292c Effect of Additives on the Nucleation Kinetics of Hen Egg White Lysozyme and Glucose Isomerase

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Information about nucleation kinetics, growth kinetics and solubility is necessary in predicting the solution conditions that result in crystals. As per classical nucleation theory, the energy barrier to nucleation raises exponentially as the crystallite-solution interfacial energy increases and vice versa. The quantitative effect of various additives on crystallite-solution interfacial energy, nucleation, and growth kinetics of proteins is not well-understood. In the present work equilibrium solubility of the proteins, hen egg white lysozyme and glucose isomerase, in presence of various additives including ethanol, acetonitrile, methyl pentane diol and glycerol were determined. Additionally, the number of crystals formed under various solution conditions was examined by optical microscopy and nucleation kinetics were also determined experimentally in the presence of some of the above additives. The analysis of the data will help in further understanding of the role of additives on protein crystal nucleation.