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The Nucleation Rate and the Gibbs Free Formation Energy of a Cluster H.R. KOBRAEI, Murray State University — In this work, we present an atomistic/molecular model along with the classical approximation for the Gibbs free formation of nuclei. The free formation energy of the critical cluster plays an essential role in the calculation of nucleation rates. Thus, we have constructed a nucleation rate relation which is easy to calculate and its result is relatively simple to compare with experimental data. The energy formation of a cluster has a few more terms than the traditional classical model. Furthermore, the extra terms in this approach have their roots in the molecular treatment of a cluster formation and they are temperature dependent. We have compared the result of this approach with the original classical theory along with some experimental data. Our initial results seem promising and the temperature correction has a correct trend.

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