

عنوان مقاله:

Three-component Distillation Columns Sequencing: Including Configurations with Divided-wall Columns

محل انتشار:

فصلنامه علوم و فناوری نفت و گاز، دوره 5، شماره 2 (سال: 1395)

تعداد صفحات اصل مقاله: 18

نویسندگان:

Amirhossein Khalili-Garakani - *PhD Candidate, Computer Aided Process Engineering (CAPE) Lab, School of Chemical Engineering, Iran University of Science and Technology, Tehran, Iran*

Javad Ivakpour - *Assistant Professor, Research, Institute of Petroleum Industry (RIPI), Tehran, Iran*

Norollah Kasiri - *Associate Professor Computer Aided Process Engineering (CAPE) Lab, School of Chemical Engineering, Iran University of Science and Technology, Tehran, Iran*

خلاصه مقاله:

In the present work, the exergy analysis and economic study of 3 different samples of three-component mixtures have been investigated ($ESI > 1$, $ESI \approx 1$, and $ESI < 1$). The feed mixture has been tested under three different compositions (low, equal, and high contents of the intermediate component). A quantitative comparison between simple and complex configurations, considering thermally coupled, thermodynamically equivalent, and divided-wall column (DWC) has been carried out. The results present that the best sequence could be found by TAC or exergy loss rate analysis. Complex sequences have greater exergy losses in comparison to simple sequences. Despite expectations, the Petlyuk sequence only performs well in a few cases and poorly on others. According to the results, as the amount of intermediate component in the feed increases, both TAC and exergy losses of each sequence increase. The results also demonstrated that the occurrence frequency as the best sequence for DWC, thermodynamically equivalent, thermally coupled, and basic sequences are 36%, 28%, 25%, and 11% respectively. According to authors' best knowledge, a quantitative exergy and cost comparison (based on rigorous simulation and optimization) between these configurations have never been carried out all together before.

کلمات کلیدی:

Distillation Sequence, Exergy Analysis, Divided-wall Column, Separation Matrix

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/835391>

