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Fabrication of Novel $ZnSeO_3$ Anchored on g-C_3N_4 Nanosheets: An Outstanding Photocatalyst for the Mitigation of Pesticides and Pharmaceuticals(Article)

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Abstract

In the scope, the developed novel $ZnSeO_3$/g-C_3N_4 nanocomposites and characterized in detail. Interestingly, the as prepared nanocomposites examined for the detoxification of organic pollutants like methyl parathion (MP) and cefuroxime drug (CF) under Visible light irradiation. The synthesized $ZnSeO_3$/g-C_3N_4 nanocomposites were characterized by various techniques such as X-ray diffraction (XRD), fourier transform infra-red (FTIR), UV–Vis diffuse reflectance spectra (DRS/UV–Vis), scanning electron microscopy (SEM), transmission electron microscopy (TEM), and energy dispersive X-ray spectra (EDX). The photocatalytic studies carried out by UV–Visible Spectroscopy it was exhibited that $ZnSeO_3$/g-C_3N_4 nanocomposites photocatalyst was a superior photocatalytic performance with the degradation efficiency of an analytic solution of MP and CF observed about 120 mins and 80 mins. The reactive oxidative species are ·OH radical and superoxide radical $O_2^{\bullet-}$ involved in the photocatalytic reaction under the source of visible light irradiation by trapping experiments. After the completion of degradation process, the photocatalyst was reused by centrifugation method. The reusability of photocatalyst was highly stable up to eighth cycle. Graphical Abstract: [Figure not available: see fulltext.]

Author keywords

Antibiotics | g-C_3N_4 | Pesticides | Photodegradation | $ZnSeO_3$

Indexed keywords

Engineering controlled terms: Degradation | Detoxification | Fourier transform infrared spectroscopy | Free radicals | High resolution transmission electron microscopy | Irradiation | Light | Nanocomposites | Organic pollutants | Photocatalytic activity | Reusability | Scanning electron microscopy | Zinc compounds

Engineering uncontrolled terms: Degradation efficiency | Diffuse reflectance spectrum | Energy dispersive x-ray | Fourier transform infra reds | Photocatalytic performance | Photocatalytic reactions | Reactive oxidative species | Visible-light irradiation

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