

## Accepted Manuscript

Title: Mineralization of alkyd resin wastewater: Feasibility of different advanced oxidation processes

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PII: S2213-3437(17)30137-9  
DOI: <http://dx.doi.org/doi:10.1016/j.jece.2017.04.001>  
Reference: JECE 1550

To appear in:

Received date: 24-1-2017  
Revised date: 14-3-2017  
Accepted date: 1-4-2017

Please cite this article as: Shankar B.Kausley, Ketan S.Desai, Surabhi Shrivastava, Parth R.Shah, Bhagwat R.Patila, Aniruddha B.Pandit, Mineralization of alkyd resin wastewater: Feasibility of different advanced oxidation processes, Journal of Environmental Chemical Engineering <http://dx.doi.org/10.1016/j.jece.2017.04.001>

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# Mineralization of alkyd resin wastewater: Feasibility of different advanced oxidation processes

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## Abstract

In the present study, different advanced oxidation processes (AOPs) are compared for their feasibility for mineralization of alkyd resin wastewater. The AOPs studied include: Fenton process, combined ozonation (O<sub>3</sub>) and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), electro-oxidation (EO), wet air oxidation and cavitation using ultrasonic horn (US). The studied AOPs in the order of increasing electrical energy consumption per unit mass of TOC removal (E<sub>EM</sub>) are: Fenton process (18 kWh/kg), EO (83.58 kWh/kg), combined EO and O<sub>3</sub> (187 kWh/kg), wet air oxidation (429 kWh/kg), combined O<sub>3</sub> and H<sub>2</sub>O<sub>2</sub> at pH 8 (477 kWh/kg), combined US, O<sub>3</sub> and H<sub>2</sub>O<sub>2</sub> at pH 8 (776 kWh/kg) and US alone at pH 8 (990 kWh/kg).

Among the studied AOPs and their combinations, the combined O<sub>3</sub> and H<sub>2</sub>O<sub>2</sub> is most promising as it doesn't suffer from complex formation issues as in the Fenton process, EO and combined EO and O<sub>3</sub>, requires lower fixed cost as compared to wet air oxidation and requires less E<sub>EM</sub> as compared to combined US, O<sub>3</sub> and H<sub>2</sub>O<sub>2</sub> and US alone.

**Keywords:** Alkyd resin wastewater; ; ; ; , Advanced oxidation processes, Fenton process, Ozonation, Electro-oxidation, Cavitation.

## Graphical abstract

**Comparison of AOPs for mineralization of alkyd resin wastewater**

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