Change in graphene's work function on alkali halide deposition on Cu(111)

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Graphene exhibits remarkable electronic properties and is a promising material for electronic applications. (*1*) Common ways to obtain graphene are a top down preparation by exfoliation from graphite (*2*) or a bottom up synthesis on transition metal surfaces. The latter can be carried out by either carbon segregation or chemical vapour deposition (CVD). (*3*, *4*)

CVD allows for a controlled preparation of well-defined carbon films in ultra-high vacuum (UHV). (*5*) While the presence of a metal is essential for catalysis, the interaction of graphene with a metal substrate alters its electronic properties. (*6*) Thus graphene has to be transferred to an insulating surface to regain its unique properties. This can be done by means of wet etching. (*3*, *4*)

In-situ decoupling of graphene would promise a more clean and controllable approach towards graphene electronics. Like Graphite, Graphene on transition metals can be intercalated by metal atoms (*7*) and small molecules (*8*) which decouples graphene from the metal substrate.

To study the intercalation of insulating alkali halide thin films on graphene we prepared small graphene islands by chemical vapour deposition (CVD) of ethylene on Cu(111). (*5*) The islands properties were explored by scanning probe microscopy (SPM) techniques. On deposition of alkali halide thin films a change in the work function of graphene was found. This gave a first indication that graphene has been decoupled from the substrate.

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