

论文与报告

用Lagrangian松弛法解化工批处理调度问题

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摘要

研究基于Lagrangian松弛法的化工批处理过程的调度方法. 建立了化工批处理过程调度问题的一种混合整数规划(MILP)模型, 并通过松弛离散变量和连续变量共存的约束, 将问题分解为一个两层次的优化问题, 其中上层是原问题的对偶问题, 下层由两个子问题构成: 一个与产品批量有关, 另一个确定操作时间表, 分别用线性规划和动态规划方法解这两个子问题. 然后从对偶问题的解构造原问题的可行解. 数值试验结果证明了该方法的有效性.

关键词 [Lagrangian松弛法](#) [化工批处理过程](#) [调度](#) [动态规划](#)

分类号

Scheduling for Batch Chemical Processes Using Lagrangian Relaxation-Based Approach

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Abstract

In this paper, an approach based on Lagrangian Relaxation to schedule batch chemical processes is presented. The scheduling problem is modeled as a compact MILP formulation. The constraints including both discrete and continuous variables are relaxed and the problem is turned into a two-level optimization problem. The high level is the dual of the original problem, and the low level consists of two subproblems, one for batch-sizing, the other for deciding the time table. Linear programming and dynamic programming methods are used to solve the subproblems. A feasible solution is then constructed based on the solution of the dual problem. Computational results are given to demonstrate the effectiveness of the approach.

Key words [Lagrangian relaxation](#) [batch chemical processes](#) [scheduling](#) [dynamic programming](#)

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