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ELECTROCOAGULATION-TiO_2 PHOTO-ASSISTED COMBINED SYSTEM APPLIED TO METHYL ORANGE WASTEWATER REMOVAL

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Abstract

Combined electrocoagulation (EC) and homogeneous phase TiO_2 photo-assisted system were applied to methyl orange (MO) wastewater treatment. Optimum including current density, initial concentration of MO, TiO_2 concentration, pH, solution conductivity and electrode distance were investigated. 98% decolorization (initial concentration = 500 mg/L) was achieved in 30 min with a current density of 125 A/m^2, electrode distance of 2.5 cm, electrolyte KCl concentration of 0.5 g/L, initial pH of 6.86, and TiO_2 concentration of 100 mg/L. Compared with individual EC and TiO_2/UV systems, the combined treatment system of EC-TiO_2/UV enhanced the MO decoloration efficiency (80% removal in 20 min). The energy consumption of EC-TiO_2/UV process for MO removal was about 214 kWh/(kgdye). In this paper, the EC-UV/TiO_2 combined system has been proved to be an efficient technology for MO containing wastewater treatment.

Key words: decolorization, electrocoagulation, methyl orange, photocatalysis

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