# Acetic Acid Recovery from Dilute Stream Through Extractor Using Isopropyl Acetate as Entrainer

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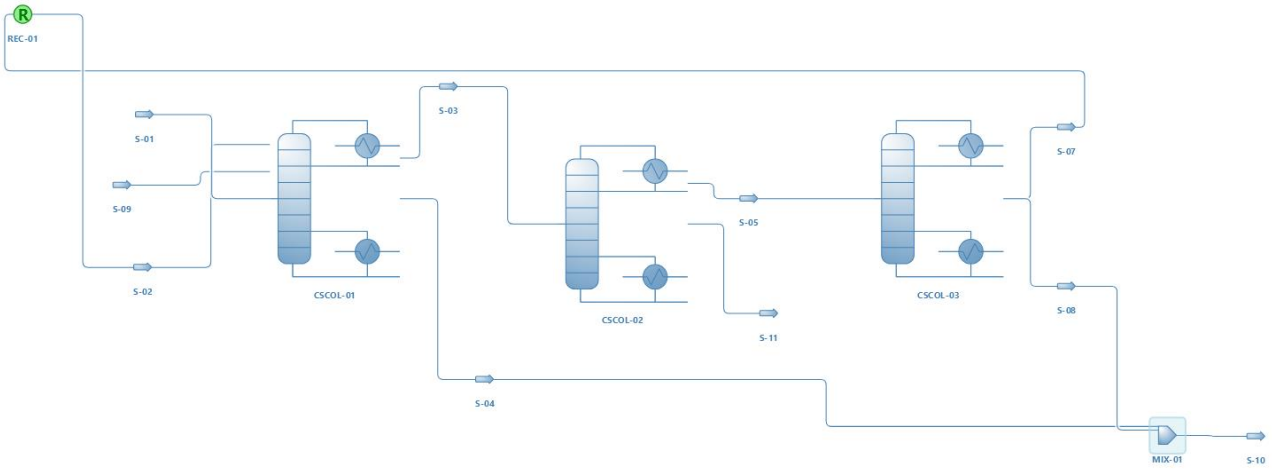
## Background & Description:

Recovery of acetic acid from its dilute stream is of great importance for many chemical and petrochemical industries. To ease the operation different solvents are used to separate the mixture. Ethyl acetate, N-propyl acetate, Isopropyl acetate and N-butyl acetate are some commonly used solvents.
The process comprises of an extractor CSCOL-01, distillation column CSCOL-02 and flash column CSCOL-03. The feed stream S-01 consists of dilute acetic acid which is introduced in the 15 staged chemsep extractor column in counter current with the solvent isopropyl acetate S-02. The feed to solvent ratio is kept as 1:1.1. The top product S-03 of the extractor is sent to 18 staged distillation column for recovery of acetic acid. The feed is introduced at the 9$^{th}$ stage of distillation column and the reflux ratio is kept as 1.9. From the bottom S-11 of distillation column, acetic acid is recovered. The distillate (solvent and water mixture) S-05 is directed into flash column whose top product (solvent) S-07 is recycled to the extractor. The makeup stream S-09 is also added to the extractor column to compensate for the solvent lost. Acid free water is recovered from the bottom of extractor and flash column.

## Flowsheet:



## Results:

| Master Property Table | | | | | | | |
|---|---|---|---|---|---|---|---|
| Object | S-11 | S-07 | S-05 | S-03 | S-02 | S-01 | |
| Temperature | 390.288 | 298.15 | 365.881 | 298.15 | 298.15 | 298.15 | K |
| Molar Flow | 6.06214 | 16.465 | 22.1001 | 28.1622 | 16.465 | 55.2992 | mol/s |
| Density (Mixture) | 940.004 | 886.591 | 2.42192 | 937.402 | 886.591 | 1001.47 | kg/m3 |
| Molar Fraction (Mixture) / Isopropyl acetate | 0.000737378 | 0.85546 | 0.637705 | 0.500604 | 0.85546 | 0 | |
| Molar Fraction (Mixture) / Water | 0.00926262 | 0.113318 | 0.337246 | 0.266636 | 0.113318 | 0.885 | |
| Molar Fraction (Mixture) / Acetic acid | 0.99 | 0.0312228 | 0.0250482 | 0.23276 | 0.0312228 | 0.115 | |