

1108-49-52

**Xiang Xu\*** (xu719@purdue.edu), 150 N University St, West Lafayette, IN 47907, and **David Kinderlehrer** and **Leonard Monsaingeon**. *A variational approach to Poisson-Nernst-Planck equations.*

The Poisson-Nernst-Planck system of equations used to model ionic transport is interpreted as a gradient flow for the Wasserstein distance and a free energy in the space of probability measures with finite second moment. A variational scheme is then set up and is the starting point of the construction of global weak solutions in a unified framework for the cases of both linear and nonlinear diffusion. The proof of the main results relies on the derivation of extra estimates based on the flow interchange techniques (Received December 16, 2014)