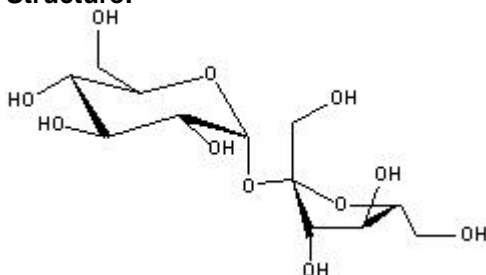


TECHNICAL INFORMATION

Catalog Number: 152584, 190271, 194018, 194747, 821713, 821721, 902978, 904713

Sucrose

Structure:



Molecular Formula: C₁₂H₂₂O₁₁

Molecular Weight: 342.30

CAS # : 57-50-1

Synonyms: Beet sugar; Cane sugar; b-D-Fructofuranosyl-a-D-glucopyranoside; D-(+)-Saccharose; Sugar; a-D-Glucopyranosyl-b-D-fructofuranoside

Physical Appearance: White crystalline powder

Solubility: Soluble in water (1 g/0.5 ml @ 25°C; 1 g/0.2 ml boiling water), ethanol (1 g/170 ml) or methanol (1 g/100 ml); moderately soluble in glycerol or pyridine.¹

Note:¹ Sucrose is hydrolyzed to glucose and fructose by dilute acids and by invertase, a yeast enzyme. Upon hydrolysis the optical rotation falls and is negative when the hydrolysis is complete. The mixture of glucose and fructose is known as "invert sugar."

Description: A simple carbohydrate. Its use in density gradients has been described.^{4,8,15,17}

Physiological Impact of Dietary Carbohydrate Source: Diets which are high in simple carbohydrates, e.g., sucrose, can cause fatty liver^{2,18} and Hepatic lipid levels can increase up to 6 fold over normal controls.² Serum triglycerides are also increased. Substitution of corn starch for sucrose can reverse these effects.¹⁴ Intestinal flora are also affected by the simple vs. complex carbohydrate ratio in the diet.^{5,19,20}

The toxicity of some drugs is markedly affected by the simple/complex carbohydrate ratio of the diets used in the study.^{6,9,12,13} Intestinal secretion of lipids and lipoproteins is also effected by the simple/complex ratio of the diet.¹⁶ For these reasons, Bacon, et al.², concludes that "The AIN-76A Diet is not suitable for toxicological studies which depend on normal hepatocellular structure." In a few cases, such as in riboflavin deficient diets, sucrose is preferred over corn starch due to its interactions in the gut to decrease intestinal synthesis of riboflavin, whereas corn starch has the opposite effect.³

Availability:

Catalog Number	Description	Size
190271	Sucrose, suitable for most density gradient studies with RNA. Typically forms a clear, colorless solution at a concentration of 5 g per 10 ml water.	500 g 1 kg 5 kg
194747	Sucrose, cell culture reagent	500 g 1 kg 5 kg
902978	Sucrose, this is a slightly less pure sucrose than 190271. It may not reduce Fehling's solution, and is suitable for most routine applications	1 lb 5 lb 25 lb 100 lb
152584	Sucrose, ACS Reagent Grade	500 g 1 kg
821713 821721	Sucrose, Ultra Pure, RNase free	1 kg 5 kg
194018	Sucrose, molecular biology reagent, purity not less than 99%	500 g 1 kg 5 kg

804713	Sucrose, FCC Grade	5 lb 25 lb 100 lb
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References:

- *Merck Index*, **12th Ed.**, No. 9051.
- Bacon, B.R., et al., "Hepatic steatosis in rats fed diets with varying concentrations of sucrose." *Fundamental and Applied Toxicology*, **v. 4**, 819-826 (1984).
- Bessey, et al., "The riboflavin economy of the rat." *J. Nutr.*, **v. 64**, 185 (1958).
- Beynen, A.C., *Z. Anal. Chem. Fres.*, **v. 307**, 413 (1981).
- Bounous, G. and Devroede, G., "Effects of an elemental diet on human fecal flora." *Gastroenterology*, **v. 66**, 210 (1974).
- Chism, J.P., Rickert, D.E., Hamm, T.E. Jr. and Goldstein, R.S., "The effect of diet on the excretion and toxicity of nitrobenzene." *Federation Proceedings*, **v. 43**, 360 (1984).
- Cull, M. and McHenry, C.S., *Methods Enzymol.*, **v. 182**, 147-153 (1990).
- Davis, P.B. and Pearson, C.K., *Anal. Biochem.*, **v. 91**, 343 (1978).
- deBethizy, J.D., Sherrill, M., Rickert, D.E. and Hamm, T.E. Jr., "Influence of diet on hepatic macromolecular binding of 2,6-dinitrotoluene (DNT) in rats." *Toxicologist*, **v. 3**, 81 (1983).
- Fialka, I., et al., *Electrophoresis*, **v. 18**, 2582-2590 (1997).
- Gerner, C., et al., *J. Cell. Biochem.*, **v. 71**, 363-374 (1998).
- Goldstein, R.S., Chism, J.P. and Hamm, T.E. Jr., "Influence of diet on intestinal microfloral metabolism and toxicity of nitrobenzene." *Toxicologist*, **v. 4**, 143 (1984).
- Goldsworthy, T.L., Richert, D.E., Hamm, T.E. Jr. and Popp, J.A., "Effect of diet on 2,6-dinitrotoluene." *Hepatocar Canada* (August, 1985).
- Hamm, T.E., et al., "Unsuitability of the AIN-76A diet for male F-344 and CD rats and improvement by substituting starch for sucrose." *Laboratory Animal Science*, **v. 32:4**, 414, abstract 12 (1988).
- Hughes, B.G., *Biochem. Physiol. Pflanz.*, **v. 172**, 223 (1978).
- Keim, L.N. and Marlett, J.A., "Intestinal secretion of lipids and lipoproteins during carbohydrate absorption in the rat." *J. Nutr.*, **v. 110**, 1354-1364 (1980).
- Mechler, B.M., *Meths. Enzymol.*, **v. 152**, 241 (1987).
- Medinsky, M.A., et al., "Development of hepatic lesions in male fischer-344 rats fed AIN-76A purified diet." *Toxicology and Applied Pharmacology*, **v. 62**, 111-120 (1984).
- Sherrill, J.M., deBethizy, J.D., and Hamm, T.E., "Dietary effects on the gastrointestinal microflora in the Fischer 334 Rat," presented at the *American Society of Microbiology Meeting*, St. Louis, Missouri (1984).
- Winitz, M., et al., "Studies in metabolic nutrition employing chemically defined diets. II. Effects on gut microflora population." *Am. J. Clin. Nutr.*, **v. 23**, 546 (1970).