

The properties of Zn-Ti-based desulfurization sorbent prepared by various co-precipitation method

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Sulfur removing capacities and regeneration properties of Zn-Ti sorbents prepared by various co-precipitation method were tested in micro reactor at 1 atm and middle-temperature condition (sulfidation : 480°C, regeneration : 580°C). The various co-precipitation methods are controlled by the precursor, pH, aging time. In the case of Zn-Ti sorbent precipitated by NaOH, its sulfur removing capacity showed the 16 g S/g sorbent and no deactivation during multiple sulfidation and regeneration cycles. While, that of Zn-Ti sorbent precipitated by NH₄OH showed 14 g S/g sorbent and deactivated during multiple cycles. The sulfur removing capacity of Zn-Ti sorbent precipitated until pH 10 is better than that of Zn-Ti sorbent precipitated until pH 8. The suitable aging time is between 12 hr and 18 hr. The difference in the sulfur removing capacities and regeneration properties of these sorbents were thought to be due to their crystal structures and physical properties measured by using X-ray diffraction, BET and TEM images before/after H₂S reaction, which were deeply related with preparation method.