

عنوان مقاله:

Photocatalytic Degradation of Methylene Blue Dye from Waste Water by magnetic g-C₃N₄/CoFe₂O₄ Nanocomposite

محل انتشار:

دومین کنفرانس بین المللی کاربرد مواد و ساخت پیشرفته در صنایع (سال: 1401)

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نویسندگان:

Arsalan Ajami - MSc student, School of Metallurgy and Materials Engineering, College of Engineering, University of
;Tehran, Tehran, Iran

Saeed Sheibani - Associate Professor, School of Metallurgy and Materials Engineering, College of Engineering,
;University of Tehran, Tehran, Iran

Abolghasem Ataie - Professor, School of Metallurgy and Materials Engineering, College of Engineering, University of
;Tehran, Tehran, Iran

خلاصه مقاله:

A magnetic photocatalytic g-C₃N₄/CoFe₂O₄ nanocomposite was synthesized via a simple co-precipitation method for waste-water purification. X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM) and UV-vis diffuse reflection spectroscopy (DRS) were employed to characterize the synthesized photocatalytic nanocomposite. The results showed that CoFe₂O₄ (CF) nanoparticles with an average particle size of ۴۰ nm precipitated on the surface of g-C₃N₄ (g-CN) nanosheets and there has been a strong bonding between them. The photocatalytic performance of g-C₃N₄/CoFe₂O₄ nanocomposite was evaluated by degradation of methylene blue (MB) in an aqueous solution under visible light irradiation. It was found that the g-C₃N₄/CoFe₂O₄ nanocomposite has more efficiency in the degradation of MB than using individual g-CN or CF phases. The degradation of MB increased from ۵۸% in g-CN sample to ۶۴% in nanocomposite one. This enhancement could be attributed to the synergistic effect between CF and g-CN. In nanocomposite, sample band gap energy of the photocatalyst decreases (۱.۶۷ eV) and charge carrier production and separation takes place more efficiently. Thus, adsorption and degradation of pollutants on the surface of the photocatalyst occurs at a higher rate. After the photocatalytic reaction, C₃N₄/CoFe₂O₄ nanocomposite sample can be quickly separated from the water by an extra magnetic field due to its strong magnetic nature.

کلمات کلیدی:

Photocatalyst, g-C₃N₄, CoFe₂O₄, Nanocomposite; Dye degradation

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