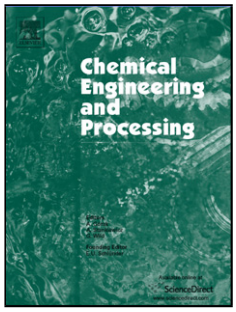

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A modified membrane SMR reactor to produce large-scale syngas: modeling and multi objective optimization

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Highlights

- Conventional SMR reactor is supported by membrane and feeding policy
- The modified SMR is heterogeneously modeled at steady state condition
- The optimal injection rate is calculated based multi-objective model and Pareto frontier
- The single optimal solution is selected from Pareto frontier by decision-making methods

Abstract

In this research, a conventional steam methane reforming (SMR) reactor is modified to enhance CH_4 conversion and decreasing pressure drop considering membrane and distributed feeding policy. In the proposed structure, some feeding points are considered along the membrane reactor and steam is injected to the reactor through feeding nodes. It is demonstrated that a