SYSTEM ENGINEERING

催化重整过程的多目标优化

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摘要   In this article, a multiobjective optimization strategy for an industrial naphtha continuous catalytic reforming process that aims to obtain aromatic products is proposed. The process model is based on a 20-lumped kinetics reaction network and has been proved to be quite effective in terms of industrial application. The primary objectives include maximization of yield of the aromatics and minimization of the yield of heavy aromatics. Four reactor inlet tem-peratures, reaction pressure, and hydrogen-to-oil molar ratio are selected as the decision variables. A genetic algorithm, which is proposed by the authors and named as the neighborhood and archived genetic algorithm (NAGA), is applied to solve this multiobjective optimization problem. The relations between each decision variable and the two objectives are also proposed and used for choosing a suitable solution from the obtained Pareto set.

Multiobjective optimization of the industrial naphtha catalytic reforming process

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Abstract In this article, a multiobjective optimization strategy for an industrial naphtha continuous catalytic reforming process that aims to obtain aromatic products is proposed. The process model is based on a 20-lumped kinetics reaction network and has been proved to be quite effective in terms of industrial application. The primary objectives include maximization of yield of the aromatics and minimization of the yield of heavy aromatics. Four reactor inlet tem-peratures, reaction pressure, and hydrogen-to-oil molar ratio are selected as the decision variables. A genetic algorithm, which is proposed by the authors and named as the neighborhood and archived genetic algorithm (NAGA), is applied to solve this multiobjective optimization problem. The relations between each decision variable and the two objectives are also proposed and used for choosing a suitable solution from the obtained Pareto set.

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