

Removal of dimethyl phthalate from water by UV-H₂O₂ process

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Abstract: This study aims to demonstrate the removal efficiency of dimethyl phthalate from water using the UV-H₂O₂ photooxidation process. Pure water samples, spiked with 20 ppm dimethyl phthalate (DMP) were treated by the combined effect of UV photolysis as well as hydrogen peroxide oxidation mechanisms. In the experiments, the concentration of hydrogen peroxide was varied from 34 to 136 ppm and a low-pressure mercury UV lamp of 100 mW power output was used to provide the necessary radiation. The effects of initial concentration of H₂O₂, UV exposure time, pH, and temperature were investigated. The results showed that about 60% of DMP were removed directly by activation caused by UV light radiation intensity after an exposure time of 1 h. However, the removal efficiency increased when the DMP-spiked water was dosed with H₂O₂ prior to irradiating with UV light (i.e., UV-H₂O₂). More than 98% of DMP was removed after 45 min when the UV-irradiated solution was dosed with 136 ppm of H₂O₂. The results also showed that lowering the pH and increasing the temperature enhanced the removal of DMP by UV-H₂O₂ process.