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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

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Abstract

This work describes the application of Fenton’s like system (H_2O_2/Cu^{2+}) assisted by microwaves to the removal of phenolic compounds from olive mill wastewater (OMWs). 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+} , microwave, olive mill wastewater treatment, polyphenols

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