

Stephan Hug, Bettina Lotsch:

Bottom-up Synthesis of Graphene

Since its discovery in 2004, graphene has attracted great interest because of its unique physical properties like the observation of room-temperature quantum Hall Effect, ultrahigh electron mobility, superior thermal conductivity, remarkable flexibility and having the title of the strongest material ever measured. Therefore graphene is a considered candidate to displace silicon as the basic material in the semiconductor industry by helping Moore's law to overcome the barrier of the silicon technology in the future.

However, there are several drawbacks in the synthesis of defect free graphene in large amounts because of its hydrophobic nature and high tendency to agglomerate in solvents.

Therefore our group (Prof. Bettina Lotsch, Ludwig-Maximilians-Universität Munich) is interested in developing novel bottom-up approaches for the synthesis of graphene, as well as exploring alternative chemical reduction methods of the graphene precursor graphite oxide.

The daily lab work will include basic inorganic synthesis combined with modern methods like spincoating and layer-by-layer assembly. The characterization of the materials will be provided by TEM, SEM, AFM, X-Ray, DLS, IR- and RAMAN spectroscopy.