

## The regeneration properties of Zn-Al based desulfurization sorbents promoted with CeO<sub>2</sub> and Fe<sub>2</sub>O<sub>3</sub>

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Zn-Al based desulfurization sorbents promoted with Fe<sub>2</sub>O<sub>3</sub> and CeO<sub>2</sub> were prepared by co-precipitation method to improve the regeneration properties of ZnO-Al<sub>2</sub>O<sub>3</sub>(ZA)sorbent. Their sulfur removing capacities and regeneration properties were measured in a fixed bed reactor during multiple cycles at middle temperatures in the range of 480 – 580°C. In the case of ZA promoted with Fe(ZAF) sorbent, the sulfides formed during sulfidation were defined as ZnS and FeS from X-ray diffraction. Iron sulfides were regenerated at a lower temperature than that of ZnS and the regeneration properties of ZnS were improved even at low temperatures through the heat produced in the reaction of iron sulfides that were converted into oxide phases. In the case of ZA promoted with Ce(ZACe) sorbent, CeO<sub>2</sub> was not changed to sulfide form during sulfidation. This promoter plays an important role in transforming S into SO<sub>2</sub> which can easily desorb from the ZnS. In particular, ZA sorbent promoted simultaneously with Ce(5wt%) and Fe(5wt%) was excellent for regeneration although sulfur removing capacities of these sorbents were partially decreased compared with that of ZA sorbent in middle temperature.