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热集成复杂精馏流程综合的随机最优化方法

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摘要 This paper addresses the application of stochastic optimization approaches to the synthesis
of heatintegrated complex distillation system, which is characterized by large-scale combinatorial feature. Conventionaland complex columns, thermally coupled (linked) side strippers and side rectifiers as well as heat integration betweenthe different columns are simultaneously considered. The problem is formulated as an MINLP (mixed-integernonlinear programming) problem. A simulated annealing algorithm is proposed to deal with the MINLP problemand a shortcut method is applied to evaluate all required design parameters as well as the total cost function. Twoillustrating examples are presented.

关键词 distillation system synthesis complex column heat integration encoding simulated annealing

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Synthesis of Heat Integrated Complex Distillation Systems via Stochastic Optimization Approaches

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Abstract This paper addresses the application of stochastic optimization approaches to the synthesis of heatintegrated complex distillation system, which is characterized by large-scale combinatorial feature. Conventionaland complex columns, thermally coupled (linked) side strippers and side rectifiers as well as heat integration betweenthe different columns are simultaneously considered. The problem is formulated as an MINLP (mixed-integernonlinear programming) problem. A simulated annealing algorithm is proposed to deal with the MINLP problemand a shortcut method is applied to evaluate all required design parameters as well as the total cost function. Twoillustrating examples are presented.

Key words distillation system synthesis; complex column; heat integration; encoding; simulated annealing

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