

Chemical functionalization of graphene sheets by solvothermal reduction of a graphene oxide

Pham Viet Hung, Tran Viet Cuong, 허승현, 오은석, 김의정, 신은우, 정진석*
울산대학교
(jschung@ulsan.ac.kr*)

Graphene, a flat monolayer of carbon atoms packed into a two-dimensional honeycomb lattice, has attracted a great deal of scientific interest due to its excellent electronic, mechanical, thermal properties and high surface area. The chemical reduction of graphene oxide is considered a versatile method that is suited to the large-scale production and functionalization of chemically converted graphene (CCG). Among these reduction processes, solvothermal reduction is one of the most simple and effective method for reducing graphene oxide to CCG. We report effective method for reducing and functionalizing graphene oxide into CCG by solvothermal reduction of a graphene oxide suspension in N-methyl-2-pyrrolidone (NMP). High functionalized solvothermally reduced graphene oxide (STRG) shows superior dispersibility in various organic solvents, while slightly functionalized STRG shows excellent electrical conductivity. Free-standing STRG paper that was reduced for 1 h exhibited electrical conductivity as high as 21600 S m⁻¹, while the dispersibility of STRG that was reduced for 5 h was as high as 1.4 mg mL⁻¹.