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**Modeling of Selectively Permeable Vesicle Membrane in Electrolytes: An Energetic Variational Formulation** CHUN LIU, ROLF RYHAM, Dept of Math, PSU — We introduce a self consistent coupled system to model the deformation of selectively permeable vesicle membranes in electrolytes via an energetic variational formulation. The equations governing a diffuse charge system and the evolution of the vesicle membrane are coupled with the momentum equations of the electrolyte through the Lorentz force along with the induced elastic forces due to the membrane bending energy. The force coupling and charge flux selectivity are consequences of the energetic balance and competition of kinetic, electric and membrane elastic bending energy. We will also present some numerical simulation results of the system.

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