

Characterization of Low-Temperature Graphene Growth with Plasma Enhanced Chemical Vapor Deposition

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Graphene has drawn enormous attention owing to its outstanding properties, such as high charge mobility, excellent transparency and mechanical property. Synthesis of Graphene by chemical vapor deposition (CVD) is an attractive way to produce large-scale Graphene on various substrates. However the fatal limitation of CVD process is high temperature requirement(around 1,000°C), at which many substrates such as Al substrate cannot endure. Therefore, we propose plasma enhanced CVD (PECVD) and decrease the temperature to 400°C. Fig. 1 shows the typical structure of RF-PECVD instrument. The quality of Graphene is affected by several variables. Such as plasma power, distance between substrate and electronic coil, flow rate of source gas and growth time. In this study, we investigate the influence of these factors on Graphene synthesis in vacuum condition. And the results were checked by Raman spectra and conductivity measurement.

Keywords: Graphene, Plasma enhanced chemical vapor deposition, Low temperature process