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催化剂

Pt/ZrO2- Al2O3 催化剂芳构化反应性能研究

方大伟[1];马爱增[2];潘锦程[2]

北京石油化工科学研究院第三研究室301组[1]

石油化工科学研究院[2]

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摘要 在微型反应装置上考察以ZrO2和γ-Al2O3为载体负载Pt的单金属催化剂和多金属催化剂的反应活性、选择性、稳定性. 实验结果表明，以ZrO2和γ-Al2O3为载体负载Pt的单金属催化剂ZAP具有非常好的正庚烷转化活性和甲苯选择性，而裂化性能较弱，反应初期正庚烷转化率为87.5%，甲苯收率达到33.0%，C3+C4收率在10.5%左右，但积炭速率较快，催化剂的稳定性略差；ZrO2和γ-Al2O3复合载体和单纯γ-Al2O3载体的酸性相当，在Pt/ZrO2-γ-Al2O3体系中引入La，抑制了催化剂的脱氢环化活性和加氢裂化性能，随着催化剂中La含量的增加，这种抑制作用更加明显。Sn的引入增强了催化剂的酸性，在高温高压下反应，含0.1%Sn的催化剂的裂化活性提高，而较高含量的Sn（0.3%）的加入明显降低了催化剂的反应活性和选择性。

关键词 催化重整 芳构化 催化剂

分类号

STUDY ON THE AROMATIZATION PERFORMANCE OF Pt/ZrO2-γ-Al2O3 CATALYST

Ma Aizeng

Abstract

The reaction activity, selectivity and stability of single-metal and multi-metal Pt catalysts with ZrO2 and γ-Al2O3 composite carrier were tested in a micro-reactor using n-heptane as feed. The results showed that Pt/ZrO2-γ-Al2O3 catalyst exhibited good activity and selectivity, the conversion of n-heptane, the yields of toluene and C3+C4 were 87.5%, 33.0% and 10.5%, respectively. Yet the catalyst was easy to be coked and its reaction stability needed to be improved. The acidity of ZrO2-γ-Al2O3 composite carrier and γ-Al2O3 was similar. Adding La to Pt/ZrO2-γ-Al2O3 system suppressed the reaction activity of dehydrocyclization and hydrocracking, and the activity decreased with the increase of La content. The acidity of the catalyst could be increased by adding Sn to the catalyst system. It was found that the hydrocracking activity of the catalyst was enhanced by adding 0.1% Sn, yet higher Sn content, e.g. 0.3%, could have negative effect on the reaction activity and selectivity.

Key words catalytic reforming aromatization catalyst

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通讯作者 方大伟 fangdw@ripp-sinopec.com

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