

## Removal of Hydrogen Sulfide by Immobilized *Thiobacilli* onto PVP

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### Abstract

A newly *Thiobacillus* sp. IW, *Thiobacillus denitrificans*, and *Thiobacillus thiooxidans* capable of degrading sulfur-containing odour, was immobilized onto PVP to remove H<sub>2</sub>S using a bubble column bioreactor. *Thiobacillus* sp. IW is exceptionally fast growing compared with other sulfur-oxidizing bacteria of *Thiobacillus denitrificans* and *Thiobacillus thiooxidans*. Three kinds of *Thiobacilli* could oxidize thiosulfate to sulfate as the final product. We conclude that sulfate concentrations accompanied by the increase in the cell growth increased and thiosulfate concentration increased. The efficiency of H<sub>2</sub>S removal was 6-18 times faster than those of *Thiobacillus denitrificans* and *Thiobacillus thiooxidans*. According to these results the growth of *Thiobacillus* sp. IW is the fastest compared with other *Thiobacilli*. The faster the cell growth, the faster H<sub>2</sub>S removal. The removal efficiencies of 99% were observed in the range of inlet H<sub>2</sub>S concentration from 200 to 2200ppm at a constant gas flow rate 19.2L/min. *Thiobacillus* sp. IW immobilized onto PVP showed better removal performance. Regenerated immobilized PVP did not show marked pH change during the course of experiment compared to fresh immobilized PVP. Therefore it is indicated that PVP, which lost activity, can be reused.

### 감 사

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### References

1. Altaf H. Wani, Richard M. R. Branion, Anthony K. Lau (1997), Biofiltration: A promising and cost-effective control technology for odors, VOCs and air toxics, *J. Environ. Sci. Health* **A32**(7), 2027-2055.