



## Coagulation and advanced oxidation processes in the treatment of olive mill wastewater (OMW)

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### ABSTRACT

This paper proposes the use of a combination of two treatment processes for the removal of organic pollutants from the olive oil mill wastewater (OMW). The two treatment processes are, a single coagulation stage followed by a single advanced oxidation, AOP, stage. For the AOP<sub>s</sub>, the following processes were used; UV, O<sub>3</sub>, O<sub>3</sub>/UV and H<sub>2</sub>O<sub>2</sub>/UV depending on the operating time. Two coagulant Al<sup>3+</sup> and Fe<sup>3+</sup> ions were used in the experimental program conducted in this study. The concentration of the chemical oxygen demand (COD) was measured in the effluent of the treated wastewater for each experiment. The percent removal of the COD concentration achieved using the two coagulant Al<sup>3+</sup> and Fe<sup>3+</sup> ions at pH = 9, was 54% and 58%, respectively. In a comparison, the percent removal of the COD is found in the range of 10–39% using an advanced oxidation process alone. The percent removal of the COD concentration achieved using the combined processes, coagulation and AOP<sub>s</sub> (O<sub>3</sub>, O<sub>3</sub>/UV and H<sub>2</sub>O<sub>2</sub>/UV), are 90%, 95% and 94%, respectively. In all experiments conducted, the percent removal of organic contaminants load was directly related to the concentration of organic compounds in the influent of the wastewater.

**Keywords:** Olive mill; Advanced oxidation; Coagulation; COD; Wastewater treatment

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