

RESEARCH PAPERS

基于瞬时目标函数曲线特性的反应器网络综合

张治山<sup>a</sup>, 赵文<sup>b</sup>, 王艳丽<sup>b</sup>, 周传光<sup>b</sup>, 袁希钢<sup>a</sup>

<sup>a</sup> Chemical Engineering Research Center, Tianjin University, Tianjin 300072, China

<sup>b</sup> Institute of Chemical Engineering, Qingdao University of Science and Technology, Qingdao 266042, China

收稿日期 修回日期 网络版发布日期 接受日期

**摘要** It is believed that whether the instantaneous objective function curves of plug-flow-reactor (PFR) and continuous-stirred-tank-reactor (CSTR) overlap or not, they have a consistent changing trend for complex reactions (steady state, isothermal and constant volume). As a result of the relation of the objective functions (selectivity or yield) to the instantaneous objective functions (instantaneous selectivity or instantaneous reaction rate), the optimal reactor network configuration can be determined according to the changing trend of the instantaneous objective function curves. Further, a recent partition strategy for the reactor network synthesis based on the instantaneous objective function characteristic curves is proposed by extending the attainable region partition strategy from the concentration space to the instantaneous objective function-unreacted fraction of key reactant space. In this paper, the instantaneous objective function is closed to be the instantaneous selectivity and several samples are examined to illustrate the proposed method. The comparison with the previous work indicates it is a very convenient and practical systematic tool of the reactor network synthesis and seems also promising for overcoming the dimension limit of the attainable region partition strategy in the concentration space.

**关键词** [reactor network synthesis](#) [instantaneous objective function](#) [partition](#)

分类号

**DOI:**

### Reactor Network Synthesis Based on Instantaneous Objective Function Characteristic Curves

ZHANG Zhishan<sup>a</sup>, ZHAO Wen<sup>b</sup>, WANG Yanli<sup>b</sup>, ZHOU Chuanguang<sup>b</sup>, YUAN Xigang<sup>a</sup>

<sup>a</sup> Chemical Engineering Research Center, Tianjin University, Tianjin 300072, China

<sup>b</sup> Institute of Chemical Engineering, Qingdao University of Science and Technology, Qingdao 266042, China

Received Revised Online Accepted

**Abstract** It is believed that whether the instantaneous objective function curves of plug-flow-reactor (PFR) and continuous-stirred-tank-reactor (CSTR) overlap or not, they have a consistent changing trend for complex reactions (steady state, isothermal and constant volume). As a result of the relation of the objective functions (selectivity or yield) to the instantaneous objective functions (instantaneous selectivity or instantaneous reaction rate), the optimal reactor network configuration can be determined according to the changing trend of the instantaneous objective function curves. Further, a recent partition strategy for the reactor network synthesis based on the instantaneous objective function characteristic curves is proposed by extending the attainable region partition strategy from the concentration space to the instantaneous objective function-unreacted fraction of key reactant space. In this paper, the instantaneous objective function is closed to be the instantaneous selectivity and several samples are examined to illustrate the proposed method. The comparison with the previous work indicates it is a very convenient and practical systematic tool of the reactor network synthesis and seems also promising for overcoming the dimension limit of the attainable region partition strategy in the concentration space.

**Key words** [reactor network synthesis](#); [instantaneous objective function](#); [partition](#)

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· [王艳丽<sup>b</sup>](#)

· [周传光<sup>b</sup>](#)

· [袁希钢<sup>a</sup>](#)

通讯作者:

张治山

作者个人主页: 张治山<sup>a</sup>; 赵文<sup>b</sup>; 王艳丽<sup>b</sup>; 周传光<sup>b</sup>; 袁希钢<sup>a</sup>