

Desulfurization performance of several Zn-based dry sorbents in a fluidized-bed for different coal-gasified syngas compositions

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In this study, we investigated the effect of reducing power (RP) and the content of H₂O in the coal-gasified syngas on desulfurization efficiency using bench-scale fluidized-bed reactor. We used three different Zn-based dry sorbents such as ZTO-26, ZAC-C and ZAC-32N, which were manufactured using spray dry method. We used three different gasification conditions such as Kellogg-Rust-Westinghouse (KRW) air-blown gasification (RP: 1.83), Shell oxygen-blown gasification (RP: 41.56) and Institute of Advanced Engineering (IAE) gasification (RP: 4.77). We varied the content of H₂O from 5% to 30% and the inlet H₂S concentration from 0.5% to 2%. As a result, the desulfurization efficiency decreased as the content of H₂O increased regardless of RP. Even though the outlet H₂S concentration increased as the inlet H₂S concentration increased, the desulfurization efficiency was maintained above 99.5% at even high RP condition.