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Photocatalytic degradation of malachite green dye using Au/NaNbO₃ nanoparticles

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Abstract

The morphology of sodium niobate, which was produced using a hydrothermal method, was studied by changing the hydrothermal temperature from 100 to 250 degrees C. Using 250 degrees C hydrothermal temperature resulted in sodium niobate with a nanocube structure. The sodium niobate nanocubes were doped with gold by impregnation with an aqueous solution of HAuCl₄. The band gap of sodium niobate is approximately 3.4 eV, and it was decreased to 2.45 eV by gold doping. The surface area of sodium niobate is higher than that of Au/NaNbO₃ due to blockage of some pores of sodium niobate by gold doping. The photocatalytic performance of gold-doped sodium niobate was studied by degradation of malachite green dye using visible light irradiation. The results demonstrate that the photocatalytic performance of gold-doped sodium niobate is higher than that of sodium niobate and TiO₂ Degussa under visible light irradiation. (C) 2016 Elsevier B.V. All rights reserved.

Keywords

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