

## Hydrogen sulfide emission sources, regulations, and removal techniques: a review

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### ABSTRACT

This review highlights the recent technologies of H<sub>2</sub>S removal from wastewater in the petroleum refinery. H<sub>2</sub>S is a harmful, putrid, and hazardous gaseous compound. The main processes such as physicochemical, chemical, biological, and electrochemical methods were compared and discussed in detail. The effects of various parameters and adsorbent characteristics were highlighted and correlated with the adsorption capacities. Surface functional groups and porosity surface area play a crucial role in the process of single-phase and composite adsorbents. Composite materials impregnated with some metals showed high removal efficiencies. It was found that the adsorption process is the most relevant way for H<sub>2</sub>S removal due to its high removal efficiency, low cost, eco-friendly, and operational simplicity. This study serves as a useful guideline for those who are interested in H<sub>2</sub>S removal

**KEYWORDS:** emission; hydrogen sulfide; petroleum refinery; toxicity and removal; water treatment

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