

Microwave-assisted synthesis of silver nanoparticles/reduced graphene oxide composites

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Metal nanoparticles/graphene composites have attracted tremendous attention in recent years because of the remarkably unusual properties of metal nanoparticles combined with graphene. Among them, Ag nanoparticles/ graphene (AgNPs/GP) composites have been proved to be a most promising material because AgNPs-containing materials are good candidates for optics, electronics, catalysis, and electrochemistry. There are two methods to synthesize AgNPs/GP composites. One is to attach AgNPs onto GO sheets followed by the reduction of GO with reducing agent; the other is to reduce GO sheets first and then deposit or grow AgNPs on the reduced GO sheets. Both methods are time-consuming and require complex manipulation process. Recently, microwave irradiation techniques (MIT) have been demonstrated as a rapid and highly effective method for preparation of AgNPs/GN composites. However, most studies paid attention to use of extra reducing agent. There is no report on the effect of microwave controlled parameters such as time and power on the formation of AgNPs/GP composites. In this study, the effect of controlled parameters such as power and time on the formation of AgNPs/GP composites using microwave has been investigated.