

## H<sub>2</sub>S adsorption properties of PEI-based sorbents using various silicas

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The removal of H<sub>2</sub>S is very important in various industrial gases such as coal/biomass gasification, natural gas, biogas, synthesis gases, reformat gas and other because H<sub>2</sub>S is not only major toxic gas and malodorous gas, but also a corrosive gas towards pipelines and equipment. Therefore, it is necessary to improve the desulfurization processes. In this study, The PEI-based sorbents were prepared by an impregnation loading of polyethyleneimine (PEI) on various silicas such as fumed silica (PF40), SBA-15 (PS40), and KIT-6 (PK40). The H<sub>2</sub>S capture capacity calculated from the H<sub>2</sub>S breakthrough curves were 1.98, 1.25, and 0.81 mmol S/g sorbent, respectively. The PF40 sorbent had an excellent the H<sub>2</sub>S capture capacity, compared to PS40 and PK40. The PF40 sorbent had a large pore volume during spherical shape formation, which was found to have good reactivity with H<sub>2</sub>S. And PEI loading of 40 wt% is optimal content for H<sub>2</sub>S removal. The PF40 sorbent developed in this study showed a H<sub>2</sub>S capture capacity of about 1.98 mmol S/g sorbent and no deactivation during the sorption-desorption cycles.