Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

How a Nanodroplet Diffuses on Smooth Surfaces.[1] CHU LI, Department of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, JIZU HUANG, Institute of Computational Mathematics and Scientific/Engineering Computing, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, ZHIGANG LI, Department of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong — In this study, we investigate how nanodroplets diffuse on smooth surfaces through molecular dynamics (MD) simulations and theoretical analyses. The simulations results show that the surface diffusion of nanodroplet is different from that of single molecules and solid nanoparticles. The dependence of nanodroplet diffusion coefficient on temperature is surface wettability dependent, which undergoes a transition from linear to nonlinear as the surface wettability is weakened due to the coupling of temperature and surface energy. We also develop a simple relation for the diffusion coefficient by using the contact angle and contact radius of the droplet. It works well for different surface wettabilities and sized nanodroplets, as confirmed by MD simulations.

[1]This work was supported by the Research Grants Council of the Hong Kong Special Administrative Region under Grant No. 615312.

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Date submitted: 01 Aug 2016 Electronic form version 1.4