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Abstract: Highly toxic and corrosive gas H₂S is recognized as one of the hazardous air pollutants which has significant effect on the human health. Abatement of H₂S gas from the air is very necessary. H₂S gas is mainly released from the industries like paper and leather industry as well as during the production of crude oil, during wastewater treatment, etc. But the emission of H₂S gas in high concentration may cause immediate death while at lower concentrations can cause various respiratory problems. In the present study, self priming venturi scrubber is used to remove the H₂S gas from the air. Response surface methodology with central composite design has been chosen to observe the effect of process parameters on the removal efficiency of H₂S. Experiments were conducted by varying the throat gas velocity, liquid level in outer cylinder, and inlet H₂S concentration. ANOVA test confirmed the significant effect of parameters on the removal efficiency. A quadratic equation has been obtained which predicts the removal efficiency very well. The suitability of the developed model has been judged by the higher R² square value which obtained from the regression analysis. From the investigation, it was found that the throat gas velocity has most significant effect and inlet concentration of H₂S has less effect on H₂S removal efficiency.

Keywords: desulfurization, pollution control, response surface methodology, venturi scrubber

Conference Title: ICEESD 2019: International Conference on Energy, Environment and Sustainable Development

Conference Location: Paris, France

Conference Dates: January 24-25, 2019