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## MINERALIZATION OF TWO PHENYL UREA HERBICIDES IN WATER BY A HETEROGENEOUS PHOTO-FENTON PROCESS

Maria - Magdalena Bobu<sup>1</sup>, Ilie Siminiceanu<sup>\*1</sup>, Elsa Lundanes<sup>2</sup>

<sup>1</sup> "Gh. Asachi" Technical University, Faculty of Chemical Engineering, 71, Blvd. Mangeron, 700050 Iasi, Romania,  
<sup>2</sup> University of Oslo, Laboratory of Chemistry, Norway.

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### Abstract

The paper presents new experimental results on the photodegradation of two important phenyl urea herbicides in water: Monuron and Isoproturon. The photodegradation was performed by two Advanced Oxidation Processes (AOPs): the homogeneous photo-Fenton process ( $UV-H_2O_2 - Fe^{3+}$ ) and a heterogeneous photo-Fenton reaction using an iron pillared Laponite-RD catalyst (Fe-Lap-RD). The Fe-Lap-RD catalyst was prepared from iron nitrate 0.2 M solution and a suspension of Laponite - RD clay. The precipitate was calcinated at 623 K for 20 hours. The product was characterized by XPS/ESCA technique. The main objective of the work was to compare the mineralization degree obtained by the two methods in similar conditions. The initial concentration of the Monuron aqueous solution was of 40 ppm while that of Isoproturon of 25 ppm. The Total Organic Carbon (TOC) measurements have been performed with a TOC Shimadzu analyzer model TOC 5000A. The results have shown that the mineralization degree ( $X_{TOC}$ ) of both herbicides was superior by about 10% when the Fe-Lap-RD catalyst was used. The reaction mechanisms are also proposed on the basis of the experimental results.

*Key words:* photo degradation, Monuron, Isoproturon, water treatment, Laponite RD, photo-Fenton

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\* Author to whom all correspondence should be addressed: [isiminic@ch.tuiasi.ro](mailto:isiminic@ch.tuiasi.ro)