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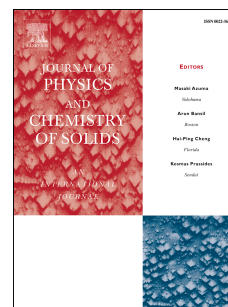
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One-pot hydrothermal synthesis of CuCo₂S₄/RGO nanocomposites for visible-light photocatalytic applications

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Abstract

CuCo₂S₄/reduced graphene oxide (RGO) nanocomposites with varying amount of RGO loadings were synthesized using a simple hydrothermal method. L-Cysteine has been used as a bio-sulfur source to synthesize CuCo₂S₄ nanoparticles. Scanning electron microscopy (SEM) and high resolution transmission electron microscopy (HRTEM) images showed that the CuCo₂S₄ nanoparticles uniformly decorated the entire surface of the RGO sheets. The results of photo electrochemical studies revealed that the incorporation of RGO could improve the effective electron transportation, which leads to higher photocatalytic activity. The highest degradation efficiency toward photodegradation of malachite green was achieved with 3% of RGO loading in the CuCo₂S₄ matrix. Furthermore, based on experimental results, the underlying mechanism for photocatalysis was proposed and discussed. This study demonstrates that the CuCo₂S₄/(RGO) nanocomposites could be used as a green photocatalyst for environmental applications.

Keywords: CuCo₂S₄, L-Cysteine, Graphene oxide, Hydrothermal synthesis, Photocatalyst

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