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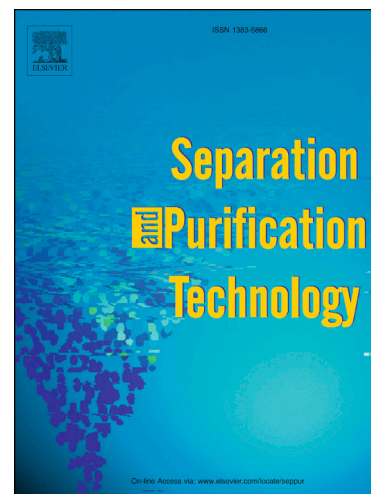
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## Catalytic ozonation of organic contaminants in petrochemical wastewater with iron-nickel foam as catalyst

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### Highlights

Iron-nickel foam was proved to be an effective catalyst for the ozonation of petroleum wastewater. TOC & sCOD was reduced together with the disappearance of various organics.

New generated oxides and hydroxides helped the transformation of  $O_3$  to  $\cdot OH$ .

The ozone utilization efficiency can be significantly enhanced by using iron-nickel foam as the catalyst.

### Abstract

This work investigated the removal of organic contaminants in actual petrochemical wastewater by catalytic ozonation with iron-nickel foam as catalyst. Under different conditions, the DOC removal percentages ranged from 40% to 61%, the sCOD removals were from 73% to 96% in the reaction time of 120 min. Two thirds of the 66 detected organic compounds disappeared in the treated wastewater. The biodegradability of the petrochemical wastewater was greatly improved after catalytic ozonation. TP, TN,  $NO_3-N$ ,  $Cl^-$  and some heavy metals in the petrochemical wastewater were also removed to some extent. The influence of pH and initial organic matter concentration on the performance of catalytic ozonation was limited. Increase of aqueous ozone concentration and catalyst dosage was advantageous for organic contaminants removal. The probable mechanism of catalytic ozonation was proposed

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