

عنوان مقاله:

Synthesis of the novel zeolite NaY/CuFe₂O₄/CdS Ternary nanocomposite for the sonocatalytic degradation of Toxic organophosphorus pesticide from water media

محل انتشار:

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خلاصه مقاله:

In this research, the zeolite NaY/CuFe₂O₄/CdS ternary nanocomposite as a novel magnetically separable catalyst was successfully synthesized by means of the ultrasonic-assisted solvothermal strategy. The structural, morphological and optical features of the nanocomposite were analyzed by using FESEM, EDAX, FTIR, XRD and VSM. The sonocatalytic activity of zeolite NaY/CuFe₂O₄/CdS was evaluated in the degradation of the toxic organophosphorus pesticide, namely chlorpyrifos (CP, O,O-Diethyl O-۳,۵,۶-trichloropyridin-۲-yl phosphorothioate) from water media. Several analytical parameters such as irradiation time, initial CP concentration, process type, catalyst dosage, and initial H₂O₂ concentration were investigated to achieve the maximum sonocatalytic performance. Regarding the obtained data, the NaY/CuFe₂O₄/CdS sonocatalyst was incredibly able to completely degrade the CP pesticide using the ultrasonic (US)/H₂O₂ system. The [•]OH free radicals were also recognized as the main reactive oxygen species on the sonodegradation reaction of CP under irradiation. Moreover, the recyclability of the NaY/CuFe₂O₄/CdS zeolite sonocatalyst was implemented, which clearly confirmed that it can be recycled up to sequential four times with almost .trivial loss of sonocatalytic performance

کلمات کلیدی:

NaY/CuFe₂O₄/CdS, zeolite, nanocomposite, chlorpyrifos, degradation, Us irradiation, H₂O₂

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