

For Effective Inversion of Sugar Syrup

Praj's Bioproducts division combines the knowledge of Biotechnology, Microbiology, Engineering, and operations to deliver products that add value to the Sugar and Ethanol industry. Apart from specific products, the division also provides value added services like:

- Technical Audits of processes
- Analytical services of various streams
- Product dosing optimization
- Microbiological services

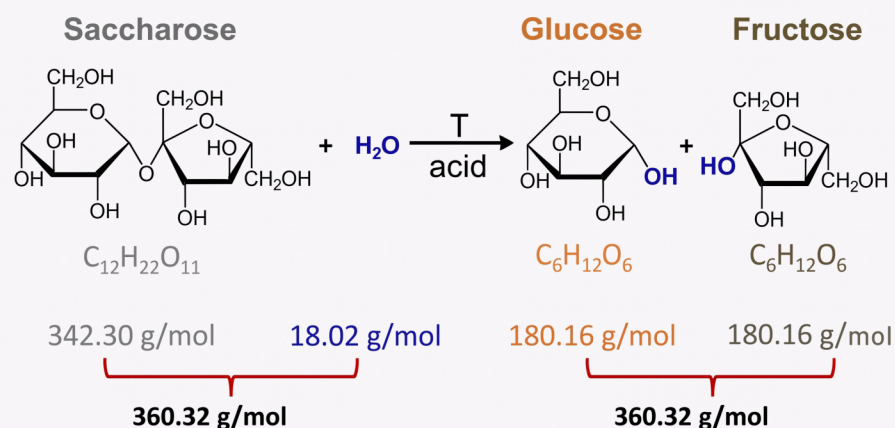
For effective utilization of the alternate feedstocks, Praj has launched an innovative solution to process sugarcane juice into new sustainable feedstock BIOSYRUP[®] for round the year ethanol production.

Praj's first of its' kind patented technology for producing BIOSYRUP[®] has been successfully demonstrated and implemented to store the syrup for a year without sugar loss. The technology has been validated and certified by India's premier sugar research institution.

BIOINVERT- A special blend of Thermostable enzymes- is a practical solution for effective inversion of sugar cane syrup.

Key Action of Bioinvert:

- Bioinvert is an invertase enzyme that catalyzes the hydrolysis of sucrose into fructose and glucose. The resulting mixture of fructose and glucose is called inverted sugar syrup.
- Sucrose is a disaccharide of alpha-D-glucose molecule and a beta-D-fructose molecule linked by an alpha-1,4-glycosidic bond. When this bond is cleaved in a hydrolysis reaction, an equimolar mixture of glucose and fructose is generated.



Inversion of sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) is a first order reaction and is studied by measuring angle of rotation at different intervals of time

$$\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{H}_2\text{O} \xrightarrow{\text{H}^+} \text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_6\text{H}_{12}\text{O}_6$$

Sucrose + H_2O $\xrightarrow{\text{H}^+}$ Glucose + Fructose

Dose & Application:

- A recommended minimum dose of BIOINVERT is @10.0 ppm. Based on the recommended dose, calculate the required quantity of enzyme for dosing
- Required quantity of Bioinvert is dissolved / mixed in clean, cool, and fresh process water (do not use any spent water / condensate / treated water from plant, Refer to Table 1 above for process water specifications) and added in one shot to the Syrup in reaction tank.
- The optimal dose of BIOINVERT depends upon process conditions like process temperature and pH. Further, the dose may depend upon syrup storage condition.

Consult Praj Technical Expert for detail guidelines for Application.

Packing:

Bioinvert is packed in 1 Kg pouches and further in to 25 Kg Cartons / HDPE carboys.

Shelf Life:

Store away from direct heat and sunlight. Preferably below 25 Deg C. When stored under recommended conditions in original container, the product is stable for one year.



Advantages of Bioinvert:

- Quick inversion of Sucrose to glucose and fructose.
- Produces equimolar concentrations of glucose and fructose.
- Unlike traditional acid inversion the enzymatic inversion does not cause charring of sugar.
- The invert sugar formed using Bioinvert is brighter, cleaner.

Bioinvert Typical Properties:

Description	Off white to cream colour powder
Enzyme Activity	Not less than 200,000 SU/g
Moisture	<5%
Salmonella, E. coli	Absent

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WARRANTY OF MERCHANTABILITY OR FITNESS OF THE GOODS for purposes other than specified by the seller. No such warranties shall be implied by law and no agent of seller is authorized to alter this warranty in any way except in writing with a specific reference to this warranty. The exclusive and maximum possible remedy against the seller shall be a claim for damages not to exceed the purchase price of the product, without regard to whether such a claim is based upon breach of contract/ warranty. Any dispute, controversy or claim arising out of this contract or breach thereof, shall be settled by arbitration in accordance with the provision of Indian arbitration and reconciliation act 1996 and shall be governed by Indian laws and shall have exclusive jurisdiction of Pune Maharashtra Court.