

Graphene interfaces: CVD growth on Ni, Y₂O₃-monolayer, and interface charge doping

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In this presentation I discuss CVD growth and interface properties of graphene [1] studied by electron spectroscopy (XPS, AES, UPS) and microscopy (LEEM, STM). The first part of my talk focuses on (monolayer) graphene growth on nickel surfaces in vacuum by chemical vapor deposition. We discuss the growth modes as a function of growth temperatures and competing carbon containing surface phases [2] and illustrate linear 1D-defects in graphene [3]. The second part discusses interfaces between metal/graphene/oxide sandwich structures. We demonstrate that yttria (Y₂O₃) forms a complete wetting layer on metal-supported graphene [4] and can form a crystalline well-ordered film on graphene [5]. Using x-ray photoemission spectroscopy (XPS) we demonstrate variation in charge doping of graphene depending on the combination of the metal and the oxide between the graphene-layer is sandwiched [6]. Finally, we show that the capability of XPS to measure charge doping in graphene may be useful tool to determine interface band alignment between graphene and arbitrary (semiconducting) substrates [7].

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[7] "Interface properties of CVD grown graphene transferred on to MoS₂(0001)" H. Coy-Diaz, R. Addou, M. Batzill submitted, "The interface between graphene and SrTiO₃(001) investigated by scanning tunneling microscopy and photoemission" H. Coy-Diaz, R. Addou, M. Batzill **J. Phys. Chem. C** DOI: 10.1021/jp4086156.