



# Optimizing Water Treatment with EK and Fenton Reaction

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## Elevator Pitch

Oil Drilling companies face a significant challenge in managing wastewater contamination. So, for companies involved in oil extraction like ARAMCO, who need an effective and cost-efficient solution to treat wastewater, the EK-F System is a combined Electrokinetic-Fenton treatment that significantly enhances the removal of Total Petroleum Hydrocarbons (TPH). UNLIKE traditional methods, the EK-F System integrates solar power and copper electrodes, providing a sustainable and highly efficient treatment process.

## Objectives

Develop a hybrid treatment system using a combined EK-F system.  
Enhance removal efficiency of TPH.  
Ensure sustainability with integrating the solar panel into our system

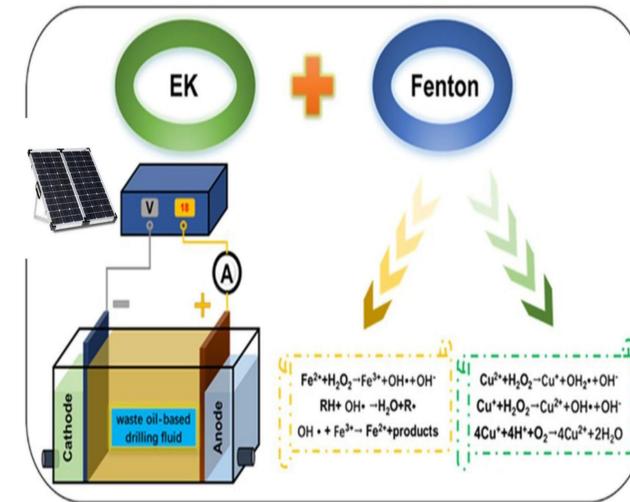
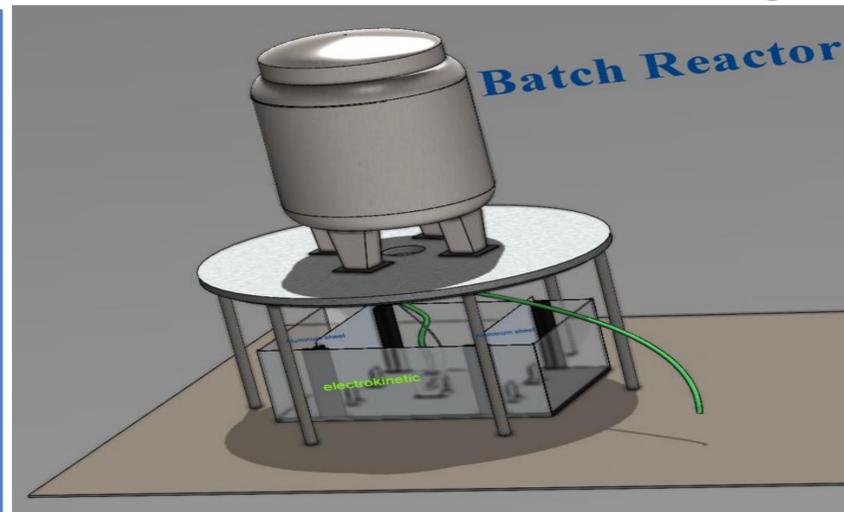
## Constrains

1. Temperature below 60 for EK and between 20-30 for Fenton reaction
2. Voltage gradient between 5-20 v/cm
3. Concentration of H2O2 should be 30% or higher
4. Capacity for at least 20L

## Target Specifications

Final TPH to be less than 8 mg/L  
pH range between 6.5 – 8.5  
Time of process < 36 hours  
Total dissolved solids (TDS) < 2000 mg/L

## Final Design Details



## Validation

- ✓ Voltage regulator
- ✓ Container with a capacity more than 20 L
- ✓ 500 ml of Hydrogen Peroxide (30%)
- ✓ Ph Sensor
- ✓ TDS meter

## Project Impact

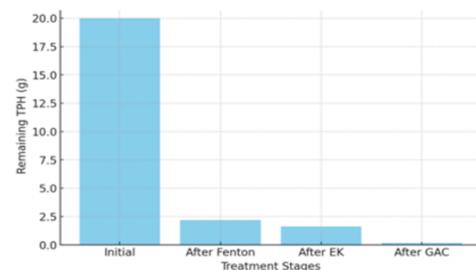
- Efficiency.
- Sustainability
- Collaboration across disciplines.
- Environmental.

## Conclusion

The EK-F System offers an innovative solution for wastewater treatment in the oil drilling industry, effectively tackling the removal of Total Petroleum Hydrocarbons (TPH). By combining the Electrokinetic-Fenton process with solar power and corrosion-resistant aluminum electrodes, our system improves treatment efficiency while promoting environmental sustainability

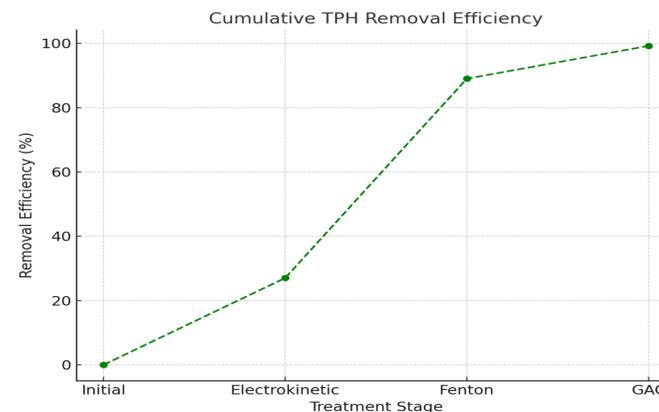
## TPH reduction charts

TPH Calculation



Efficiency :

1. Fenton = 89%
2. Electrokinetic = 27%
3. GAC Filtration = 90%



## Comparison with other treatment process

