

## Surface modification of Ag<sub>3</sub>PO<sub>4</sub> using the alginate for highly active photocatalyst under visible light irradiation

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<b>First Author</b>	
<b>Last Author</b>	
<b>Authors</b>	Sulaeman, U; Gandasasmita, YK; Diastuti, H; Iswanto, P; Isnaeni, I; Taufik, A; Yin, S;
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<b>Abstract</b>	Surface modification of Ag <sub>3</sub> PO <sub>4</sub> using alginate has been successfully synthesized. Ag <sub>3</sub> PO <sub>4</sub> was prepared by precipitation method using CaHPO <sub>4</sub> /hydroxyapatite composite as a source of phosphate ion and AgNO <sub>3</sub> ethanol solution. Alginate was introduced on the surface of Ag <sub>3</sub> PO <sub>4</sub> under the chemisorption method. Products were analyzed using XRD, DRS, PL spectra, FTIR, SEM, TEM, and XPS. A small band edge absorption at 729 nm was created after surface modification using alginate. XPS analysis showed that the binding energy shifts of 0.3 eV and 0.5 eV were observed after alginate treatment for Ag3d and P2p respectively indicating that the alginate was successfully chemically bound to the Ag <sub>3</sub> PO <sub>4</sub> surface. The alginate-modified Ag <sub>3</sub> PO <sub>4</sub> photocatalyst showed much higher photocatalytic activity than pure Ag <sub>3</sub> PO <sub>4</sub> . The high activity is caused by the formation of conjugates that can act as electron donors under visible light irradiation.
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<b>Author</b>	UYI SULAEMAN, S.Si, M.Si, PhD