

The interaction of atoms and molecules with graphene on metal substrates

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Two approaches to control graphene electronic properties and graphene-substrate interactions are chemical functionalization of graphene and intercalation at the graphene-metal interface. Both of these processes are highly dependent on the graphene-metal substrate interaction, edge effects and defects in the system, as well as the registry between the graphene and the metal lattices. In some cases Moire patterns lead to preferential intercalation and functionalization in some areas, leading to ordered nano-patterning, while in other cases disordered functionalization structures and uniform intercalation are observed.

In my talk I will present combined, scanning tunnelling microscopy, thermal desorption spectroscopy, angle resolved photoemission spectroscopy and density functional theory calculations on intercalation and functionalization of graphene on Ir(111)[1-4] and Pt(100) [5-8] substrates and discuss the mechanisms governing hydrogen functionalization of, as well as intercalation of gaseous species under graphene on transition metal substrates.

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