

عنوان مقاله:

Simulation and optimization of helium-argon separation by thermal diffusion column

محل انتشار:

هفدهمین کنگره ملی مهندسی شیمی ایران (سال: 1400)

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خلاصه مقاله:

In this study, numerical simulations were performed to investigate the separation of helium-argon gas mixture by thermal diffusion column (TDC). Effects of feed rate, cut ratio and hot wire temperature were examined through the simulation of TDC. For minimizing the number of simulations and obtaining the optimum operating conditions, response surface methodology (RSM) was used. Analysis of separative work unit (SWU) values as the target function for helium-argon separation clearly showed that the maximum amount of SWU (۲.۶ kg/year) in TDC was achieved, when hot wire temperature increased as large as technically possible, and the feed flow rate and cut ratio were equal to ۵۵ SCCM (Standard Cubic Centimeters per Minute) and ۰.۴۴, respectively. The comparison of the results with simulation data illustrated that the experimental data were in good agreement with an accuracy of ۹۶.۶%.

کلمات کلیدی:

Thermal diffusion column, Helium/argon separation, Response surface methodology, Simulation and optimization

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