1154-92-2471 **Dilruba A Sofia*** (dsofia@uamssd.edu), 1165 Pleasant St., Fall River, MA 02723, and **Nida Obatake** and **Anne Shiu**. *Classifying the Maximum Number of Steady States of Chemical Reaction Networks through Mixed Volume.* Preliminary report.

Many chemical processes can be modeled mathematically by chemical reaction networks. A chemical reaction network can give some ordinary differential equations that model the concentrations of the chemical species as time varies and conservation laws that constrain the total concentrations. Under mild hypotheses, this resulting system is a polynomial system. We can use this acquired system to solve for steady states of the network by setting the equations equal to zero and finding the values of the variables. For a generic polynomial system, the number of nonzero complex solutions is called the mixed volume. Since the concentrations of chemicals can only be described as positive real numbers, we are interested in the instances when the mixed volume equals to the maximum number of positive real solutions, because this would allow us to efficiently compute the maximum number of steady states of a network. We classify the monomolecular networks whose maximum number of steady states is equal to the mixed volume of the corresponding polynomial system. We also compute the maximum number of positive steady states and mixed volume for the genuine network with up to two reactions. (Received September 17, 2019)