High surface area mesoporous silica for hydrogen sulfide effective removal

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Abstract: Background: Removal of sulfur-containing compounds from the aqueous environment is necessary as these compounds pose potential risks to human health, hygienic management and bring great economic losses due to fouling of resin bed and corrosion of process equipment.

Objective: This work aims to study the H2S removal efficiency using high surface area mesoporous silica (MCM–41).

Method: In this study, mesoporous silica (MCM–41) with a high surface area of 1270 m^2/g and high porosity of 69% was prepared by sol-gel technique.

Results: The obtained MCM–41 has exhibited a superior performance in adsorbing H2S from wastewater with a maximum adsorption capacity of 52.14 mg/g. The adsorption isotherm and kinetics of the current adsorption process are best represented by Freundlich isotherm and pseudo-second-order models, respectively**.**

Conclusion: Therefore, MCM–41 is an excellent adsorbent for wastewater treatment applications.

Keywords: Mesoporous Silica, Sol-Gel, Hydrogen Sulfide, Adsorption, Wastewater treatment.