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"Gheorghe Asachi" Technical University of Iasi, Romania

OPTIMIZATION OF PHENOLIC COMPOUNDS ABATEMENT IN OLIVE MILL WASTEWATER BY FENTON'S LIKE TREATMENT WITH H_2O_2/Cu^{2+} UNDER MICROWAVE USING EXPERIMENTAL DESIGN

Hamida Iboukhoulef[1], Abdeltif Amrane[2,3]*, Hocine Kadi[1]

[1]*Laboratoire de Chimie Appliquée et Génie Chimique, Université M. Mammeri, Tizi-Ouzou, Algérie*
[2]*Université de Rennes 1, Ecole Nationale Supérieure de Chimie de Rennes, CNRS, UMR 6226, Avenue du Général Leclerc, CS 50837, 35708 Rennes Cedex 7, France*
[3]*Université européenne de Bretagne*

Abstract

This work describes the application of Fenton's like system (H_2O_2 /Cu^{2+}) assisted with microwaves to the removal of phenolic compounds from olive mill wastewater (OMWs) under microwave. The effect of various operating conditions, namely copper ion concentrations (X_1), hydrogen peroxide (X_2), time of irradiation (X_3) and microwave power (X_4) were evaluated by factorial design of experiments. Results showed that X_1, X_2, X_3 and X_4 had significant effects on the response followed by the interactions X_1X_2, X_1X_3, X_2X_4 and $X_1X_2X_3$.The highest degradation of phenolic compounds was found for 500 mg/L copper dose, a power of 340 W, 12 M H_2O_2 and 8 min irradiation time. FTIR analysis confirmed that microwave degradation of polyphenols by means of the Fenton-like system Cu (II)/H_2O_2 could be an efficient solution for the treatment of olive mill wastewater.

Key words: experimental design, H_2O_2/Cu^{2+}, olive mill wastewater treatment, polyphenols, microwave

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* Author to whom all correspondence should be addressed: e-mail: abdeltif.amrane@univ-rennes1.fr; Phone: +33 223235755; Fax: +33 223238120