



## Application of the photo-Fenton process to the mineralization of phthalic anhydride in aqueous medium

Souhaila Trabelsi-Souissi<sup>a,b,c</sup>, Nihal Oturan<sup>a</sup>, Nizar Bellakhal<sup>b,c</sup>, Mehmet A. Oturan<sup>a\*</sup>

<sup>a</sup>Université Paris-Est, Laboratoire Géomatériaux et Environnement (LGE), 5, bd. Descartes, 77454 Marne-la-Vallée Cedex 2, France  
Tel. +33 (1) 49 32 49 90 65; Fax +33 (1) 49 32 91 37; email: mehmet.oturan@univ-paris-est.fr

<sup>b</sup>Laboratoire de Chimie Analytique et d'Electrochimie, Faculté des Sciences de Tunis, Campus Universitaire  
2092, El Manar Tunis, Tunisia

<sup>c</sup>Département de Chimie et Biologie Appliquée, Institut National des Sciences Appliquées et de Technologie, 1080 Tunis, Tunisia

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### ABSTRACT

The oxidation of phthalic anhydride, a chemical widely used as plasticizer, was studied in aqueous medium of pH 3 by the photochemical advanced oxidation process "photo-Fenton" using UV irradiation. This process generates, in a catalytic way, the hydroxyl radicals, a powerful oxidant species, for the oxidation of organic pollutants. The kinetics of the oxidative degradation of phthalic anhydride and that of the solution mineralization was investigated through the effect of some operating parameters such as the ratio  $R = [\text{H}_2\text{O}_2]/[\text{Fe}^{3+}]$  and the initial catalyst concentration. The values of  $R = 40$  and  $\text{Fe}^{3+}$  ion (catalyst) concentration of 0.1 mM were found as optimum operating parameters. Mineralization of phthalic anhydride aqueous solution under the optimal conditions was followed by the total organic carbon (TOC) analysis and a high mineralization degree of 98.7% was determined for a treatment time of 2 h.

**Keywords:** Phthalic anhydride; Hydroxyl radicals; Advanced oxidation process; Photo-Fenton; Mineralization

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\* Corresponding author.