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## Employing Fenton-like process for the remediation of petrochemical wastewater through Box–Behnken design method

## Aref Shokri<sup>a,\*</sup>, Ahmad Bayat<sup>b</sup>, Kazem Mahanpoor<sup>c</sup>

<sup>a</sup>Department of Chemistry, Payame Noor University (PNU), Tehran, Iran, Tel. +9802122455054, email: aref.shokri3@gmail.com (A. Shokri)

<sup>b</sup>Department of Chemical Engineering, Tafresh University, Tafresh 39518 79611, Iran, email: bayat@tafreshu.ac.ir (A. Bayat)

<sup>c</sup>Department of Chemistry, Faculty of Science, Arak Branch, Islamic Azad University, Arak, Iran,

email: k-mahanpoor@iau-arak.ac.ir (K. Mahanpoor)

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## ABSTRACT

In this study, the wastewater of special economic zone petrochemical plant in Iran was re-mediated through Fenton-like method using  $\text{FeCl}_3$  and hydrogen peroxide. The Box-Behnken design was employed to decrease the amounts of experiments and to perform the statistical exploration of the results. The purpose of this project was to decrease the chemical oxygen demand (COD) of petrochemical wastewater and optimize the COD removal. The effects of operating parameters such as pH, hydrogen peroxide and Iron (III) ion concentration were inspected. The optimal conditions predicted by the model were as the following:  $[Fe^{3+}] = 1.76$  mM, pH at 5.63, and  $[H_2O_2] = 17.86$  mM. The maximum efficiency in the removal of COD by the experiment and model were 72.06% and 74.9%, respectively. Furthermore, other pollutant characteristics including total organic carbon (TOC), biological oxygen demand (BOD), and total dissolved solids (TDS) were decreased considerably.

*Keywords*: Special economic zone petrochemical; Fenton-like process; Advanced oxidation process; COD removal; Box-Behnken design

\*Corresponding author.