

Effect of Ni-doped TiO₂ film on photocatalytic disinfection systems

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Abstract: The purpose of this work is to synthesize and use the visible-light photocatalytic antibacterial activity of nickel-doped TiO₂ nanoparticles to inhibit growth of Gram-positive and Gram-negative bacteria. Anatase phase of titanium dioxide (TiO₂) nanoparticles were synthesized by a modified precipitation method^[1]. After that the TiO₂ thin film layer will be prepared on glass substrate using doctor blade technique. In order to improve the photo response of TiO₂ to the visible region, 0.3wt% of nickel ions will be doped in the titania host lattice. The morphology and nanostructure of the film will be characterized by BET, XRD, and UV-Vis absorption spectratechniques. For photocatalytic inactivation tests two common bacteria pathogens, *Staphylococcus* and *Escherichia coli* will be illuminated with nickel-doped TiO₂ layer^[2]. The red reactive dye solution will be used to investigate the production rates of oxidizing species under a controlled light condition. The result of this work can be applied to kill harmful bacteria in hospitals, health care settings or microbiological lab facilities without producing hazardous waste products.

Keywords: nickel-doped TiO₂, photocatalytic, disinfection, antibacterial

References

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