عنوان مقاله:

Photocatalytic degradation studies of malachite green dye by hydrothermally synthesized Cobalt Vanadate nanoparticles

محل انتشار:

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خلاصه مقاله:

Cobalt vanadate (Co۳V۲O۸) nanoparticles were prepared by a hydrothermal process using ammonia metavanadate and cobalt nitrate as precursors and calcined at ۴۵۰ ℃ to obtain pure Co۳V۲O۸ nanoparticles. The sample was characterized by scanning electron microscopy, X-ray diffraction, Fourier transform infrared, and UV-visible diffuse reflectance spectroscopy. The characterization analysis confirmed variations in the structure, shape, functional group, and energy gap of Co۳V۲O۸ nanoparticles. Using the Tauc relationship, the energy band gap was determined by analyzing the Tauc curve. The nanoparticles obtained had an average size of ۴۰ nm and found the zeta potential of the nanoparticles was -۷۸ mV, indicating good dispersion and stability. The photocatalytic activity of Co۳V۲O۸ nanoparticles through the degradation of malachite green dye was investigated under UV light irradiation. According to the results, Co۳V۲O۸ nanoparticles showed a maximum removal efficiency of ۸۹ percent in ۶۰ minutes. It shows that synthesized Co۳V۲O۸ .nanoparticles have a strong potential for application as a photocatalyst to degrade textile dyes in wastewater treatment rapidly

کلمات کلیدی:

Cobalt Vanadate, Degradation, Hydrothermal synthesis, Malachite green, Photocatalyst, Wastewater treatment