The use of metal phosphates as photocatalyst for environmental application

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Semiconductor photocatalysts for environmental applications have attracted considerable attention due to their ability to photodegrade pollutants. Among the most promising and emerging classes of semiconductor, metal phosphates offer the potential to combine several metal cations and phosphate anions, resulting in a variety of potentially photoactive semiconductors. [1]

One particularly interesting material is silver phosphate, which has a narrow bandgap that enables visible light absorption. Ag_3PO_4 exhibits exceptional photoactivity for oxygen evolution in water splitting and degradation of pollutants in aqueous solutions. However, photocorrosion limits its practical applications. Designing Ag_3PO_4-based photocatalysts with optimized bandgap, surface properties and stability is therefore of great importance. After silver phosphate, the most prominent semiconductor is bismuth phosphate, displaying better photocatalytic activity than P25 in the UV region in some cases. Several approaches to enhancing the adsorption ability and visible light response have already been reported.

Herein, we present our research into photocatalytic behavior of composite based on bismuth and silver phosphate, coated on different supports such as clays, activated carbon and magnetite. [2-4] Results indicate that Ag_3PO_4 composite materials present higher activity and improved stability. Coating $BiPO_4$ on clay surface enhances adsorption and photocatalytic activity for the oxidation of diclofenac under LED, UV, and solar light irradiation.

These investigations reveal promising finding for the future use of these materials in real word application.

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