

عنوان مقاله:

Dibenzothiophene desulfurization by *Rhodococcus erythropolis* SHT λ Y in stirred tank bioreactor

محل انتشار:

بیست دومین کنگره میکروب شناسی ایران (مجازی) (سال: 1400)

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خلاصه مقاله:

Background and Aim : The world is moving towards zero-sulfur fossil fuels. Among the different technologies to remove sulfur from petroleum, biodesulfurization (BDS) is an effective approach. It's based on the sulfur metabolism in some of the living systems including archaeal, bacterial, and fungal members. BDS occurs at ambient temperature and pressure with high selectivity, without undesirable side-products. It significantly reduces sulfur content in a cost-effective manner. In recent years, *Rhodococcus erythropolis* SHT λ Y has been identified and introduced as a bacterium capable of desulfurizing resistant sulfur-containing compounds including dibenzothiophene (DBT) in fossil fuels. **Methods :** *Rhodococcus erythropolis* SHT λ Y was cultivated in a minimal culture medium (BMV) including the phosphate buffer solution, the metals solution, and the vitamins solution. BMV medium had glycerol (5 g/L) and DBT as the only source of carbon and the only source of sulfur. In the middle of the logarithmic phase, the SHT λ Y cells were precipitated by centrifuge and were eluted by the phosphate buffer solution. Then, according to the determined relation between optical absorbance in 660 nm and dry cell weight, the prepared resting cells of SHT λ Y were added to the biphasic system (mixture of 2:1 n-tetradecane/water) up to 10 gDCW/L. DBT concentration was 3 mM and the process was run in a 3L bioreactor (30 °C, pH 6, 400 rpm, and 1 vvm). **Results :** The specific desulfurization activity in the first two hours was measured by HPLC based on 2-HBP production. It was 1.2 micromole 2-HBP/gDCW.min. **Conclusion :** This study demonstrates that *R. erythropolis* SHT λ Y has desired specific activity of DBT desulfurization in the stirred tank bioreactor. Therefore SHT λ Y can be used for improving fossil fuels.

کلمات کلیدی:

Rhodococcus erythropolis SHT λ Y; stirred tank bioreactor; fossil fuels

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