Optimizing Deposition of Platinum Nanoparticles on Functionalized Graphene Oxide

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In this research, we explored different parameters for depositing platinum nanoparticles on sulfonated graphene oxide (S-GO). Platinum nanoparticles (NPs) were formed in situ by reduction of a platinum precursor with sodium borohydride in presence of S-GO matrix. Prior to the deposition, GO was functionalized with sulphonic acid groups using a method developed in Professor Howard Fairbrother's research laboratory to improve the colloidal stability of GO in aqueous medium. The deposition process was optimized by varying the ratio of platinum precursor to S-GO (mass). The deposition was found to rely on the ratio of platinum cations to $NaBH_4$ (mole) as well as the reaction temperature and time. Chemical changes in GO due to reduction were followed with Fourier-transform Infrared Spectra (FT-IR) while elemental analysis was carried out by X-ray Photoelectron Spectroscopic technique (XPS) and size and shape of the platinum NPs was confirmed by analyzing Transmission Electron Microscopic (TEM) image.

Biography:

Nur U. Ahamad is a Professor of Chemistry at Shahjalal University of Science and Technology (SUST) in Bangladesh. He received his BSc and MSc in Chemistry from SUST where he started his career as a lecturer in 2004. He had been in Canada from 2006 to 2012 to complete his PhD from the Department of Chemistry at Carleton University in Ottawa. His PhD thesis focused on fabrication of 2D assemblies of metal nanostructures, with optimized size, shape and composition, as a platform for plasmonic sensors. After completion of his PhD he moved back to his home country to establish his own research lab. He received several research projects funded by national funding agencies like SUST-research center, UGC, Ministry of Education, Ministry of Science and Technology. As a potential young researcher, he was awarded a fellowship to attend the JSPS-HOPE Meeting with Nobel Laureates in 2016 in Japan. In the same year, he achieved Fulbright Visiting Scholar Grantto work in the Department of Chemistry at Johns Hopkins University, USA. There, he worked with Professor Howard D. Fairbrotheron fabricating environmentally benign fire-retardant textiles. His active field of research involve innovation of smart textile products, modification of nanocellulose for biomedical application and synthesis of inorganic nanostructures for environmental remediation and energy production. Dr. Ahamad is associated with several scientific organizations like American Chemical Society, Canadian Society for Chemistry, Bangladesh Chemical Society, JSPS-HOPE and Fulbright Associations. He is also a reviewer of the Journal of Plasmonics.