中国化学工程学报 2004 12 (3): 498-414 ISSN: 1004-616x CN: 44-1062/R

REACTION KINETICS, CATALYSIS AND-----

.

强制不稳态环歧反应器网络的特性

DavideFISSORE, Antonello A.BARRESI, ,Salvatore VELARDI, ,MarcoVANNI

Dipartimento di Scienzadei Materiale Ingegneria Chimica, Politecnico di Torino, Corso Ducadegli Abruzzi24, 10129 Torino, Italy

收稿日期 修回日期 网络版发布日期 接受日期

摘要 The multi-reactors network, a closed sequence of two or more catalytic fixed bed reactors with periodical change of the feed position, was studied by means of numerical simulations. Two advantages of such a reactor configuration, the possibility of exploiting the thermal storage capacity of the catalyst and the optimal temperature profile for exothermic equilibrium-limited reactions, were analyzed. The former feature acting as a regenerative heat exchanger was simulated in the case of the combustion of lean volatile organic compound (VOC) mixtures, with the possibility of multiple stability windows found when rich mixtures are fed. The latter was demonstrated using the methanol synthesis, with the enhancement of the conversion and product selectivity predicted. The influence of the number of the reactors in the network was pointed out. Some results obtained in the reverse-flow reactors were also presented for comparison.

关键词 化学反应器; 甲醇; 反应工程学; 燃烧; 有机化合物

分类号

DOI:

On the Properties of the Forced Unsteady-state Ring Reactor Network

DavideFISSORE, , Antonello , A.BARRESI, , Salvatore , VELARDI, , MarcoVANNI

Dipartimento di Scienzadei Materiale Ingegneria Chimica, Politecnico di Torino, Corso Ducadegli Abruzzi24, 10129 Torino, Italy

Received Revised Online Accepted

Abstract The multi-reactors network, a closed sequence of two or more catalytic fixed bed reactors with periodical change of the feed position, was studied by means of numerical simulations. Two advantages of such a reactor configuration, the possibility of exploiting the thermal storage capacity of the catalyst and the optimal temperature profile for exothermic equilibrium-limited reactions, were analyzed. The former feature acting as a regenerative heat exchanger was simulated in the case of the combustion of lean volatile organic compound (VOC) mixtures, with the possibility of multiple stability windows found when rich mixtures are fed. The latter was demonstrated using the methanol synthesis, with the enhancement of the conversion and product selectivity predicted. The influence of the number of the reactors in the network was pointed out. Some results obtained in the reverse-flow reactors were also presented for comparison.

Key words combustion; chemical reactors; methanol; reaction engineering; simulated moving bed; exothermic reversible reactions; volatile organic compound

通讯作者:

Davide FISSORE antonello.barresi@polito.it

作者个人主页: DavideFISSORE; Antonello A.BARRESI; Salvatore VELARDI; MarcoVANNI

扩展功能

本文信息

Supporting info

PDF(233KB)

HTML全文(0KB)

服务与反馈

把本文推荐给朋友

加入我的书架

加入引用管理器

引用本文

Email Alert

文章反馈

浏览反馈信息

相关信息

本刊中 包含“化学反应器”的 相关文章

本文作者相关文章

DavideFISSORE

在PubMed

Antonello ABARRESI

在PubMed

Salvatore VELARDI

在PubMed

MarcoVANNI