

عنوان مقاله:

Numerical simulation of turbulent fluid flow and mass transfer characteristics of hydrogen separation from gas mixture based on industrial hollow-fiber membrane module

محل انتشار:

هشتمین کنفرانس ملی کاربرد CFD در صنایع شیمیایی و نفت (سال: 1396)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Morteza Ardaneh - Faculty of Chemical & Petroleum and Gas Engineering, Semnan University, Semnan, Iran

Mahdieh Abolhasani - Faculty of Chemical & Petroleum and Gas Engineering, Semnan University, Semnan, Iran

Majid Esmaeili - Chemical, Polymeric and Petrochemical Technology Development Research Division, Research Institute of Petroleum Industry (RIPI), P.O.Box: ۱۴۱۱۵-۱۴۳, Tehran, Iran

خلاصه مقاله:

In this study, hydrogen separation process from a gas mixture using industrial polyimide hollow-fiber membrane module was simulated using CFD. Polymeric hollow-fiber membranes are using now in industrial plants for H₂ recovery because of their good factors such as high ratio of surface area to volume, enough H₂ permeability as well as the ability to withstand high feed gas pressure. In order to simulate the momentum transfer in the shell side of membrane module, k- ω and k- ϵ turbulent models were used. The model equations related to retentate side, membrane and permeate side with the appropriate boundary conditions, were solved using COMSOL Multiphysics software version 5.2a. In order to ensure the accuracy of the modeling results, the results of the k- ω and k- ϵ models were compared with industrial result. According to the modeling results, the result of the k- ω model was more accurate than k- ϵ model

کلمات کلیدی:

CFD, Hollow-fiber membrane, Hydrogen separation, Gas mixture, turbulent model

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/658607>

