Vapor density and temperature effects on nucleation

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Our goal of this project is to understand the process of cluster formation on a molecular level. We are interested in cluster formation because many global processes are the direct result of atmospheric nucleation. We use the concepts of classical nucleation theory to test the validity of our simulations. Starting with an ideal gas, such as argon, we hope to make accurate predictions of simulation parameters that result in cluster formation. We examined several factors in our simulations such as temperature, volume, and vapor density in order to determine what critical density is required for clusters to persist. After determining these trends for an ideal gas, we will explore the relationship of classical nucleation theory to a more realistic system of common molecules with stronger intermolecular forces and mixtures of molecules.