

Acrylic acid from sugar cane

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Description

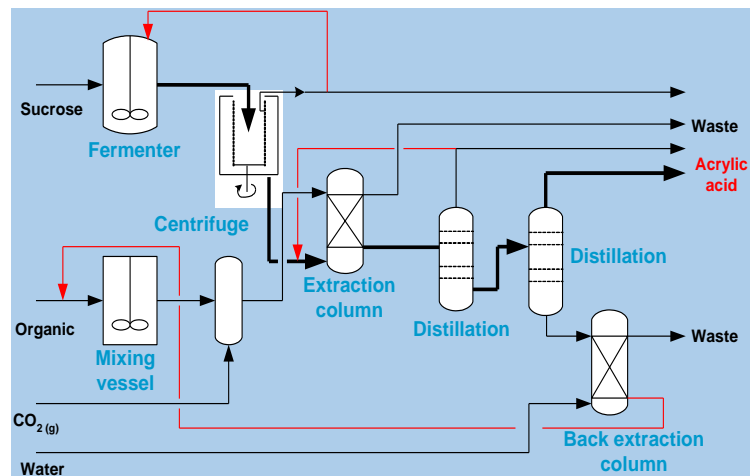
The use of renewable feedstocks such as carbohydrates is a key issue in the development of sustainable large-scale production processes. Several conventional products do already exist such as ethanol (13 million tons per year), glutamate and citric acid (each at 0.8 million tons per year). Nowadays, several global consortia of agro and bulk chemical producers have joined forces to develop 'green' processes for bulk chemicals, essentially targeted at monomers for renewable polymer production (1,3-propanediol, polylactic acid and polyhydroxyalkanoate).

It can be expected that for many other commodity chemicals, fermentation production processes will be developed in the next decades. An industrially relevant chemical that is an interesting target is acrylic acid. Acrylic acid ($\text{CH}_2=\text{CH}-\text{COOH}$) is one of the most important bulk-chemicals, being produced at about 3 million tons per year.

Now it is mainly prepared by a 2-step gas-phase oxidation of

propene via acrolein. Most acrylic acid is esterified before it is polymerized to polyacrylate. Direct fermentation of glucose to acrylic acid may be feasible.

The aim of this study was to design a conceptual process for production of acrylic acid from sugars on the basis of plausible biochemical pathways.



Publications from this work

1. S. Sie, PD Eng thesis, Delft University of Technology, 2004
2. A.J.J. Straathof, S. Sie, T.T. Franco, L.A.M. van der Wielen, Feasibility of acrylic acid production by fermentation, [Appl. Microbiol. Biotechnol.](#) **67** (2005) 727-734.