

Preparation of $\text{Ag}_3(\text{PO}_4)_x(\text{VO}_4)_{1-x}$ photocatalyst and its Photocatalytic Performance

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$\text{Ag}_3(\text{PO}_4)_x(\text{VO}_4)_{1-x}$ was prepared by precipitation method and evaluated for the decomposition of Orange II dye under visible light irradiation ($\lambda > 530\text{nm}$). UV-vis DRS showed that $\text{Ag}_3(\text{PO}_4)_x(\text{VO}_4)_{1-x}$ had similar visible light absorptivity to Ag_3VO_4 . X-ray diffraction indicated that $\text{Ag}_3(\text{PO}_4)_x(\text{VO}_4)_{1-x}$ was a single-phase compound. XRD pattern of $\text{Ag}_3(\text{PO}_4)_x(\text{VO}_4)_{1-x}$ was very similar to the XRD pattern of Ag_3VO_4 . It was due to Ag_3VO_4 was more stable than Ag_3PO_4 . Moreover, right shifted XRD pattern means that relatively small PO_4^{3-} ions penetrated into Ag_3VO_4 lattice. The photo activities of the synthesized samples were evaluated by photocatalytic decomposition of the Orange II dye. $\text{Ag}_3(\text{PO}_4)_x(\text{VO}_4)_{1-x}$ had better photocatalytic activity than Ag_3PO_4 and Ag_3VO_4 under $\lambda > 530\text{nm}$ irradiation, where Ag_3PO_4 rarely absorbed the light.