

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Raman spectroscopic study of chemically-doped few layer graphenes PINGHENG TAN, WEIJIE ZHAO, JUN ZHANG, JIAN LIU — Graphene, the latest carbon allotrope discovered at 2004, has attracted intensively scientific interest owing to its distinctive properties. Chemical doping is expected to substantially increase the density of free charge carriers by charge transfer and to modify the Fermi level of doped materials. Here, we investigated charge transfer and optical phonon mixing in few layer graphenes in detail by utilizing sulfuric acid as an electron-acceptor dopant. Sulfuric acid molecules are found to be only physically adsorbed on the surface layers of graphenes and no intercalation happens. The top and bottom layers of bilayer graphenes can be intentionally doped differently by concentrated sulfuric acid. The difference of hole doping between the top and bottom layers results in phonon mixing of symmetric and antisymmetric modes in bilayer graphenes. The Raman frequency evolution with the doping level qualitatively agrees with recent ab initio theoretical calculations. Sulfuric acid molecules can be expected as a stable electron-acceptor dopant for graphenes to study the physical properties of few layer graphenes at different doping levels.

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Date submitted: 08 Nov 2010

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