

Zu, S.Z., and Han, B.H. (2009). Aqueous dispersion of graphene sheets stabilized by pluronic copolymers: formation of supramolecular hydrogel. *Journal of Physical Chemistry C*, 113: 13651–13657.

Abstract

In this study, a novel nanocomposite based on polyaniline/polyvinyl alcohol/Ag (PANI/PVA/Ag) has been successfully synthesized. The chemical reduction method was used to produce Ag nanoparticles colloidal solution from Ag⁺ ions. The polymerization of aniline was occurred in situ for preparation of polyaniline (PANI) in the presence of ammonium persulphate. With exposure to Ag nanoparticles on the PANI/PVA composite, a new nanocomposite was obtained. The morphology and particle size of the novel nanocomposite was studied by scanning electron microscopy (SEM), X-ray diffraction (XRD), and Fourier transform infrared (FT-IR) analyses. According to the XRD analysis, the size of nanoparticles was found to be in the range of 10-17 nm. The SEM images showed favored shape of nanoparticles as triangular particles which is benign shape for antibacterial analysis. The antibacterial activity of the obtained nanocomposite was also evaluated against bacteria of Gram positive *Staphylococcus aureus* (Staph. aureus) and Gram negative *Escherichia coli* (E. coli) using the paper disc diffusion method. The antibacterial study showed that the PANI/PVA composite did not have a very good antibacterial activity but PANI/PVA/Ag nanocomposites were found to be effective against two bacteria.

Keywords: Nanocomposite; Polyaniline; Polyvinyl alcohol; Ag nanoparticles; Antibacterial properties



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**Synthesis, characterization and antibacterial
properties of a novel nanocomposite based on
polyaniline/polyvinyl alcohol/Ag**

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