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COMPARISON ON SOLAR PHOTOCATALYTIC DEGRADATION OF ORANGE G AND NEW COCCINE USING ZINC OXIDE AS CATALYST

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Abstract

The mineralization of azo dyes could be realized through solar photocatalytic degradation that is a green method where non-harmful end products are produced. The aim of this study was to investigate the mineralization of Orange G (OG) and New Coccine (NC) using ZnO as catalyst. The degradation of the azo dyes was conducted at different experimental conditions, and parameters such as effect of sunlight to the degradation rate, initial azo dye concentration, amounts of catalyst dosage, pH and effect of aeration to the decolorization of azo dye were investigated. Photocatalytic mineralization of the azo dyes was evaluated through the analysis of UV-Vis spectra, chemical oxygen demand (COD) and ion chromatography (IC) for residual ionic species analysis. The results showed that solar photocatalytic degradation using ZnO was effective for colour removal and the photodegradation rate followed Langmuir-Hinshelwood kinetic model. It was observed that the degradation rate of NC was higher than OG which may be due to the different number of sulphonate ions that are attached on to the azo dye molecule.

Key words: new coccine, orange G, solar photocatalysis, sulphonate group, zinc oxide

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