

Graphene synthesis by chemical vapor deposition on Cu foil

Sung-Jin Kim¹, Kwonjae Yoo¹, E.K. Seo^{1,2}, Doowan Boo², and Chanyong Hwang¹

¹Center for Nano-Imaging Technology, Korea Research Institute of Standard and Science, 267 Gajeong-ro, Yuseong-gu, Daejeon 305-340, Rep. of Korea, ²Department of Chemistry, College of Science, Yonsei University, 134, Sinchon-dong, Seodaemun-gu, Seoul. 120-749, Rep. of Korea

Graphene has drawn great interests because of its distinctive band structure and physical properties[1]. A few of the practical applications envisioned for graphene include semiconductor applications, optoelectronics (solar cell, touch screens, liquid crystal displays), and graphene based batteries/super-capacitors [2-3]. Recent work has shown that excellent electronic properties are exhibited by large-scale ultrathin graphite films, grown by chemical vapor deposition on a polycrystalline metal and transferred to a device-compatible surface[4].

In this paper, we focussed our scope for the understanding the graphene growth at different conditions, which enables to control the growth towards the application aimed. The graphene was grown using chemical vapor deposition (CVD) with methane and hydrogen gas in vacuum furnace system. The grown graphene was characterized using a scanning electron microscope(SEM) and Raman spectroscopy. We changed the growth temperature from 900 to 1050°C with various gas flow rate and composition rate. The growth condition for larger domain will be discussed.

[1] A. K. Geim et al., Nat. Mater., 6, 183 (2007).

[2] Lin, Y.-M et al., Nano Lett., 9, 422 (2009).

[3] Wang, X et al., Nano Lett., 8 (1) 323 (2008).

[4] Li, X. S. et al., Science 324, 1312 (2009).