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First page example

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Key words: Attapulgite, CaO, desulfurization, SO_2, adsorption, catalysis

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Introduction

Lime/gyp method is a conventional dry desulfurizing method, which uses CaO or $Ca(OH)_2$ as desulfurizers. The lime/gyp method is considered to be more effective and cheaper than other desulfurizing methods, such as activate carbon adsorption and Claus recycle, etc.. But the calcium-based desulfurizer has a big problem: It was easily scaling during the process of desulfurization, because $CaSO_4$, whose molar volume is three times as much as CaO, was generated, and the micro pore of desulfurizer would soon be jammed by $CaSO_4$, which prevented the reaction and decreased SO_2 removal efficiency [1-4].

The attapulgite (ATP) is a chain material with structural formula $[(OH_2)_4(Mg,Al,Fe,)_5(OH) \cdot 2Si_8O_{20}] \cdot 4H_2O$. The structure of ATP results in zeolite-like channels. The researchers had studied its properties[5-7], and some concerned about the aspect of modifying material of compound material[8]. Because of its structural morphology, ATP has received considerable attention with regard to the adsorption on the clay surfaces and to their use as support for catalysts [9,10]. The studies of using attapulgite as a desulphurizer had less reported. In this study, a kind of new desulfurizer, made of ATP and CaO, was prepared, and its properties were studied.

Experimental

Material. Attapulgite clay was produced from Linze, Gansu, China(60-mash sieve, specific surface area 110~150m^2/g), with ATP content of 31%~57%, illite and kaolinite content of 18%~23%, quartz and feldspar content of 15%~25%, dolomite and montmorillonite content of trace. The other reagents supplied by their manufacturers was all analytical pure.