCLUSIONS

The IN-loaded DCNR films and the IN-doped PCz/DCNR blend films were investigated for the release and permeation mechanism behavior and the diffusion coefficient of the drug under the effects of crosslink ratio and electric field strength. The crosslink density obtained by a swelling method showed a decrease of the density of rubber network with increasing crosslink ratio as a denser network reduced a solvent penetration and uptake. The diffusion coefficients of IN through the films were acquired by the force-fitted plots of the amounts of IN released versus time to the Higuchi's equation under the effect of crosslink ratio, electric field strength, and conductive polymer. The diffusion coefficients of the drug through the DCNR films decreased with increasing crosslink ratio resulting from the denser networks. For the effect of the electric field strength, the diffusion coefficient of the drug from the DCNR films was directly influenced by the strength of an applied electric field due to the electro repulsive interaction between the negatively charged drug and the negatively charged electrode. In addition, IN released from the PCz/DCNR blend films exhibited a higher diffusion coefficient than one from the DCNR films due to the reduction reaction of the conductive polymer which promoted a delivery of the drug through the membranes. Thus, the PCz/DCNR film is shown here as a potential candidate for the transdermal patch used under applied electric field.