

Mesoscopic nucleation theory for confined systems: a one-parameter model

M.A. Durán Olivencia; J.F. Lutsko

Abstract-

Classical nucleation theory has been recently reformulated based on fluctuating hydrodynamics [J. F. Lutsko and M. A. Durán-Olivencia, *Classical nucleation theory from a dynamical approach to nucleation*, *J. Chem. Phys.* **138**, 244908 (2013)]. The present work extends this effort to the case of nucleation in confined systems such as small pores and vesicles. The finite available mass imposes a maximal supercritical cluster size and prohibits nucleation altogether if the system is too small. We quantify the effect of system size on the nucleation rate. We also discuss the effect of relaxing the capillary-model assumption of zero interfacial width resulting in significant changes in the nucleation barrier and nucleation rate.

Index Terms-

Due to copyright restriction we cannot distribute this content on the web. However, clicking on the next link, authors will be able to distribute to you the full version of the paper:

[Request full paper to the authors](#)

If your institution has an electronic subscription to Physical Review E, you can download the paper from the journal website:

[Access to the Journal website](#)

Citation:

Durán-Olivencia, M.A.; Lutsko, J.F. "Mesoscopic nucleation theory for confined systems: a one-parameter model", Physical Review E, vol.91, no.2, pp.022402-1-022402-16, February, 2015.