Nucleation of Sm and Dy on graphene on Ir(111)

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Abstract

The fabrication of cluster arrays has drawn a lot of attention the last decades. Clusters, due to their reduced size, display unique properties unseen in the atomic scale or in the bulk state [1]. In nanotechnology, cluster arrays have become very popular because of their potential in the magnetic storage media, catalysis and bio-sensing applications. One way of fabricating cluster arrays with bottom-up approach is to deposit atoms from gas phase onto a template, where the particles diffuse and aggregate on specific sites, forming a periodic array. The graphene (Gr) moiré pattern [2], arising from the lattice mismatch between Gr and single crystal surfaces, represents one of the densest templates for this purpose. Here we use this template to grow cluster superlattices of rare earths. Our work is focused on the nucleation of Samarium (Sm) and Dysprosium (Dy) on Gr/Ir(111). For Sm we obtain ordered superlattices for deposition temperatures between 90 K and 110 K, while Dy clusters never form periodic arrays.

References

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