

عنوان مقاله:

Modeling and constrained optimization of an auto-thermal ammonia synthesis reactor using genetic algorithm

محل انتشار:

سومین کنفرانس ملی و اولین کنفرانس بین المللی پژوهش های کاربردی در علوم شیمی و مهندسی شیمی و سومین کنفرانس ملی و اولین کنفرانس بین المللی پژوهش های کاربردی در زیست شناسی (سال: 1395)

تعداد صفحات اصل مقاله: 7

نویسندگان:

H. R. Khaledian - *Department of Chemical and Petroleum Engineering, Faculty of Science, University of Tab, Tabriz, Iran*

A Tarjomannejad - *Department of Chemical and Petroleum Engineering, Faculty of Science, University of Tab, Tabriz, Iran*

B Mehri KordLar - *Faculty of Science, Urmia University, Urmia, Iran*

خلاصه مقاله:

This paper presents the simulation and optimal design of an ammonia synthesis reactor. The estimation of optimal length of reactor, which gives the maximum profit, is the main objective that is focused on. Different high temperatures with constraints of energy and mass balance of reaction and feed gas temperature and mass flow rate of nitrogen for ammonia production are considered in this study. The optimization procedure is done by genetic algorithm (GA). GA is chosen as an optimization tool simply because of its successful application to many engineering optimization problems. Simulation results with GA are in agreement with the reactor types in industries. It is found that no spikes, noreverse reaction can take place even at high temperature of 800 K and the maximum value of ammonia objective is 5.024×10^6 \$/year at optimal reactor length of 7.4994 m. The successful employment of GA in ammonia reactor design suggests its application for other reactors design and/or modeling.

کلمات کلیدی:

Constrained optimization, Genetic algorithm, Ammonia reactor, Objective function

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/517128>

