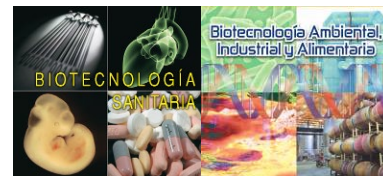


## Poster

# Influence of agitation rate on a semi-industrial photoreactor for olive mill wastewater treatment by photo-Fenton reaction



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**Keywords:** OMWs; Photo-degradation; Photo-Fenton; UV-irradiation.

## ABSTRACT

**Motivation:** Olive mill wastewaters (OMWs) generated in the Mediterranean countries present an environmental problem due to its high organic load and the presence of toxic and inhibition growth compounds such as residual oil matter and phenolic compounds. The various attempts to treat OMWs by conventional methods have not yielded satisfactory results due to the recalcitrant nature of the organic material contained in OMWs (Thanekar, Panda and Gogate, 2018).

Advanced oxidation processes (AOPs) have the capacity to degrade biodegradable and non-biodegradable compounds, in addition to a wide number of persistent organic compounds (Oller, Malato and Sánchez-Pérez, 2011). Photo-degradation with artificial UV-irradiation lamps can accelerate the degradation of pollutants more than dark degradation (Fenton Reaction) (García and Hodaifa, 2017).

**Methods:** In this work, experiments were performed in a semi-industrial batch stirred photo-reactor. The agitation rates were varied in each experiment (60, 150, 300, 400 and 500 rpm). The common operating conditions were initial pH = 3, hydrogen peroxide amount equal to that determined by the reaction stoichiometry, oxidant/catalyst ratio = 0.03, temperature = 20 °C and artificial ultraviolet irradiation.

**Results:** The highest photo-degradation percentage (90%) was registered in the experiment with 500 rpm. In all cases, the TOC removal percentages were increased throughout the reaction. The global removal percentages were decreased when the agitation rate exceeded 300 rpm.

**Conclusions:** Finally, it can be concluded that at this scale the best agitation rate used is 300 rpm and the photo-degradation time needed is higher than 60 min. In these conditions, the TOC removal percentages expected are in the range from 76% to 90%.

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