

عنوان مقاله:

Ultrasound-assisted degradation of rhodamine B(RhB) organic dye onmagnetic ZnFe₂O₄-ZnS-ZSM-5 nanocomposite catalyst from water media

محل انتشار:

یازدهمین کنفرانس بین المللی راهکارهای نوین در مهندسی، علوم اطلاعات و فناوری در قرن پیش رو (سال: 1400)

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خلاصه مقاله:

Magnetic ZnFe₂O₄-ZnS-ZSM-5 zeolite nanocomposite was successfully fabricated using hydrothermal route. The gained nanocomposite was identified via Field emission scanning electron microscopy, energy-dispersive X-ray spectroscopy, X-ray diffraction, Fourier-transform infrared spectroscopy, magnetic measurements, and Brunauer-Emmette-Teller. The outcomes affirmed the production of ZnFe₂O₄-ZnS-ZSM-5 nanocomposite with the average crystallite size of ۱۴ nm. The aforementioned nanocomposite was utilized as a newly sonocatalyst for the degradation of rhodamine B (RhB) organic dye under ultrasound irradiation. The data revealed complete degradation of RhB (۲۵ mg/L) within ۱۲ min in the presence of ZnFe₂O₄-ZnS-ZSM-5 nanocomposite and H₂O₂ (۴ mM). The trapping experiments demonstrated that •OH free radicals are the main active species in the degradation of RhB. Furthermore, sonocatalytic performance of the ZnFe₂O₄-ZnS-ZSM-5 nanocomposite was higher than those of raw ZnFe₂O₄ and ZnS, illustrating that the combining ZnS with magnetic ZnFe₂O₄ could be a suitable choice to enhance its sonocatalytic performance. The nanocomposite could be magnetically separated and recycles without any observable .change in its structure and activity even after four sequential cycles

کلمات کلیدی:

ZnFe₂O₄-ZnS-ZSM-5, Zeolite, Nanocomposite, rhodamine B (RhB), Degradation

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