IsoButanol Platform Rotterdam

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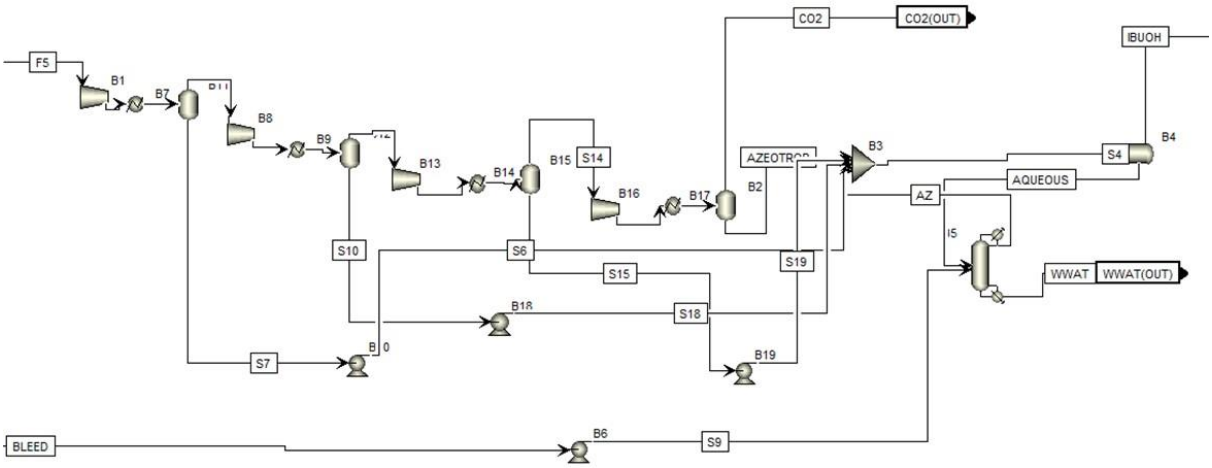
Description

In 2013, the Iso Butanol Platform Rotterdam consortium investigated the feasibility of building a biorefinery in the Rotterdam region in the short term. The focus was on a biomass value chain with isobutanol as the basic molecule.
Isobutanol can be used for the production of sustainable jet fuels, aromatics (paraxylene) and derivatives for additives in diesel fuels. Sugar, syrup (a semi-finished product) and beet pulp are the sustainable raw materials that were studied for this value chain. After pre-processing if necessary, these raw materials can be fermented entirely or in part into isobutanol. Via catalysis, isobutanol can be further converted into three selected products: aromatics such as p-xylene (with hydrogen as by-product) for the plastics industry, jet fuel and glycerol tertiary butyl ether (GTBE) as a diesel additive.
At the end of 2013, the first phase of the study was concluded with elaboration of the business case for the production of isobutanol from sugar and sugar beet pulp. Using the specific knowledge and experience of the companies and knowledge institutes involved, a concrete calculation was made of the production of isobutanol and the subsequent production of jet fuels and aromatics.
The conclusion was reached that although there are no technical hurdles for setting up a value chain for isobutanol, the business cases for 'green' raw materials are not yet economically feasible in the short term. Calculations of all possible applications show that the production price of products based on biomass exceed the fossil equivalent by a factor of 1.8. Specifically, the costs of the raw materials for using sugar and the costs of enzymes or using beet pulp are too high.
However, the environmental gain when using sugar or beet pulp for the products intended has become clear from the calculations. In comparison to the fossil equivalents, a reduction of 60-70% appears possible due to considerably lower energy consumption.



In the second project phase, the Iso-butanol Platform Rotterdam focused on cascading the conversion of lignocellulosic feedstock to products such as iso-butanol and further valorisation to derivates. The Organosolv extraction/biorefining process was used to separate lignin and other useful materials from the biomass. The lignin was converted into high quality chemicals. The (hemi)cellulosic sugars was fermented into iso-butanol. Via catalyses iso-butanol was further converted to aromatics such as p-xylene, jetfuel, glycerol and GTBE as diesel additive.

https://be-basic.org/wp-content/uploads/2020/09/Public_summary_Isobutanol_Platform_Rotterdam_april_2016_01.pdf