

Potassium based dry sorbents for SO₂ removal at low temperature

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Sulfur oxides(SO_x) can be formed by oxidation of sulfur in fossil fuel and emitted from the industrial processes. The emission of waste gas streams containing sulfur oxides into the atmosphere is environmentally undesirable. In this study, the potassium-based dry sorbents were prepared by impregnation of potassium carbonate or potassium hydroxide on the alumina supports. The SO₂ absorption was tested in a fixed-bed at low temperature conditions(30~60°C in the presence of 5000 ppm of the SO₂). Their abilities of SO₂ absorption were investigated under the various the H₂O concentrations(1 vol%~9 vol%) and absorption temperatures. It was found that the SO₂ removing capacities of potassium based sorbents increased with the H₂O concentration in our experimental range. In particular, the K₂CO₃/Al₂O₃ sorbent showed excellent SO₂ removal capacity(0.34 SO₂ g/ sorbent g) even at 5vol% H₂O and 30°C. Characterization of sorbents by the results of XRD, FT-IR and BET were carried out and the results were discussed.