

عنوان مقاله:

A Survey upon the Usage of Photocatalytic AsFeO₃ Nanofibrous Mats for Establishing an effective Water Treatment

محل انتشار:

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خلاصه مقاله:

The presence of hazardous nondegradable contaminants in water such as pharmaceuticals and organic and inorganic solutes poses dangers of human and environmental exposure that result in health effects and environmental damage . A widespread need, therefore, exists for developing cost effective and scalable methods to reduce harmful compounds to a permitted amount or eliminate them entirely. Many methods such as the application of polymeric adsorbents, membrane separation, and oxidation treatments have been proposed . Photocatalysis, a well-known oxidation treatment method, has the advantage of direct absorption of light at room temperature where there is phase from the reactive entity that triggers various oxidation and reduction reactions through which the contaminating agent is degraded .One-dimensional AsFeO₃ (AFO) nanofibers fabricated by electrospinning of a solution of Nylon6/AFO followed by calcination were used for photocatalytic degradation of contaminants in water. The AFO fibers were characterized using scanning electron microscopy (SEM), X-ray diffraction (XRD), and UV-Vis spectroscopy. The SEM images of the spun samples demonstrated the successful production of nanofibers and the SEM images of the samples after calcination confirmed the integrity of the continuous AFO nanofibers. XRD analysis indicated the dominant presence of AFO phase throughout the calcinated nanofibers. Photocatalytic activity of the nanofibers and their application in water purification were investigated against 4-chlorophenol (4CP) as a model water contaminant. The results of the UV-Vis spectroscopy show the degradation of the 4CP by means of the photocatalytic activity of the AFO nanofibers. The kinetics of the photodegradation of 4CP is believed to be governed by a pseudo-first-order .kinetics model

کلمات کلیدی:

photocatalytic, nanofibers, water treatment,contaminants,environment

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