

# **Parameters for removing sulfur from Dibenzothiophene using** ultrasonication system and biodesulfurization microbes

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# **Introduction:**

University of Cyprus

Department of Chemistry

The Problem

Sulfur removal from oil

SO<sub>2</sub>

Undesirable Sulfur compounds in liquid fuel

**Biodesulfurization (BDS)** 

OH 2-HBP





Figure 1. Desulfurization pathways: (1) aerobic microorganisms, and (2) anaerobic bacteria.

## **Materials and methods:**

#### **Sample incubation**



#### **Isolation of bacteria**



### **Semi-continuous operation of bioreactors for** biodesulfurization of oil samples





30 min, 25°



#### Isolation of aerobic bacteria

Serratia sp.

Zeolite clinoptilolite

<u>Burkholderia</u> sp.





Figure 2. Picture of the detected microorganism Serratia sp.

Figure 3. Picture of the detected microorganism Burkholderia sp.

### Isolation of anaerobic bacteria

Bacteria species found in various anaerobic samples:



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Results from aerobic experiments in bioreactors



Example from GC-FID analysis of aqueous sample from bioreactor with Burkholderia sp.







Consortium of microorganisms in

relation to aerobic experiments

Burkholderia sp.



# **Conclusions:**

Aerobic bioreactors follow the 4S pathway



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