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Organic dye degradation with TiO2 catalyst/AAO template in the presence of H2O2

Abstract

In this study, anodic aluminum oxide (AAO) fabricated from phosphoric acid electrolyte at ambient temperature was used as the porous template, while a sol gel procedure was used for the preparation of the TiO2 sol with the addition of 0.1, 0.3, and 0.5 g of polyethylene glycol (PEG). The addition of PEG to the TiO2 sol prevents surface cracks and improves the adhesion of the sol to the template to produce different surface morphologies which were visible under the scanning electron microscope (SEM). Although, complete degradation of the methyl orange (MO) dye was not achieved initially with the TiO2 coated template, until an oxidizer in the form of H2O2 with different concentrations of 0.029M, 0.088M, and 0.147M were added during the photocatalysis process to shorten the degradation time and to ensure complete mineralization of the MO dye.

Keywords

AAO template; Hydrolysis; Oxidizer; Photocatalysis; Sol gel