

Chemical Functionalization of Epitaxial Graphene by Azidotrimethylsilane

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Chemically modified epitaxial graphene (EG) by azidotrimethylsilane (ATS) was investigated using high resolution photoemission spectroscopy (HRPES). Through the spectral analysis, we clearly confirmed that EG is modified by thermally generated nitrene radicals and found that the bonding nature between the nitrene radicals and EG is covalent. As we observe bonding nature of N 1s peaks, we found that two distinct N peaks can be clearly distinguished in the spectra. Using a covalently bound stretched graphene (CSG) model, we elucidated that nitrene radicals adsorb on the interface layer of graphene at two different adsorption sites. Moreover, we were able to control the band gap of EG using valence band spectra as we change the amount of the dosing of nitrene.