

第二金属对 Co/SiO₂ 加氢催化剂结构和性能的影响

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摘要 通过考察 Co/SiO₂ 催化剂中活性组分的结构变化及其催化乳酸酯液相氢化反应结果, 来研究第二金属添加物对催化剂结构及其催化性能的影响。结果表明, 随着金属添加物的加入双金属催化剂中金属 Co 的表面电子性质以及分散度不断变化, 而 Co 物种颗粒粒径不断减小, 因此 Co 物种和载体 SiO₂ 间相互作用不断增强, 从而降低 Co 还原度。乳酸酯氢化反应结果表明, 催化剂中活性组分的颗粒大小及其比表面积以及 Co 物种的还原度和分散度均影响其氢化反应的活性。

关键词: 钴 金属添加物 结构 乳酸酯 氢化

Abstract: The effects of metal additives (Zn, Fe, Cu, and Sn) on the properties and catalytic performance of a Co/SiO₂ catalyst (prepared by a co-precipitation method) in the liquid-phase hydrogenation of ethyl lactate were investigated. The electronic properties and surface distribution of Co in the catalyst were significantly changed by incorporation of the additives. The particle size of the cobalt species was reduced, which strengthened the interaction between the cobalt particles and the silica support and decreased the reducibility of the catalyst. As a consequence, both ethyl lactate conversion and 1,2-propanediol selectivity decreased upon incorporation of the additives. Ethyl lactate conversion was related less to the size and surface area of the catalyst particles than to the distribution of the cobalt species and the reducibility of the catalyst.

Keywords: cobalt, metal additive, structure, ethyl lactate, hydrogenation

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