

1084-35-237

Shibin Dai* (sdai@math.msu.edu), Department of Mathematics, Michigan State University, East Lansing, MI 48824, and **Keith Promislow**. *Functionalized Cahn-Hilliard equation: competitive evolution of bilayers and pores.*

The functionalized Cahn-Hilliard equation is introduced as a phase field model to describe the evolution of complex nanoscale structures similar to those observed in Polymer Electrolyte Membrane (PEM) fuel cells. Such complex structures include single layers, bilayers, pore networks and micelles, etc. We concentrate on the motion of closed bilayers and pores. Using asymptotic analysis, we analyze their inner structures and derive the leading order normal velocity in different time scales. Also we will show the mechanism under which they compete with each other. (Received September 03, 2012)