

Maximizing the Biomass



Fermentation equipment.
(Iogen Corporation)

The development of biotechnologies can significantly affect the processing and profit-making capacity of industrial waste.

To deal with wood waste produced mainly by the forestry and agricultural industries, Stake Technology Ltd. of Norval, Ontario, has developed a steam cracking process for biomass transformation. This process, called Staketech, uses steam cracking to decompose waste into its three principal components: cellulose, hemicellulose and lignin. With the Staketech process, Stake has become a world leader in the conversion of lignocellulose material. However, this is only the first stage in the transformation of biomass components into a whole range of valuable products, and it is at this point that biotechnology will play a role.

Micro-organisms can, for example, metabolize the sugars contained in hemicellulose and

thereby obtain a protein-rich product that can be used as animal feed. The chemical and food industries could also take advantage of hemicellulose byproducts, the former with the production of furfural, a solvent; and the latter with the production of xylitol, a byproduct of wood alcohol (xylose) that has an excellent sweetening power and can be found mainly in sugar-free chewing gums.

In regard to xylitol, Iogen Corporation of Ottawa, Ontario, has developed a production technique that can reduce costs significantly. When produced conventionally, xylitol is 500 per cent more expensive than when it is obtained from sugar alcohol and sorbitol.

Cellulose can be hydrolysed by enzymes in the preparation of fermentable sugars that can be used to produce ethanol or prepare complex chemical products (acetone-butanol, polyols, etc.).

The lignin obtained with the Stake process is not chemically modified. Thus, it could be used in the preparation of adhesives for the forest products industry and in a wide variety of other products.

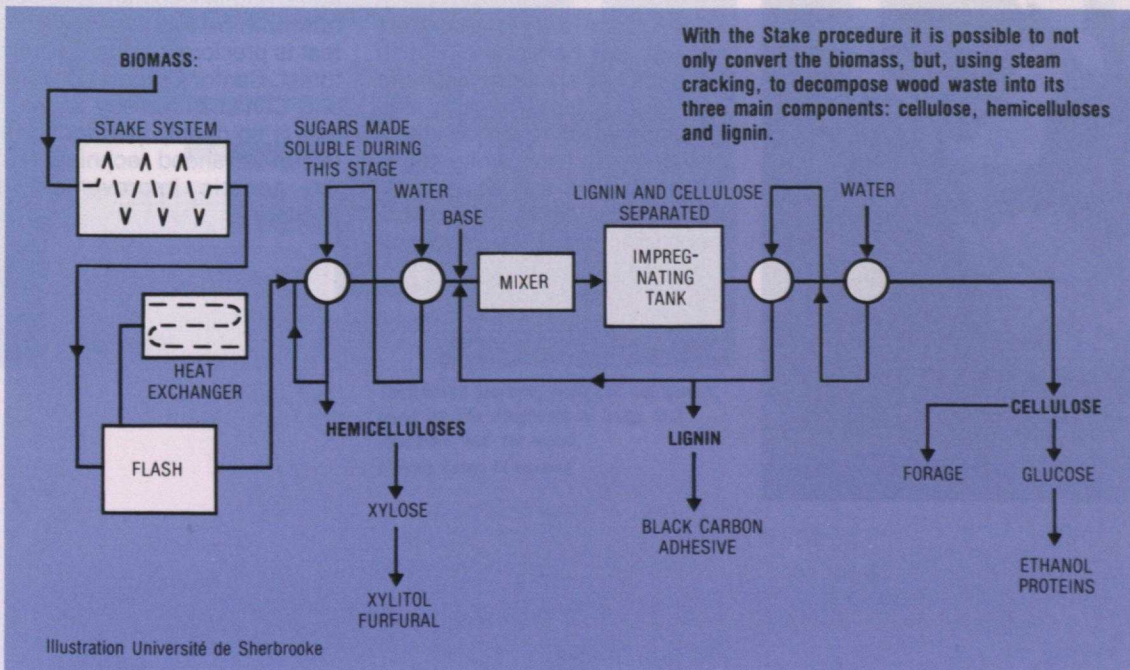


Illustration Université de Sherbrooke

Biomass conversion process.
(Stake Technology Ltd.)