

ADVANCED PURIFICATION TECHNOLOGIES FOR YOUR BIO-BASED CHEMICALS

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Biomass can be converted into a very broad range of products. Traditionally, parts of the plant were used as animal feed, as source of carbohydrates for human nutrition, etc. A new usage is currently being developed: producing industrial chemicals using the whole plant: bio-based chemicals. Targeted molecules are main intermediates of the petro-based chemistry, also named “platform molecules” or “building blocks”, such as 1,3 PDO or succinic acid.

To enter the chemical value chain, and to allow direct substitution as drop-in chemicals, bio-based building blocks must fit with current specifications applied to petro-based chemicals. Purity is therefore an essential quality parameter of bio-based chemicals.

Biomass is made of cellulose, hemicellulose and lignin, but it is extremely diverse: biomass is a generic term covering a huge number of species, with a huge variety of compositions. Cellulose / Hemicellulose ratio may vary; hemicelluloses can be made of C5 or C6 sugars, lignin can be made of different sizes of polymers, etc.

So the main challenge facing bio-based chemicals producers is: how to transform in a cost-effective manner such a diverse raw material made of complex molecules, into a standardized, pure biochemical?

Novasep’s advanced purification technologies can help to fill this gap !

Novasep is specialist in solving purification challenges, from process development to industrial installations, and from laboratory equipment to turnkey plants. For this, Novasep develops optimised combination of separation technologies, selectively chosen among ion-exchange, chromatography, electro dialysis, and membrane filtration, in order to meet the purification targets and overall environmental constraints.

Success stories that we may develop in the presentation:

- Organic acids purification by Continuous Ion Exchange (succinic acid...)
- Cellulosic sugars separation and purification by industrial SSMB chromatography: C6 and C5 sugars, separation of xylose and arabinose

- Fermentation broth clarification with ceramic membrane filtration

These examples will show how Novasep integrates and scales up the purification operations with the upstream process, to maximize efficiency, minimize waste and improve the overall process economics.