

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Effect of Electric Field Strength on Diffusion of Ionic Drugs from Polyacrylamide Hydrogels ANUVAT SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, SUMONMAN NIAMLANG, The Petroleum and Petrochemical College — The apparent diffusion coefficients, D_{app} , and the release mechanisms of ionic-drugs from drug-loaded polyacrylamide hydrogels, drug-loaded PAAM, were investigated for the effects of various drug sizes (Lactic acid, 3.11 Å; Sulfanilamide, 3.47 Å; Ampicillin, 5.14 Å), matrix pore sizes, and electric field strengths. The D_{app} of the drugs from the drug-loaded PAAM increases with decreasing drug size, increasing matrix pore size or applied electric field strength. The increase in D_{app} can be attributed to the combination of the iontophoresis and the electroporation of the matrix pore. The D_{app} of drug from the drug-loaded PAAM apparently obey the scaling behavior: $D_{app}/D_0 = (\text{drug size}/\text{pore size})^m$ with the scaling exponent m equal to 0.73 and 0.50 at the electric fields of 0 and 0.1 V, respectively.

Anuvat Sirivat
The Petroleum and Petrochemical College, Chulalongkorn University

Date submitted: 09 Nov 2009

Electronic form version 1.4