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Understanding the effect of surface defects on sp2 carbon and HOPG ANDREW KOZBIAL, VAHID VAHDAT, HAITAO LIU, LEI LI, Univ of Pittsburgh, DEPARTMENT OF CHEMICAL & PETROLEUM ENGINEERING TEAM, DEPARTMENT OF CHEMISTRY TEAM — Basal planes of graphite are traditionally believed to be inert and electrochemical activity of graphitic materials was thought to occur at high energy defect sites, i.e., step edges. However, recent studies have shown the basal surface of graphite to be highly active and these results have significant implication on design of graphitic electrodes along with numerous other graphite, graphene, and carbon nanotube-based products. The mildly hydrophilic surface of fresh graphite subsequently adsorbs airborne contaminants causing the surface to transition towards hydrophobic behavior. A missing link between electrochemical activity and wettability requires elucidation of basal plane behavior and answering whether defect density on a graphite surface affects wettability. We have quantified defect density on various grades of highly ordered pyrolytic graphite (HOPG) through AFM imaging and contrasted wettability results to describe the effect of defect sites on wettability and surface contamination.

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