

Graphene oxide green synthesis by atomic oxygen formed on Pt/Graphite

단탄중, 정진석[†]

울산대학교

(jschung@ulsan.ac.kr[†])

The chemical intercalation of graphite using strong and toxic oxidants to produce graphene oxide is the most popular method for mass graphite intercalation, including chemical and electrochemical oxidation approaches. However, the use of strong chemical oxidants is not only leading to a high degree of defects in graphitic structure in highly oxidized GO product, but also suffering from serious environmental pollution of toxic chemicals and the use of enormous amount of water for GO purification, highly risky explosion of reactions, and longtime reaction. Here, we report a green method, low degree of defects, safe, high efficiency, oxidized controlled level, and scalable to synthesize graphene oxide by atomic oxygen formed on Pt/Graphite in a two-phase gas-solid reaction. The forming of epoxy groups at low oxidation stage, and ethers and semiquinones, carboxyl groups form as oxidation proceeds have been studied.