

아세톤 정제를 위한 압력 변환 증류 및 추출 증류의 비교

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The purification of acetone, which has been contaminated with water, has been proven to be challenging and costly. At high operating pressure in process industries, an azeotrope can form from acetone and water which requires high reflux distillation. Pressure swing distillation and extractive distillation are used as alternative processes to break this azeotrope. The solvent effectivity of ethylene glycol and dimethyl sulfoxide as solvent is analyzed through the simulation of extractive distillation. The simulation and analysis of extractive distillation and pressure swing distillation are performed for the separation of the acetone-water azeotrope using PRO/II with PROVISION ver. 9.2. The Non-Random Two Liquid (NRTL) activity model is applied as the thermodynamic model for both distillation processes since it is suitable for polar mixtures like acetone-water. Process optimization is applied to minimize utilities consumption by varying the feed stage location, reflux ratio, and stream flow rate. The steady-state designs of pressure swing distillation and extractive distillation are compared based on minimum heat duty generation and high-purity acetone production.