ATOMIC LAYERS OF PATTERNED GRAPHENE WITH BORON NITRIDE AND NITROGREN ENRICHED BORON NITRIDE

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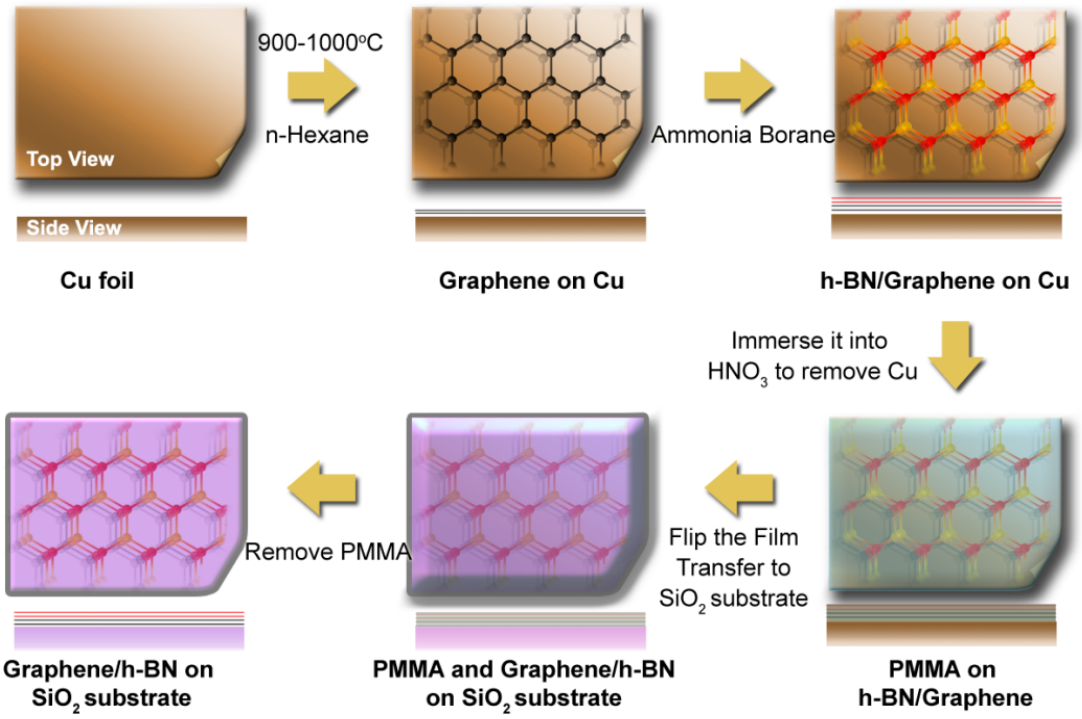
Hybrid graphene and boron nitride atomic layers have received a lot of research attention recently due the interesting electronic properties of graphene as well as the insulating properties of h-BN. Due to their similar 2-D honeycomb lattice structure as well as similar lattice parameter, boron nitride is a key candidate for use in future graphene based electronics. In order to build a 2-D nanostructured device, a few atomic layer graphene film on a copper substrate was patterned by e-beam lithography. The sample was then reacted with ammonia borane in a CVD chamber causing the exposed Cu regions to allow h-BN growth. The figure below shows a schematic of our process.



We have also grown h-BN films from ammonia borane with additional ammonia as a reactant to produce nitrogen enriched h-BN. Samples were analyzed with EELS, Raman spectroscopy, AFM, and TEM.