Preparation of graphene films decorated with Ag nanopaticles and its applications in photoelectrocatalysis

Shumin Chen
Jingchu University of Technology, China

In this report, a composite of graphene and Ag nanoparticles (Ag/G) were synthesized by sol-gel method in room temperature. A simple process was developed to synthesis compound of Ag/graphene by using the graphite powder as carbon source. Ag nanoparticles was supported on graphen by using in situ reduction and silver nitrate as Ag source. By control the degree of reduction, Ag/graphene composite modified with different ratios and properties were obtained. The morphology, configuration and compositions of this modified compound were characterized by the transmission electron microscope (TEM) and X-ray photoelectron spectroscopy (XPS), respectively. Its bonding forms and properties were obtained by Raman spectroscopy. It turns out that Ag nanoparticles were loaded on the graphene lamellas. Ultraviolet-visible spectrophotometry were used to analyzes their optical properties. The electrochemical characteristics of the composite were tested by the electrochemical workstation . Graphene decorated with Ag nanopaticles exhibits better performance of electrocatalytic character, especially aided by illumination. This work can further promote the development of graphene in application of photoelectrocatalysis.