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Photocatalytic degradation of organic matter with doped ZnO/hydroxyapatite nanoparticles

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PURPOSE OF THE ABSTRACT

This work aims the preparation of new photocatalysts: modified Zinc oxide/hydroxyapatite nanocomposites. ZnO was doped with Cobalt and Silver (Co, Ag) nanoparticles using the Solution Combustion Method (SCM) [1]. Then, the obtained photocatalysts were supported on hydroxyapatite surface using wet impregnation method. Noticing that the Hydroxyapatite was previously prepared by a dissolution/re-precipitation method from a waste of the natural phosphate ore collected from Khouribga region (Morocco). The synthesis of photocatalysts nanocomposite was followed by a thermal treatment that allows a homogeneous dispersion of photocatalytic nanoparticles in the apatite phase [2]. The structure and morphology of the nanocomposites were analyzed using Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), energy dispersive X-ray analysis (EDX). The photocatalytic process was studied under UV light irradiation for the degradation of some pollutants, such as textile dye and 4-nitrophenol. In order to study the photo-degradation efficiency and to improve the photocatalytic properties, the effect of the main parameters: pH, photocatalyst mass, concentration of the pollutant, irradiation power, hydrogen peroxide concentration were investigated, as well as the influence of the presence of inorganic ions.

FIGURES

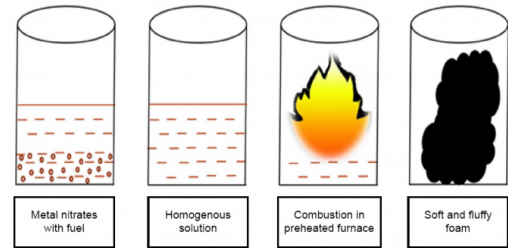
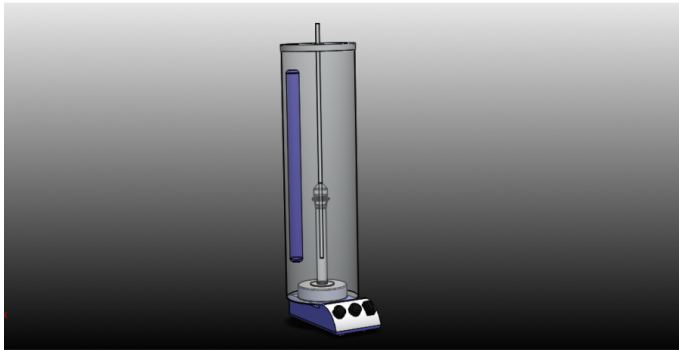


Figure 1 Preparation model of cobalt ferrite magnetic nanoparticles using combustion reaction.

FIGURE 1

the photoreactor

All experiments were carried out in the cylindrical photoreactor made of metal

FIGURE 2

combustion solution method

The SCM was used to synthesize the photocatalyst

KEYWORDS

Photocatalysis | modified zinc oxide | Hydroxyapatite | Nanocomposites

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