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Nucleation Dynamics of Particles with Directional Interactions[1]

TONI PEREZ, Physics Department, Lehigh University, Bethlehem, PA, AMIT CHAKRABARTI, Department of Physics, Kansas State University, Manhattan, Kansas, JAMES D. GUNTON, Physics Department, Lehigh University, Bethlehem, PA — Protein aggregation is a subject of many studies both experimentally and theoretically since many diseases are related to undesirable protein condensation. Proteins can be modeled as globular particles with highly directional interactions. A simple model that describes this kind of protein consist of patchy particles whose interactions depend on the orientation of the patches on the surface of each particle [1]. Recently the phase diagram of a six-patch model has been reported showing the existence of different ordered phases [2]. In this work, we discuss the dynamics of the nucleation and growth process of the six-patch model using Brownian dynamics simulations. In particular we study the kinetics of the process by which chains form and ultimately collapse to spherical droplets.

[1] N. Kern and D. Frenkel, J. Chem. Phys. 118, 9882 (2003)
[2] H. Liu, S. K. Kumar and J. F. Douglas, Phys. Rev. Let. 103, 018101 (2009)

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