

Development regenerable MgO based sorbent promoted with Cobalt and Iron oxide for SO_x removal

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Sulfur oxides (SO_x) can be formed by oxidation of sulfur in fossil fuel and emitted from the industrial processes such as a catalyst regeneration unit of RFCC and FCC. In this study, the MgO-based sorbents promoted with Co and Fe were tested for the removal of SO_x and their abilities of SO₂ absorption as well as regeneration were investigated in a Fixed-bed under RFCC and FCC conditions (sulfation of MgO to MgSO₄ in the presence of low concentration of SO_x at 700°C, regeneration of MgSO₄ to MgO and H₂S in the presence of H₂ at 530°C). The promoter, Cobalt played an important role in oxidation SO₂ into SO₃ which could be easily absorbed to the MgO and Iron improved the regeneration property of the sorbent. It was also found that the sulfur removing capacity and regeneration property of the MgO based sorbents promoted simultaneously with Co and Fe depended on the preparation method(coprecipitation, physical mixing and impregnation method). The sorbent prepared by impregnation of Fe to the Co-MgO prepared by coprecipitation of Co and MgO showed the excellent sulfur removing capacity and regeneration property. Characterization of sorbents promoted with Co and Fe were discussed by the results of FT-IR, XRF, BET.