

## Behavior of the growing cells of *Ralstonia eutropha* in biodesulfurization of dibenzothiophene

Azita Dejaloud<sup>1</sup>, Alireza Habibi<sup>2</sup>, Elham jalilnejad<sup>3</sup>, Farzaneh Vahabzadeh<sup>4</sup>

<sup>1</sup>Chemical Engineering Department, Amirkabir University of Technology, Tehran, Iran

dejaloud@aut.ac.ir

### Abstract

The new regulations to lower sulfur content in fossil fuels require new economic and efficient methods for desulfurization of recalcitrant organic sulfur. Hydrodesulfurization (HDS) of such compounds is very costly and requires high operating temperature and pressure. Biodesulfurization (BDS) is non-invasive approach that can specifically remove sulfur from refractory hydrocarbons under mild conditions and it can be potentially used in industrial desulfurization. Biodesulfurization of dibenzothiophene (DBT) by growing cells of *Ralstonia eutropha* in aqueous reaction system was investigated in the present study. DBT and glucose, respectively used as the sole source of sulfur and carbon for growth of *R. eutropha*. The effect of different initial concentrations of DBT (15 and 20 ppm) with a constant level of glucose at 10 g/L on the *R. eutropha* growth and its DBT desulfurization capability and pH variation was studied. Growth behavior of the bacterial cells was generally the same and no significant differences in growth rate were observed in which different initial concentrations of DBT were used. During the first eight hours of cell growth, the pH of medium was decreased. The desulfurization activity of the cells was measured with use of Gibb's reagent and Cells cultivated in the medium containing 15 ppm of DBT showed higher desulfurization activity.

**Keywords:** Biodesulfurization, Dibenzothiophene, *Ralstonia eutropha*, Gibb's reagent.

---

<sup>1</sup> PhD student

<sup>2</sup> Assistant professor

<sup>3</sup> Assistant professor

<sup>4</sup> Professor