

INSD NanoScience Seminar (No.10)

Title: Simultaneous growth of monolayer graphene on nickel
and copper under ambient pressure CVD

Lecturer: Prof. Abdul Rahman Bin Mohamed (School of Chemical
Engineering, Engineering Campus, Universiti Sains Malaysia)

Date and Time: Tuesday, July 22th, 2014, 16:20-17:30

Place: Room 305 INSD Seminar Room, Interdisciplinary Research
Building 3rd floor, Toyonaka Campus

Abstract:

Graphene is a single layer of sp² bonded carbon atoms that are arranged into two dimensional honeycomb crystal lattice. The synthesis of graphene is now mainly focused on the single metal catalyst of CVD, where Ni and Cu are the main transition metals that have been widely studied. However both catalysts are having their shortcoming respectively. Monolayer graphene could only be grown under high vacuum condition or atmospheric pressure with methane in ppm scale on both catalysts. Bimetallic catalyst has recently become the trend of the research to inhibit the graphene formation on CVD predominately monolayer. There are 2 strategies to utilize bimetallic, either by using layer-by-layer bimetallic catalyst foil or by using alloy foil. But the separation of graphene from the catalyst is a tedious process. A new strategy has been developed by wrapping copper onto the nickel foil directly to realize the growth of monolayer graphene on both nickel and copper surfaces simultaneously under simple ambient pressure CVD. The separation of graphene from catalysts also becomes easier under this method. It is believed that the carbon that is dissolved into nickel transfers to the surface with the contact Ni and Cu. The small amount of carbon that diffuse through the nickel enhancing the formation of monolayer graphene on both Ni and Cu in the area where both are in contact.

Contact Person: Prof. T. Itoh, Institute for NanoScience Design,

E-mail: itoh@insd.osaka-u.ac.jp