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Master Thesis Defense

Entitled

The impact of wastewater chemistry and flow characteristics on hydrogen sulfide concentration

by

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(Streaming: <https://uae-u-ac-ae.zoom.us/j/87843584075>)

Abstract

Hydrogen sulfide (H₂S) is a naturally occurring, highly toxic gas that is formed from the decomposition of sulfur compounds. At low concentrations, H₂S is an irritant for the eyes, respiratory and gastrointestinal tract. At higher H₂S concentrations, it produces neurological impairment with dizziness, headache, and loss of consciousness. Mortality was reported to reach 6 percent following exposure to elevated concentrations. H₂S is generated in different industrial processes. In wastewater collection and treatment plants, H₂S is a common source of concrete and metal corrosion that has resulted in huge economic loss. In this project, the factors leading to the generation of H₂S in sewer has been studied. Different parameters were measured from Al-Saad wastewater treatment plant, UAE. Wastewater samples were collected for measurement of chemical properties affecting H₂S generation in the laboratory. Significant parameters were identified from the collected data using correlation analysis and correlated with corresponding H₂S concentration. Statistical equations formed from this regression analysis was used to estimate the H₂S concentration in headspace. A neural network model was developed to predict H₂S emission at different wastewater unit operations. Studying the generation of H₂S in sewers would in effect help alleviate the maintenance costs of wastewater treatment systems.