

Application of Nano Zinc Oxide Sensitized with Natural Dye for Water Disinfection Using Solar Light

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Abstract

In order to solve water contamination problems several procedures are commonly used. Each procedure has its shortcomings, (such as DBPs production and cost. Photodegradation of microorganisms using photo-catalysts (such as ZnO) could be a good alternative.

Photodegradation of microorganisms has been examined in water disinfection. TiO₂ and ZnO photocatalysts have been examined for inactivation of Escherichia coli and some other types of bacteria by photodegradation. ZnO has a wide band gap (3.2 eV), with limited photo-catalytic applications to shorter wavelengths, UV. Because only about 4% of the solar spectrum falls in the UV region, ZnO semiconductor is sensitized by to function in the visible solar light.

In this work, ZnO semiconductor particles were sensitized with safe a low cost sensitizer, anthocyanin. The ZnO/anthocyanin was used to disinfect water from bacteria by photodegradation, using solar simulator light. Nano sized ZnO particles were investigated here.

Key Words: photo-degradation, ZnO, anthocyanin, bacteria.