Growth Mechanism of Multi-Layer Graphene at Low-Temperature by Plasma Enhanced Chemical Vapor Deposition

Kayoung Yun[1], Dasol Cheang[1], Jiyeon Hyun[1], Aeran Roh[1], Sun Heo[1], Lanxia Cheng[2], Jiyoung Kim[2], Pil-Ryung Cha[1], Jagab Lee[1], Ho-Seok Nam[1,*]

[1]School of Advanced Materials Engineering, Kookmin University, Seoul, 136-702 Korea
[2]Department of Materials Science & Engineering, University of Texas at Dallas, Richardson, Texas, 75080 USA
kaysoars@kookmin.ac.kr
hsnam@kookmin.ac.kr

Abstract

Graphene has received a lot of attention in many applications due to its unique and outstanding properties. Especially, multi-layer graphene has been considered as a replacement of copper wiring on LSI (large-scale integration). Synthesis techniques for high-quality and large-scale graphene at low-temperature are required to apply for LSI semiconductor area. PECVD (plasma enhanced chemical vapor deposition) is one of the most expected methods for the industrial demands. Compared with thermal CVD graphene, the relatively lower quality of PECVD graphene is main drawback. In order to suggest a solution for the problem, we studied growth mechanism of multi-layer graphene on nickel by PECVD at 400℃. This study would be useful to optimize graphene growth conditions in many applications.