

Selective Oxidation Of Hydrogen Sulfide Using CeO₂-TiO₂ Catalysts

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TiO₂ has been a good catalyst and support in selective oxidation of hydrogen sulfide. Preparation of catalyst by sol-gel method improved the activity of catalyst comparing to other preparation method. In the present work, CeO₂-TiO₂ catalysts were synthesized by using sol-gel method, and their catalytic performance was studied for the selective oxidation of H₂S to elemental sulfur. The obtained catalysts were characterized by XRD, BET surface area measurements, XPS, H₂-TPR, and NH₃-TPD. The reaction tests were carried out in a continuous flow fixed-bed reactor at temperature ranging from 220-300 °C. The conversion of H₂S increased with increasing temperature for CeO₂-TiO₂ catalysts, while the selectivity to SO₂ remained almost constant. TiO₂ species present in the catalyst plays the main role in the activity shown by the CeO₂-TiO₂ catalysts. CeO₂-TiO₂ (1:3) showed higher activity than that of TiO₂, and the highest conversion of hydrogen sulfide among other catalysts. Conversion of H₂S decreased with the increase of CeO₂ content. The good catalytic performance may be due to the high surface area and the presence of acid sites.