Recovery of succinic acid for bio-based C_4 bifunctional building block production

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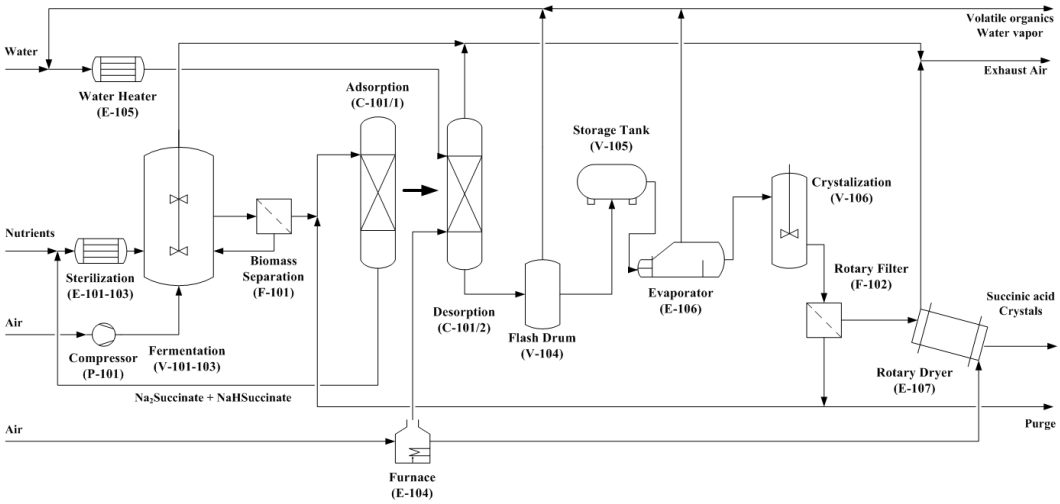
Description

Renewable carbon sources can replace petrochemical sources for C4 building block production. This requires fermentation and product recovery. After an initial study on the potential of gamma-butyrolactone, the focus was on recovery of succinic acid, which can be used in a wide range of products, in particular polyesters.
It was assumed that a low pH fermentation would be developed, and that recovery of succinic acid from a clarified broth would be required. Three different hydrophobic zeolites were screened for succinic acid adsorption. CVB-28014 showed the highest equilibrium loading and was used for adsorption process development.
For desorption, the use of bases was avoided to prevent succinate salt formation. Regeneration with hot water (T > 150 ºC) was selected as the most promising desorption option. In the designed process (see Figure), a pH 4 fermentation is performed with pH control by in-situ succinic acid removal. The downstream costs of this process were modest.



Dissertation

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