

Short Communication

Enhancement of Photocatalytic Activity of ZnO Thin Films by Electrochemical Reduction

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Photocatalytic activity of zinc oxide (ZnO) films under UV irradiation was enhanced by electrochemical reduction in an aqueous solution containing phosphoric acid and potassium chloride. The photocatalytic activity of the ZnO films depended on the electrochemical reduction time. The ZnO film with the electrochemical reduction for 20 min exhibited the highest photocatalytic activity for the decomposition of methylene blue (MB). The removal efficiency of MB in the solution was 96.5% after 180 min light irradiation. The photocatalytic activity of the ZnO film with the electrochemical reduction for 20 min was about five times higher than that of the ZnO film without the electrochemical reduction. The enhanced photocatalytic activity of the ZnO film was relatively stable throughout five consecutive cycle experiments. As the electrochemical reduction treatment is performed at room temperature, it is a very simple and effective way to improve the photocatalytic activity of ZnO films.

Keywords: zinc oxide, photocatalyst, electrochemical reduction, metal nanoparticle

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