

A glucose biosensor prepared with graphene based composites

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We synthesized graphene (GR) based composite such as TiO₂/GR and Pd/GR for glucose biosensor. The GR based composite was fabricated from a colloidal mixture of TiO₂ nanoparticles or aqueous solution of paladium chloride (PdCl₂) and graphene oxide (GO) sheets via an aerosol spray pyrolysis (ASP) that is a very fast and continuous process to fabricate the composites as one-step process without reduction reagents. The effect of the precursors content in the colloidal mixture on the composite property, including the morphology, crystal structure and specific surface area was investigated. The particle morphology of all TiO₂-GR composites was spherical in shape and micron-sized TiO₂ particles were encapsulated by GR nanosheets. The morphology of Pd/GR was the shape of a crumpled sheet of paper and the average size of the composite was around 1.3 μm in diameter. The amperometric responses of the glucose biosensors based on the composites were linear against a concentration of glucose ranging from 0 to 8 mM at -0.6 V. The fabricated glucose biosensor based on the Pd-GR composite showed high catalytic performance for glucose redox than the TiO₂-GR biosensor.

Biography

Hee Dong Jang is currently a distinguished researcher and a director of Rare Metals Research Center of Korea Institute of Geoscience and Mineral Resources. He received Ph.D. (1993) from Sogang University in Korea, and Ph.D. (2005) from Hiroshima University in Japan. He earned his postdoc at the University of California at Los Angeles (1996-1997) and visiting scholar at the Northwestern University (2009-2010) in US. He is currently a vice president of Korea Association for Aerosol and Particle Research (2010-present), and an Executive editor of Advanced Powder Technology (2009-present).

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