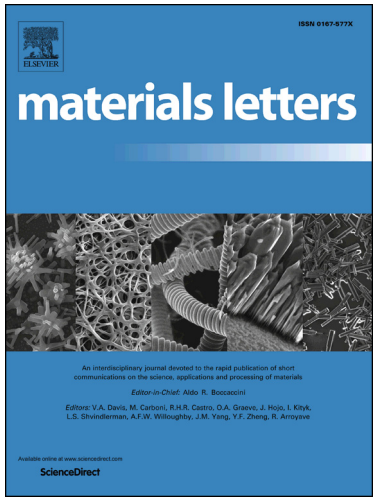

Novel Magnetically Separable Ag_3PO_4@$CuFe_2O_4$ Micro-nanocomposite with Highly Enhanced Visible-light-driven Photocatalytic Activity

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Novel Magnetically Separable Ag_3PO_4@$CuFe_2O_4$ Micro-nanocomposite with Highly Enhanced Visible-light-driven Photocatalytic Activity

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Abstract: An effective visible-light-driven Ag_3PO_4@$CuFe_2O_4$ Z-scheme magnetic micro-nanocomposite was successfully fabricated by a simple ion-exchange deposition method. The Ag_3PO_4@$CuFe_2O_4$ photocatalyst exhibited remarkably enhanced photocatalytic activity (degradation efficiency was ~99% within 30 min and kinetic constant reached 0.1423 min^{-1}) as compared to Ag_3PO_4 and $CuFe_2O_4$ for the degradation of Rhodamine B (RhB). Comparing the activity results dependence with the characterization results, it was indicated that the dependence of the photocatalytic activity on the efficient separation of photogenerated h^+-e^- pairs. This study might provide a promising visible light responsive photocatalyst for the photocatalytic degradation of organic dyes in waste water.

Keywords: Composite materials, Magnetic materials, Z-scheme, Visible photocatalytic, highly effective

1. Introduction

In recent decades, environmental pollution due to the rapid industrial expansion and human population growth is one of the most important challenges facing all leaving beings worldwide[1]. Hence, developing effective, environmental-friendly, and low-cost technology for water treatment is one of the key issues[2]. Among various strategies, photocatalytic degradation has attracted much attention as a

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