

## Product Information

### Sucrose

Product Number **S 5391**  
Store at Room Temperature

#### Product Description

Molecular Formula:  $C_{12}H_{22}O_{11}$   
Molecular Weight: 342.3  
CAS Number: 57-50-1

This product is a disaccharide composed of glucose and fructose, which is used for a variety of applications.<sup>1,2</sup> It is isolated from cane sugar; it is not synthetic. This product is tested for use in plant cell culture applications at 15 mg/ml.

Sucrose yields one equivalent of glucose and 1 equivalent of fructose on acid hydrolysis. This 1:1 mixture of glucose and fructose is referred to as invert sugar, since the sign of optical rotation changes (inverts) during the hydrolysis from sucrose ( $[\alpha]_D = +66.5$ ) to a glucose-fructose mixture ( $[\alpha]_D = -22.0$ ).<sup>3</sup> Certain insects, particularly honeybees, have enzymes called invertases that catalyze the hydrolysis of sucrose to a glucose-fructose mixture. Unlike most other disaccharides, sucrose is not a reducing sugar and does not exhibit mutarotation. These facts imply that sucrose has no hemiacetal linkages and that glucose and fructose must both be glycosides. This can happen only if the two sugars are joined by a glycoside link between C1 of glucose and C2 of fructose. In addition, sucrose does not reduce Fehling's solution (an indicator of aldehydes) and it will not form an osazone like fructose and glucose will. Sucrose is hygroscopic and can absorb up to 1% moisture by weight. Heating the powder to 90 °C will remove this moisture.

Sucrose is used in the plastics and cellulose industry, in rigid polyurethane foams, manufacturing of ink and of transparent soaps. It is also used as the starting material in the fermentative production of ethanol, butanol, glycerol, citric acid, and levulinic acids.

This product can also be used to prepare density gradients for cell/organelle separation.<sup>1,2</sup> The refractive index of the solution will be directly related to the density.<sup>2</sup> In addition, sucrose can be used as a supplement in plant, insect, and bacterial culture media. It is fermentable in bacterial culture systems, except at high concentrations. It can also be used in various enzymatic assays.

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

This product is soluble in water (500 mg/ml).

#### Storage/Stability

Solutions can be autoclaved for 15-20 minutes at a maximum of 121 °C. There will be some hydrolysis to glucose and fructose, depending in part on how rapidly the autoclave comes to the required temperature and pressure. Care must be taken to prevent solutions from caramelizing.

#### References

1. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), pp. 545-546.
2. Centrifugation, a Practical Approach, 2nd ed., Rickwood, D., ed., IRL Press (Oxford, UK: 1984) Appendix IV.
3. The Merck Index, 12th edition, #9051.

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