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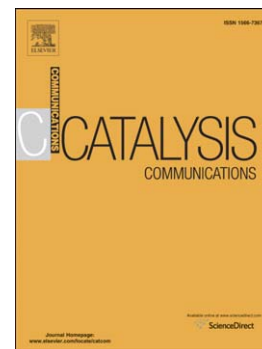
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Self-assembly heteropoly acid catalyzed oxidative desulfurization of fuel with oxygen

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Abstract: The self-assembly heteropoly acid solution can be directly used for catalyzing oxidative desulfurization (ODS) of model fuel with O₂ as oxidant in high sulfur removal. The sulfur compounds in model fuels all can be nearly completely oxidized. The oxidation mechanism of thiophenic sulfurs is proposed. In the ODS process, the self-assembly heteropoly acid solution acts as both the catalyst but also the excellent extracting agent, and the oxidation and extraction are performed simultaneously.

Key words: heteropoly acid; oxidative desulfurization; oxygen; model fuel

1. Introduction

It is well known that fuel combustion releasing SO_x is currently one of the important sources of air pollution. In addition, trace amounts of sulfur also can poison the noble metal catalyst in the application of fuel. Therefore, deep desulfurization of fuel has been becoming an urgent problem for us to solve [1,2]. Due to some shortcomings of conventional hydrodesulfurization (HDS), non-HDS techniques including extractive desulfurization [3], adsorptive desulfurization [4], oxidative desulfurization (ODS) [5-7], biodesulfurization [8], ultrasound desulfurization [9] and etc. have gathered people's attention. ODS has been considered as one of the promising methods for deep desulfurization [10-12]. In most developed ODS systems with oxygen (O₂) as oxidant

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