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Enhancement of the photocatalytic activity of europium(III) oxide by the deposition of gold for the removal of atrazine

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Abstract

Europium(III) oxide nanoparticles were prepared using a hydrothermal method. Gold was deposited by a photo-assisted deposition method. Europium(III) oxide and gold deposited europium(III) oxide were characterized using different techniques. The results demonstrated that gold was present as a metallic gold, and it was well-dispersed on the europium(III) oxide surface. The photocatalytic activity of europium(III) oxide and gold deposited europium(III) oxide was measured by the degradation of atrazine using visible light irradiation. The photocatalytic activity of gold deposited europium(III) oxide is higher than that of europium(III) oxide. This finding can be attributed to the synergic effect between europium(III) oxide and gold. Moreover, the results revealed that an increase in the weight percent of gold increases the photocatalytic activity of europium(III) oxide, and the most active photocatalyst is 0.20 wt % gold deposited europium(III) oxide. The photocatalyst of 0.20 wt % gold deposited europium(III) oxide has high photocatalytic stability and can be reused five times without a decrease in photocatalytic activity. (C) 2016 Elsevier B.V. All rights reserved.

Keywords

Author Keywords: Degradation of atrazine; Europium(III) oxide; Gold deposition; Visible photocatalyst**KeyWords Plus:** PHOTO-ASSISTED DEPOSITION; INDIGO CARMINE DYE; ACTIVATED CARBON; CATALYTIC-PROPERTIES; IMPREGNATION METHODS; METAL CATALYST; DEGRADATION; AMITROLE; TIO2; PHENOL

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