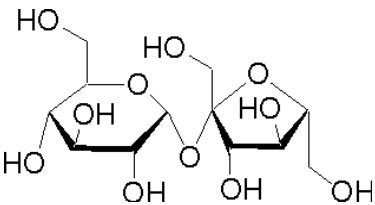
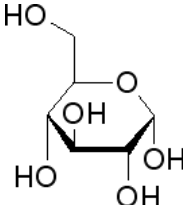
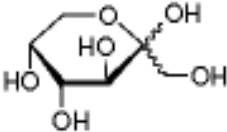


Supporting Information (Part I)

Material information for sucrose, glucose, and fructose obtained from the Sigma-Aldrich Co. (St. Louis, MO) and analyzed by the authors of this study.

	Sucrose (cane sugar)	Glucose (D-(+)-glucose)	Fructose (D-(-)-fructose)
			
Synonyms	α -D-Glc-(1 \rightarrow 2)- β -D-Fru, D(+)-Saccharose, Sugar, β -D-Fructofuranosyl- α -D-glucopyranoside, α -D-Glucopyranosyl β -D-fructofuranoside	Dextrose	D-Levulose, fruit sugar
Empirical formula	C ₁₂ H ₂₂ O ₁₁	C ₆ H ₁₂ O ₆	C ₆ H ₁₂ O ₆
Molecular weight	342.3	180.16	180.16
Grade	For molecular biology	SigmaUltra	SigmaUltra
Assay	$\geq 99.5\%$ (GC)	99.5% (GC)	
Melting point	185-187°C (lit.)	150-152°C (lit.)	119-122°C (lit.)
Absorbance	A _{50%} /260 < 0.15 A _{50%} /280 < 0.15	A _{1M} /260, H ₂ O < 0.02 A _{1M} /280, H ₂ O < 0.02	
Solubility		H ₂ O: 1M at 20°C, clear, colorless	H ₂ O: 1M at 20°C, clear, colorless
Ignition residue	<0.05% ¹	< 0.1% (as SO ₄)	< 0.1%
Loss		< 0.1% loss on drying	
Total impurities	Free glucose with < 0.05% detection limit ²	Insoluble matter, passes filter test	< 0.0005% Phosphorus (P) < 0.05% Glucose (enzymatic) < 0.1% Insoluble matter

¹Determined using sulfated ash method by Tale & Lyle, Decatur, IL ²The sucrose was assayed as a Trimethylsilyl (TMS) derivative by gas liquid chromatography (GLC). Value provided via personal communication by the Technical Department at Sigma-Aldrich Co. (St. Louis, MO.)

(Cont.)

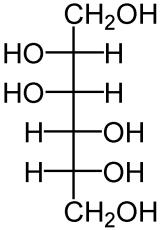
	Sucrose (cane sugar)	Glucose (D-(+)-glucose)	Fructose (D-(-)-fructose)
Anion traces ³	Chloride (Cl ⁻): 4 ppm Nitrate (NO ₃ ⁻): 1 ppm Sulfate (SO ₄ ²⁻): 3 ppm Phosphate (PO ₄ ³⁻): < 1 ppm	Chloride (Cl ⁻): < 50 ppm Sulfate (SO ₄ ²⁻): < 50 ppm	Chloride (Cl ⁻): < 500 ppm Sulfate (SO ₄ ²⁻): < 500 ppm
Cation traces ⁴	Ca: 0.25 ppm Fe: None found K: 8.34 ppm Mg: 0.20 ppm Na: 0.81 ppm P: 0.82 ppm Pb: < 5 ppm ⁵ S: 10.91 ppm Si: 0.74 ppm Zn: 0.33 ppm	Al: < 5 ppm As: < 1 ppm Ba: < 5 ppm Bi: < 5 ppm Ca: < 10 ppm Cd: < 5 ppm Co: < 5 ppm Cr: < 5 ppm Cu: < 5 ppm Fe: < 5 ppm	K: < 50 ppm Li: < 5 ppm Mg: < 5 ppm Mn: < 5 ppm Mo: < 5 ppm Na: < 50 ppm Ni: < 5 ppm Pb: < 5 ppm Sr: < 5 ppm Zn: < 5 ppm

³Anion traces for sucrose were analyzed using Ion Chromatography by Tate & Lyle, Decatur, IL. ⁴Cation traces for sucrose were analyzed using Inductively Coupled Plasma Optical Emission Spectrometry by Microanalysis Laboratory at the University of Illinois at Urbana-Champaign, IL.

⁵Heavy metals (as Pb) reported by Sigma-Aldrich was < 5 ppm.

Supporting Information

Material information for mannitol obtained from the Sigma-Aldrich Co.

D-Mannitol		
		
Synonyms	Mannite	
Empirical formula	C ₆ H ₁₄ O ₆	
Molecular weight	182.17	
Grade	SigmaUltra	
Assay	≥ 99.9%	
Melting point	167-170°C (lit.)	
Solubility	H ₂ O: 1M at 20°C, clear, colorless	
Ignition residue	< 0.01%	
Total impurities	< 0.0005% Phosphorus (P) < 0.01% Insoluble matter	
Anion traces	Chloride (Cl): < 50 ppm Sulfate (SO ₄ ²⁻): < 50 ppm	
Cation traces	Al: < 5 ppm	Mg: < 5 ppm
	Ca: < 5 ppm	NH ₄ ⁺ : < 5 ppm
	Cu: < 5 ppm	Na: < 50 ppm
	Fe: < 5 ppm	Pb: < 10 ppm
	K: < 50 ppm	Zn: < 5 ppm