

The sulfidation properties of Zn-Ti-based desulfurization sorbent in various hot coal gas composition

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The sulfur removing capacities of Zn-Ti-based sorbents prepared by co-precipitation were tested in various hot coal gas compositions using a fixed-bed reactor at 1 atm and middle-temperature condition (sulfidation : 480°C, regeneration : 580°C). The sulfur removing capacities of the sorbents were measured by a thermal conductivity detector (TCD) and flame photometric detector (FPD). The hot coal gas composition usually consisted of five gases which were H₂S, CO₂, CO, H₂, N₂. The concentrations of the H₂S and CO₂ gases were fixed to 1.5 % and 2 %, and those of H₂ and CO gases were changed from 0% to 55%, respectively. The sulfur removing capacities of the sorbents were not affected with the increase of the H₂ gas and decreased with the increase of the CO gas. In addition, in the case of the condition of the CO 55% without H₂ gas, the SO₂ gas was produced in the initial reaction when H₂S gas removed. This phenomenon was not indicated in the condition with H₂ gas above 20%. The role of gases and the sulfur removing capacity of the sorbent in various gas conditions were discussed.