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Wetting dynamics of graphene matrix YANBIN WANG, SHAYANDEV SINHA, SIDDHARTHA DAS, LIANGBING HU, None — Wetting of atomistically-thin graphene layer(s) has attracted massive attention in the past few years due to several applications involving water-graphene interactions and the unique wetting translucency property of graphene. Holey-graphene has emerged as an important variant of nanostructured graphene that has found uses in many applications necessitating larger ion-accessible graphene surface area. Here we report our Molecular Dynamic (MD) simulation study of water-holey graphene wetting interactions. The holey graphene architecture is in form of a matrix of three layers in the vertical direction, and each of the layer consists of a porous three-layer graphene. Our simulations yield highly interesting water-holey-graphene wetting states that eventually leads to a significant enhancement of the water-accessible surface area. This is a paradigm shift in the context of holey graphene, which has so far been known to provide an increase in the ion-accessible surface area. We anticipate that our discovery will be a guiding force to large-scale manufacturing of graphene-based systems for applications involving graphene-water nexus.

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None

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