

Ag-doped Indium Sulfide Nanoparticles for photocatalytic Applications

알하마디 살레, 문보경, Abdelrahman M. Rabie, Mostafa Sayed, 심재진, 김우경<sup>†</sup>  
영남대학교  
(wkim@yu.ac.kr<sup>†</sup>)

The effect of Silver (Ag) doping on  $\text{In}_2\text{S}_3$  NPs characteristics and on the related photocatalytic properties has been studied. In this work, pure  $\text{In}_2\text{S}_3$  and Ag-doped  $\text{In}_2\text{S}_3$  NPs were synthesized through cost-effective chemical precipitation process. All the prepared  $\text{In}_2\text{S}_3$  NPs were analyzed using several analysis techniques. The XRD results indicates that's all the prepared  $\text{In}_2\text{S}_3$  NPs with different doping concentration (0.0, 0.7, 1.2 and 2.6%) have a polycrystalline cubic crystal. Therefore, The XRD results indicates Ag doping didn't affect the  $\text{In}_2\text{S}_3$  crystal structure. The chemical bonding states and composition of the prepared  $\text{In}_2\text{S}_3$  NPs were confirmed from XPS results, which the results showed all the samples has identical composition of  $\text{In}_2\text{S}_3$  NPs. The SEM results showed the prepared  $\text{In}_2\text{S}_3$  NPs has a spherical shape. The doping with Ag enhanced the photocatalytic characteristics of  $\text{In}_2\text{S}_3$  NPs for the photodegradation of different organic pollutants and on the hydrogen production via photoelectrochemical water splitting process under visible light.