Abstract Submitted
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The role of SiO2/graphene interface on morphology of pentacene overlayer[1] GVIDO BRATINA, MANISHA CHHIKARA, University of Nova Gorica — We have examined by atomic force microscopy submonolayer of vacuum-evaporated pentacene on exfoliated graphene on SiO_2. Two-dimensional (2D) growth is observed on as-transferred graphene. When the samples were heated to 300°C for three hours, pentacene formed elongated, three-dimensional (3D) 20-nm-high islands. Strikingly similar pentacene morphology was observed on graphene that was transferred onto SiO_2, which was treated by hexamethyldisilazane (HMDS). We have also examined pentacene morphology on many-layer graphene (MLG) that was transferred onto untreated, and HMDS-treated SiO_2. In both cases we observed 2D growth. The observed differences in pentacene morphology can be attributed to the changes in graphene surface energy due to different interface layers. Interfacial water layer in the as-transfered graphene samples reduces the surface energy of graphene through the dipole field[1]. This results in 2D pentacene morphology. As the water layer is removed (via HMDS treatment or high-temperature annealing) the graphene surface energy favors 3D growth. As the graphene surface is moved away from the interface on MLG, the effect of the interface is reduced and pentacene grows as 2D layer. [1]J. Sabio, et al., Phys. Rev. B **77**, 195409 (2008).

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