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Evidences of Homogenous Nucleation in Nano Confined Secondary Alcohol¹ SAMUEL AMANUEL, AMER KHRAISAT, JARGAL-SAIKHAN DULMAA, Department of Physics and Astronomy, Union College, Schenectady, NY 12308 — We have made comparative measurements to study the phase transition of physically confined 2-decanol in nano porous silica in the presences of excess bulk 2-decanol. We have systematically controlled the amount of excess bulk and studied how its existence influences freezing and melting temperatures. It appears that there is a lower limit in size, where freezing of the confined is not influenced by the presences or absence of the bulk. In our case this lower limit occurred with the average pore diameter of 100 nm. For 2-decanol confined in pore sizes larger than 100 nm, however, its freezing occurred at $T = -23^\circ\text{C}$, which was triggered by the freezing of the excess bulk. In absence of the bulk, freezing occurred at a lower temperature depending on size. Melting of the confined 2-decanol, on the other hand, was not influenced by the presences or absence of the bulk. Generally, the melting of the confined 2-decanol preceded the melting of the bulk. These suggest that the nucleation of 2-decanol confined to pore sizes less than 100 nm is homogenous and controlled by its extent of supercooling.

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