教师个人主页

都健

397

个人信息
Personal Information

教授

博士生导师

硕士生导师

性别：女

毕业院校：大连理工大学

学位：博士

所在单位：化工学院

学科：化学工程

办公地点：大连理工大学西部校区化工实验楼D段305室

联系方式：130-1948-9068（手机）

电子邮箱：dujian@dlut.edu.cn

扫描关注

同专业博导

同专业硕导

个人学术主页

Superstructure-Based Simultaneous Optimization of a Heat Exchanger Network and a Compression-Absorption Cascade Refrigeration System for Heat Recovery

论文类型： 期刊论文

第一作者： Sun, Xiaojing

通讯作者： 刘琳琳,Dong, Yachao,Zhuang, Yu,张磊,都健

发表时间： 2021-01-10

发表刊物： INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH

卷号： 59

期号： 36

页面范围： 16017-16028

ISSN号： 0888-5885

摘要： A heat exchanger network (HEN) plays an important role in the chemical process industry owing to its significant effect in energy recovery. A compression-absorption cascade refrigeration system (CACRS) is a promising technique for energy saving, which is able to utilize the process waste heat to generate cooling energy in different grades. The integrated design and optimization of HEN and CACRS can further improve waste-heat utilization and energy conversion efficiency. However, it is still very challenging to achieve a good integrating performance. To address the issue, an optimization-based method is proposed here that enables the simultaneous determination of the structure of HEN and the operating condition of CACRS. First, an improved superstructure is presented, considering various possibilities in matching, coupling, and system configurations. Based on the superstructure, a mixed-integer non-linear programming model is formulated for optimizing both the network structure and the operating variables, with the objective of minimizing the total annualized cost. Therein, the thermodynamic model of CACRS is included to obtain the optimal CACRS operating condition automatically. Finally, two cases are investigated to illustrate the advantage of the proposed method in improving economic performance and energy conversion efficiency.

上一条：Integrated solvent-process design methodology based on COSMO-SAC and quantum mechanics for TMQ (2,2,4-trimethyl-1,2-H-dihydroquinoline) production

下一条：Multiobjective Optimization of Interplant Heat Exchanger Networks Considering Utility Steam Supply and Various Locations of Interplant Steam Generation/Utilization