

Photocatalytic Degradation of Bisphenol A Using ZnO Nanoparticles as Catalyst under UV/Solar Light: Effect of Different Parameters and Kinetic Studies

Authors : Farida Kaouah, Chahida Oussalah, Wassila Hachi, Salim Boumaza, Mohamed Trari

Abstract : A catalyst of ZnO nanoparticles was used in the photocatalytic process of treatment for potential use towards bisphenol A (BPA) degradation in an aqueous solution. To achieve this study, the effect of parameters such as the catalyst dose, initial concentration of BPA and pH on the photocatalytic degradation of BPA was studied. The results reveal that the maximum degradation (more than 93%) of BPA occurred with ZnO catalyst in 120 min of stirring at natural pH (7.1) under solar light irradiation. It was found that chemical oxygen demand (COD) reduction takes place at a faster rate under solar light as compared to that of UV light. The kinetic studies were achieved and revealed that the photocatalytic degradation process obeyed a Langmuir-Hinshelwood model and followed a pseudo-first order rate expression. This work envisages the great potential that sunlight mediated photocatalysis has in the removal of bisphenol A from wastewater.

Keywords : bisphenol A, photocatalytic degradation, sunlight, zinc oxide, Langmuir-Hinshelwood model, chemical oxygen demand

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