Synthesis of Ag@SnO_2 nanocomposite with enhanced photoelectrochemical behaviour

Sajid Ali Ansari, Mohammad Mansoob Khan,
Mohd Omaish Ansari, 조무환*
Yeungnam University
(mhcho@ynu.ac.kr*)

The Ag@SnO2 nanocomposite was successfully synthesized in water using an electrochemically active biofilm. The resulting nanocomposite was characterized by diffuse reflectance spectroscopy, X-ray diffraction, transmission electron microscopy, photoluminescence spectroscopy and X-ray photoelectron spectroscopy. Photoelectrochemical measurements such as electrochemical impedance spectroscopy, linear scan voltammetry and differential pulse voltammetry in the dark and under visible light irradiation revealed a significant increase in the visible light response of the Ag@SnO2 nanocomposite compared to the p-SnO2 nanostructures. Based on these results, we concluded that the anchoring of Ag on the SnO2 surface efficiently enlarges the absorption range and improves photogenerated electron separation, thereby improving the photoelectrochemical performance. The strategy presented in this work may be applied to design other noble metal decorated metal oxide nanostructures for the visible light applications.