中国化学工程学报 2004 12(3) 379-383 ISSN: 1004-054x CN: 11-3638

REACTION KINETICS, CATALYSIS AND...

苯烷基化固体酸催化反应器中流化相反应动力学研究
柳伟山, 钟炳, 李元, 孟祥

Department of Chemical Engineering, Tsinghua University, Beijing 100084 China
柳伟山等: 清华大学 化学工程系 北京 100084

摘要: For the alkylation of benzene with long-chain olefins, using HβZeolite catalyst as replacement of HF or AlCl3 has the advantages of no corrosion, leasenvironmental pollution, and much more 2-phenyl isomer, which has the highest biodegradability and solubility, and better detergent properties among the related isomers. The characterization of the coke shows that the deactivation of catalyst is caused by the jam of bulkier molecules, such as naphthalene, indane and linear alkylbenzenes, which are too big to move quickly in the intercrystalline pores of catalyst. The deactivated catalyst can be regenerated by benzene washing at higher temperature. To make the processes of reaction and regeneration continuous, a novel moving bed reactor is developed. Comparing with the processes with fixed bed reactors, the processes in this work have the advantages of continuous operation, low temperature, low pressure, low mole ratio of benzene to olefins, and high weight hourly space velocity.

关键词: 直链烯烃; 苯烷基化; 固体酸; 反应器; 流化床
分类号:
DOI:

Synthesis of Linear Alkylbenzene in a Novel Liquid-Solid Circulating Moving Bed Reactor

BAI Ringbao, YU Long, CUI Zhu, ZIN Yong
Department of Chemical Engineering, Tsinghua University, Beijing 100084 China

Received Revised Online Accepted

Abstract For the alkylation of benzene with long-chain olefins, using HβZeolite catalyst as replacement of HF or AlCl3 has the advantages of no corrosion, leasenvironmental pollution, and much more 2-phenyl isomer, which has the highest biodegradability and solubility, and better detergent properties among the related isomers. The characterization of the coke shows that the deactivation of catalyst is caused by the jam of bulkier molecules, such as naphthalene, indane and linear alkylbenzenes, which are too big to move quickly in the intercrystalline pores of catalyst. The deactivated catalyst can be regenerated by benzene washing at higher temperature. To make the processes of reaction and regeneration continuous, a novel moving bed reactor is developed. Comparing with the processes with fixed bed reactors, the processes in this work have the advantages of continuous operation, low temperature, low pressure, low mole ratio of benzene to olefins, and high weight hourly space velocity.

Key words Keywords: alkylation; linear alkylbenzene; catalyst; reactor;

通讯作者:
柳伟山 liuweishan@flex.com
作者个人主页: 柳伟山, 钟炳, 李元, 孟祥

下载功能
相关信息
Abstract(1)
Supp info(1)
Related Articles
Citation in ISI
Citation in SCI
Citation in EI
Citation in CSCD
Citation in CNKI
Citation in Baidu
Citation in Google
Citation in Yahoo
Citation in Bing
Citation in Sogou
Citation in Wenxian
相关文章
在本期文章中搜索关键词 "直链烯烃; 苯烷基化; 固体酸; 反应器; 流化床"
本文作者相关文章
Liu,W.S.
Zhong,B.
Li,Y.
Meng,X.