Trends in Green chem 2017, 3:3
DOI: 10.21767/2471-9889-C1-006

Degradation of methyl orange in water by visible excitation of a Bi_2WO_6-Fe_2O_3 catalyst

Asmae Bouziani[1], **José Navio**[2], **Abderrahim El Hourch**[1] and **Mohammed El Azzouzi**[1]
[1]Mohammed V University, Morocco
[2]University of Seville, Spain

The development of new photocatalysts is attracting vast interest. Among them the Bismuth tungstate (Bi_2WO_6) is a typical n-type direct band gap semiconductor with a band gap of 2.75 eV and has prospective applications in electrode materials, solar energy conversion and catalysis. In addition it has been found that Bi_2WO_6 might act the same as a stable photocatalyst for the photochemical decomposition of organic contaminants under visible light irradiation. The present study intended to dope Bi_2WO_6 with Fe_2O_3 to prepare Bi_2WO_6-Fe_2O_3 composite and investigate the degradation mechanisms of the composite in the presence of H_2O_2. Methyl orange (MO) is used to imitate no biodegradable, toxic organic compounds. The photocatalytic activity of Bi_2WO_6-Fe_2O_3 to MO in the absence and presence of H_2O_2 is evaluated. Bi_2WO_6-Fe_2O_3 composites were synthesized using a mechanical mixing; by adding the Bi_2WO_6 obtained by hydrothermal method to the corresponding amount of Fe_2O_3 and their photocatalytic activity to degrade methyl orange (MO) under visible light illumination supported with H_2O_2 were studied. The H_2O_2 react with photogenerated electrons leading to the production of hydroxyl radicals ($OH^{\cdot}$). The Fe_2O_3 acts like a Fenton reagent, accelerating the production of $OH^{\cdot}$. Bi_2WO_6-Fe_2O_3/ H_2O_2 system demonstrate much higher photocatalytic efficiency to degrade MO than pure Bi_2WO_6. 50% of MO was degraded in 120 min visible irradiation and the peak disappeared after 90 min, and in Bi_2WO_6-Fe_2O_3 system the peak disappeared after 90 min. This study was performed at pH≈ 6 using Fe_2O_3 as a heterogeneous photo-Fenton catalyst in neutral and weak alkaline conditions of wastewater

asmae.bouziani@hotmail.com

Notes: