

Insight into charge transfer and electronic properties in 'graphene/graphene quantum dot heterostructure

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Abstract

In recent years, graphene-based van der Waals (vdW) heterostructure have come into prominence showcasing interesting charge transfer dynamics which is significant for optoelectronic applications. These novel structures are highly tunable depending on several factors such as the combination of the 2D materials, number of layers, band alignment exhibiting interfacial charge transfer dynamics. Here we show an example of such a prototypical 0D-2D graphene/graphene quantum dot heterostructure exhibiting unusual charge transfer and enhancement of electron-phonon coupling leading to possible charge density wave like phase transitions.