

عنوان مقاله:

Heat integration of the separation process of minimum boiling azeotropic mixtures in order to reduce CO<sub>2</sub> emission and reduce utility consumption

محل انتشار:

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نویسندگان:

Maedeh Koushkian - Department of chemical engineering of Pazhooresh institute, Tehran, Iran

Farideh Bagheri Rafsanjani - Department of chemical engineering of Pazhooresh institute, Tehran, Iran

Alireza Arabi - Department of chemical engineering of Pazhooresh institute, Tehran, Iran

Mehdi Orouji - Department of chemical engineering of Pazhooresh institute, Tehran, Iran

خلاصه مقاله:

Due to the azeotrope between Isopropyl alcohol and water, it is not possible to purify Isopropyl alcohol by normal distillation. In the present article, two processes of Pressure Swing Distillation (PSD) and Extractive Distillation (ED) are used to break azeotrope between Isopropyl alcohol and water. Via drawing a T-xy mixture diagram at different pressures, it is perceived that the azeotrope point of the mixture does not shift with pressure change. As a result, pressure swing distillation is not an appropriate choice for separating this mixture, but extractive distillation with DMSO solvent can bring isopropyl alcohol to 99% purity. The problem is that the energy consumption of the extractive distillation process is high. That's why the feed-splitting method has been used in this article for the Heat integration of the process. To this end, the input feed to the first column was divided into two parts and about 53% of it was preheated with the bottom product of the solvent recovery column. The upper part of the feed also enters the column without changing the temperature.

The results reveal that the projected method can decrease the amount of both hot utility consumption and CO<sub>2</sub> emission by almost 20%.

کلمات کلیدی:

CO<sub>2</sub> emission, Heat integration, Azeotrope, Utility consumption

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