INVESTIGATION OF ELECTROCHEMICAL GATE CONTROLLED CHARGE TRANSPORT IN LARGE AREA BORON-NITROGEN DOPED GRAPHENE

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We report on the investigation of charge transport measurements of B and N doped graphene C (B,N) under the influence of an electrochemical gate. These C (B,N) systems are expected to have unique electronic properties due to the combination of impurities including both atomistically separated B and N species, as well as hexagonal boron nitride (*h*-BN) units within the graphitic C lattice. In the past, such measurements focused on micron scale graphene and were able to provide crucial information regarding electron mobility, quantum capacitance etc. In our investigations, we have used large area BN doped graphene in order to investigate the effect of topological disorders, grain boundaries and other substrate-related effects in electrochemical gate driven transport in such samples. Investigations were performed on devices fabricated with different BN doping levels. The electrochemically gate controlled interfacial capacitance and quantum capacitance of BN doped graphene devices were measured. The effect of doping on the quantum capacitance and electron mobility will be discussed.