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Graphene growth on insulator: Irradiating 10B pencil drawn paper and PLD in carbon oxides

After the discovery of graphene prepared by peeling graphite off using scotch tape, many methods are proposed and have used to prepare graphene film such as thermal decomposition of silicon carbide (SiC) and chemical vapor deposition (CVD) method. However, the CVD method requires metal catalyst (Cu, Ni) and films are required to transfer onto insulating substrates for device fabrications. Another interesting method employs pencils and paper. Paper sheet drawn using a lead pencil is irradiated by femtosecond laser and graphitic materials remain on the paper sheet. In this presentation, yet another method using pulsed laser deposition (PLD) in carbon oxide will be proposed. Carbon dioxide (CO₂) is product after hydrocarbon combustion in oxygen atmosphere. However, interestingly, CO₂ can be an oxidant in certain situations. We show direct growth of graphene on insulating substrates in 100% CO₂ environment and observed the layer by layer growth on stepped edge of insulating substrate. Oxidizing environment prepared by carbon oxides offers optimal environment for graphene growth and AFM images was indicative of layer by layer growth of graphene on insulating substrate. We will show details of AFM and Raman spectra at our presentation.

Biography

Satoru Kaneko has completed his BSc from Tokyo Metropolitan University; MS from University of Arizona and his PhD from Tokyo Institute of Technology. His study focuses on synthesis of functional materials of oxides, superconductor and graphite related materials and in fabrication of nano-structure. He has published more than 100 papers in reputed journals.

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