

Abstract Submitted
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Law of mass action (LMA) with energetic variational approaches (EnVarA) with applications¹ CHUN LIU, Iliinois Institute of Technology, BOB EISENBERG, Rush University/Iliinois Institute of Technology, PEI LIU, University of Minnesota, YIWEI WANG, Iliinois Institute of Technology, TENGFEI ZHANG, China University of Geosciences — h *–abstract–*\pard In this talk, we will present a derivation to generalize the mass-action kinetics of chemical reactions using an energetic variational approach. Our general framework involves the energy dissipation law for a chemical reaction system, which carries all the information about the dynamics. The dynamics of the system is determined through the choice of the free energy, the dissipation (the entropy production), as well as the kinematics (conser- vation of species). The method enables us to capture the coupling and competition of various mechanisms, including mechanical effects such as diffusion, viscoelasticity in polymeric fluids and muscle contraction, as well as the thermal effects. We will also discuss several applications under this approach, in particular, the modeling of wormlike micellar solutions. This is joint work with Bob Eisenberg, Pei Liu, Yiwei Wang, and Tengfei Zhang.\pard-/abstract-\

¹Generalized law of mass action (LMA) with energetic variational approaches (En- VarA) with applications

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