Abstract

An Efficient Preparation Method of ZnO Nanoparticles toward Enhanced Photocatalytic and Antibacterial Activity [†]

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Abstract: ZnO is an attractive semiconductor material due to its potential application in various fields such as solar cells, antibiotics, gas sensors, organic pollutant degradation, etc. For this purpose, researchers are trying to synthesize ZnO by using different methods such as sol–gel techniques, electrodeposition, mechanochemical and sonochemical methods, and chemical vapor deposition. However, it is still necessary to improve an economical method for synthesizing ZnO. In the present study, we synthesized ZnO nanoparticles (ZnO-NPs) by a thermal method. The process is environmentally safer than other methods because it does not involve more chemicals or a catalyst, acid, or base source. We used methylene blue for photocatalytic activity tests and *Escherichia coli* for antibacterial activity tests. The results found an outstanding degradation percentage (~99%) for the photocatalytic experiment. Moreover, the antibacterial activity was tested at different concentrations, and the minimum inhibitory concentration (MIC) of the ZnO-NPs was 30–50 µg/mL. Our synthesized ZnO-NPs were found to be more effective than previously described ZnO-NPs prepared via other methods.

Keywords: ZnO Nanoparticles; Photocatalytic Activity; Antibacterial Activity

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