

AgGaS₂-type Photocatalysts for Hydrogen Production under Visible Light : Effects of Postsynthetic H₂S Treatment

장점석, 최선희¹, 신남수¹, 이재성*
포항공과대학교 화학공학과; ¹포항가속기
(jlee@postech.ac.kr*)

Bulky AgGaS₂ was synthesized as a p-type semiconductor photocatalyst by a conventional solid state reaction under N₂ flow for hydrogen production under visible light. To remove the impurity phase involved in the synthesized material and improve its crystallinity, the material was treated at various temperatures of 873–1123 K under H₂S flow. Impurity phases were identified as β-Ga₂O₃ and Ag₉GaS₆ with the cell refinements of XRD and the local coordination structure around gallium atom in AgGaS₂ was investigated by EXAFS. As the H₂S-treatment temperature increased, the contribution from impurity phase was diminished. When the temperature reached 1123 K, the impurity phases were completely removed and the material showed the highest photocatalytic activity.