

能源和环境工程

双气头多联产系统的Aspen Plus实现及工艺过程优化(II)工艺操作参数分析

郑安庆, 冯杰, 薛冰, 宋云彩, 李文英

太原理工大学煤科学与技术教育部和山西省重点实验室, 山西 太原 030024

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摘要

在所建立的以二甲醚和电力为主要目标产品并副产甲醇的多联产系统流程基础上, 以化工产品产率优化及二氧化碳减排为目的, 以甲醇当量产率、二甲醚产量和CH₄/CO₂转化率作为全流程优化的目标函数, 对包括CH₄/CO₂催化重整单元和二甲醚(甲醇)合成单元在内的两个关键单元流程进行整体优化处理, 同时分析了一步法二甲醚合成反应体系间的协同作用, 得到了重整反应器和合成反应器的优化操作参数和最佳焦炉煤气与气化煤气进料流量比。

关键词

[多联产](#) [气化煤气](#) [焦炉煤气](#) [CH₄/CO₂重整](#) [二甲醚](#) [甲醇](#) [流程模拟](#)

分类号

Modeling and optimization of polygeneration system with coke-oven gas and coal gasified gas by Aspen Plus (II) Determination of optimal operating parameters

ZHENG Anqing, FENG Jie, XUE Bing, SONG Yuncai, LI Wenying

Abstract

Oxy-fuel (alcohol, DME, etc.) is the main chemical product of the coal-based polygeneration system. In this system, 25% (vol) methane in the coke-oven gas is reformed with 23% (vol) CO₂ in the gasified gas, and the syngas at a proper H/C ratio is further changed to oxy-fuel. It is a system with energy-saving and friendly environment. The synthesis of oxy-fuel is the key unit for determining the efficiency and economics for the polygeneration system. In this study, Aspen Plus software was employed to establish an integrated coal-based polygeneration flowsheet. In the simulation, the equivalent yield of methanol and conversion of CH₄ and CO₂ were used as the objective functions for optimizing the operation parameters in the whole polygeneration system. Furthermore, the synergetic effect in the one-step DME synthesis process was investigated.

Key words

[polygeneration system](#) [coal gasified gas](#) [coke-oven gas](#) [CH₄/CO₂ reforming](#) [DME](#) [methanol](#) [process simulation](#)

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