

Walailuk Doungprasopsuk 2010: Hydrogen Sulfide Removal by Autotrophic Bacteria from UASB Effluent. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Patcharaporn Suwanvitaya, M.App.Sc. 89 pages.

Removal of hydrogen sulfide from biogas is commonly achieved by costly chemical process. Biological process that changes the gas into other less toxic forms is an interesting alternative. Many types of microorganisms, either autotrophic or heterotrophic, are capable of utilizing hydrogen sulfide for their growth. UASB effluent contains mixed cultures of these microorganism including *Thiobacillus* sp.

In this study, UASB effluent of food factory was used. It was found to contain 1.4×10^4 MPN/100ml of *Thiobacillus denitrificans* and 9.2×10^4 MPN/100ml *Thiobacillus thioparus*. Specific growth rate of *Thiobacillus thioparus* in *Thiobacillus* medium was found to be 0.258 d^{-1} , higher than 0.078 d^{-1} of *Thiobacillus denitrificans* in *Thiobacillus denitrificans* medium. Both isolates grew well on bioballs in biofilter column.

In biotrickling filter column experiment with hydrogen sulfide replacing sodium thiosulfate in the culture media, 30% H_2S was reduced in abiotic column with 15% found in the effluent. Higher removal percentage was achieved by inoculated column 44-68% by *Thiobacillus denitrificans* and 60-82% by *Thiobacillus thioparus*. It was also found that 8.89 and 8.85 % dissolved in the effluent. The highest concentration of H_2S with the highest removal were 1380 mg/L and 2700mg/L respectively.

Student's signature

Thesis Advisor's signature