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The design of novel visible light driven Ag/CdO as smart nanocomposite for photodegradation of different dye contaminants(Article)

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Abstract

In this paper, we report a novel visible light driven Ag/CdO photocatalyst, fabricated for the first time via one pot hydrothermal method and further applied for the photodegradation of two important exemplar water contaminants, Malachite green and Acid Orange 7. The microstructure, composition and optical properties of Ag/CdO nanocomposites were thoroughly investigated by various techniques. Scanning electron microscopy clearly shows that Ag NPs were strongly embedded between the CdO nanoparticles. Among the series of synthesized Ag/CdO nanocomposites, (5%) Ag/CdO nanocomposite possesses enhanced photocatalytic activity. This result was attributed to the synergistic effect between Ag and CdO, and mainly Ag NPs can act as an electron trap site, which could reduce the recombination of the electron-hole and induce the visible light absorption. The active species trapping experiments implicate $^{[rad]}OH$ and $O_2^{[rad]-}$ radicals as the respective primary and secondary reactive species responsible for oxidative photodegradation of organic pollutants. On the basis of the results, a possible photocatalytic mechanism has also been proposed. © 2017

Author keywords

Ag/CdO | Hydrothermal method | Malachite green | Visible light photocatalyst

Indexed keywords

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