

The Role of Defects in Sulfur Removal over Titanium Dioxide

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The desulfurization of organosulfur compounds, particularly refractory aromatic compounds, is of great interest given the increasingly strict limits on sulfur emission from the combustion of petroleum. In examining the removal of sulfur from such compounds over reduced TiO_2 we have observed that significant reduction of the substrate can induce desulfurization in, for example, benzenethiol (shown). We plan to further modify the surface to study the removal of S from other thiophenes, particularly larger, more stable thiophenes, which are harder to remove from petroleum. By employing temperature programmed reaction spectroscopy and X-ray photoelectron spectroscopy, we can probe the role of the oxide substrate and its defects in desulfurization reactions.

