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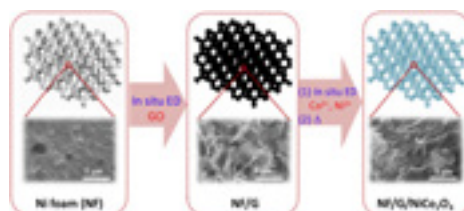
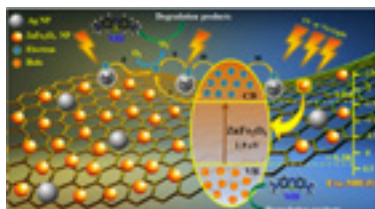


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Enhancement of electrochemical performance of super capacitors, sensors, and photo catalysts using graphene

Nanomaterials of metal oxides and conducting polymers have been developed for energy storage (supercapacitor), sensor, and photocatalyst applications. They have shown good electrochemical performances but are not satisfactory. Various materials such as graphene and carbon nanotubes have studied to enhance the electrochemical properties owing to their large surface area and high electrical conductivity. Synergistic effects of excellent conductivities of graphene and high electrical properties of metal oxides or polymers have improved the overall electrochemical performances tremendously. In this study, graphene (natural or synthesized), graphene oxide, reduced graphene oxide, highly reduced graphene oxide have been tested for improving performances as a super capacitor, sensor, and photocatalyst. Other methods have also been used such as doping of graphene with nitrogen or sulfur, using metal sulfides instead of metal oxides, and using highly porous materials as substrates. In the synthesis of these materials, a cleaner technology has been employed.



Biography

Jae-Jin Shim received his BS degree from Seoul National University in 1980, MS degree from KAIST in 1982, PhD degree from the University of Texas at Austin in 1990. He has been a Professor in Yeungnam University since 1994 and served as School Chairman and Vice-Dean of Engineering. He served as the President of the Korean Society of Clean Technology and Vice President of the Korean Society of Engineering Education. He is the Director of the Institute of Clean Technology and the Clean Energy Priority Research Center. He has published more than 140 papers in reputed journals and served as the Chief Editor of Clean Technology. His current research interests are synthesis and applications of graphene (or carbon nanotube) based nanomaterials for supercapacitors, catalysts, and sensors; syntheses of polymers and organic materials using supercritical fluids and ions.

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