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研究论文

Conversion of Isobutane in Presence of Carbon Dioxide over Molybdenum Oxide Catalysts Obtained from Heteropolymolybdate Precursors

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- 摘要
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- 相关文章

摘要 Molybdenum based oxide catalysts Mo-H, Mo-Fe, Mo-Ce, and Mo-Sn were prepared by calcining $H_3PMo_{12}O_{40}$, $Fe_{1.5}PMo_{12}O_{40}$, $Ce_{1.5}PMo_{12}O_{40}$, and $Sn_{1.5}PMo_{12}O_{40}$ heteropolyanion precursors at 700 ° C, respectively. The prepared oxides have been characterized and tested for the dehydrogenation of isobutane (IB) to isobutene in the presence of CO_2. The effects of temperature, time on stream, and CO_2/IB ratio were investigated. It was found that α- and b-MoO_3 phases were present in all catalysts. Catalytic tests showed that increasing the reaction temperature increased both the conversion and isobutene selectivity, whereas increasing the CO_2/IB molar ratio increased the conversion but decreased the selectivity for isobutene. Iron was found to be an effective additive element for the enhancement of catalytic activity compared with Ce and Sn.

关键词： isobutane isobutene heteropoly compound mixed oxide carbon dioxide

Abstract： Molybdenum based oxide catalysts Mo-H, Mo-Fe, Mo-Ce, and Mo-Sn were prepared by calcining $H_3PMo_{12}O_{40}$, $Fe_{1.5}PMo_{12}O_{40}$, $Ce_{1.5}PMo_{12}O_{40}$, and $Sn_{1.5}PMo_{12}O_{40}$ heteropolyanion precursors at 700 ° C, respectively. The prepared oxides have been characterized and tested for the dehydrogenation of isobutane (IB) to isobutene in the presence of CO_2. The effects of temperature, time on stream, and CO_2/IB ratio were investigated. It was found that α- and b-MoO_3 phases were present in all catalysts. Catalytic tests showed that increasing the reaction temperature increased both the conversion and isobutene selectivity, whereas increasing the CO_2/IB molar ratio increased the conversion but decreased the selectivity for isobutene. Iron was found to be an effective additive element for the enhancement of catalytic activity compared with Ce and Sn.

Keywords： isobutane, isobutene, heteropoly compound, mixed oxide, carbon dioxide

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