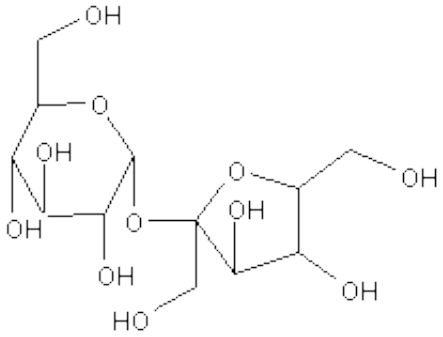
Sucrose

- **Formula:** $C_{12}H_{22}O_{11}$
- **Molecular weight:** 342.30
- **IUPAC International Chemical Identifer:**
  - `InChI=1/C12H22O11/c13-1-4-6(16)8(18)9(19)11(21-4)23-12(3-15)10(20)7(17)5(2-14)22-12/h4-11,13-20H,1-3H2`
  - Download the identifier in a file.
- **CAS Registry Number:** 57-50-1
- **Chemical structure:**



This structure is also available as a 2d Mol file .

- **Other names:** α-D-Glucopyranoside, β-D-fructofuranosyl; β-D-Fructofuranosyl α-D-glucopyranoside; Amerfond; Beet sugar; Cane sugar; Confectioner's sugar; D-Sucrose; Granulated sugar; Microse; Rock candy; Saccharose; Saccharum; Sugar; White sugar; D-(+)-Sucrose; D-(+)-Saccharose; D-(+)-Saccharose bp ph.eur; α-D-Glucopyranosyl β-D-fructofuranoside; β-D-Fructofuranoside, α-D-glucopyranosyl; (α-D-Glucosido)-β-D-fructofuranoside; Fructofuranoside, α-D-glucopyranosyl, β-D; Glucopyranoside, β-D-fructofuranosyl, α-D; NCI-C56597; White sugar Enovit M; Sugartab; Table sugar; Hex-2-ulofuranosyl hexopyranoside
- **Information on this page:**
  - Condensed phase thermochemistry data
  - Reaction thermochemistry data
  - References
  - Notes / Error Report
- **Other data available:**
  - Phase change data
  - IR Spectrum
  - THz IR Spectrum
  - Mass Spectrum
- **Options:**
  - Switch to calorie-based units

Condensed phase thermochemistry data

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Data compiled as indicated in comments:
ALS - H.Y. Afeefy, J.F. Liebman, and S.E. Stein
DH - E.S. Domalski and E.D. Hearing

Quantity	Value	Units	Method	Reference	Comment
$\Delta_f H°_{solid}$	-2221.2	kJ/mol	Ccb	Clarke and Stegeman, 1939	*ALS*
Quantity	**Value**	**Units**	**Method**	**Reference**	**Comment**
$\Delta_c H°_{solid}$	-5643.4 ± 1.8	kJ/mol	Ccb	Ponomarev and Migarskaya, 1960	Reanalyzed by Cox and Pilcher, 1970, Original value = -5645.9 ± 1.8 kJ/mol; Corresponding $\Delta_f H°_{solid}$ = -2222.9 kJ/mol (simple calculation by NIST; no Washburn corrections); *ALS*
$\Delta_c H°_{solid}$	-5644.17	kJ/mol	Ccb	Clarke and Stegeman, 1939	Corresponding $\Delta_f H°_{solid}$ = -2222.1 kJ/mol (simple calculation by NIST; no Washburn corrections); *ALS*
$\Delta_c H°_{solid}$	-5637.4 ± 1.7	kJ/mol	Ccb	Huffman and Ellis, 1935	Reanalyzed by Cox and Pilcher, 1970, Original value = -5642.21 kJ/mol; Corresponding $\Delta_f H°_{solid}$ = -2228.9 kJ/mol (simple calculation by NIST; no Washburn corrections); *ALS*
$\Delta_c H°_{solid}$	-5647.79	kJ/mol	Ccb	Karrer and Floroni, 1923	See 22KAR; Corresponding $\Delta_f H°_{solid}$ = -2218.46 kJ/mol (simple calculation by NIST; no Washburn corrections); *ALS*
$\Delta_c H°_{solid}$	-5664.38 ± 0.69	kJ/mol	Ccb	Wrede, 1911	See Fischer and Wrede, 1904; Corresponding $\Delta_f H°_{solid}$ = -2201.87 kJ/mol (simple calculation by NIST; no Washburn corrections); *ALS*
Quantity	**Value**	**Units**	**Method**	**Reference**	**Comment**
$S°_{solid,1 bar}$	392.40	J/mol*K	N/A	Putnam and Boerio-Goates, 1993	*DH*
$S°_{solid,1 bar}$	360.2	J/mol*K	N/A	Parks, Huffman, et al., 1933	Extrapolation below 90 K, 113.2 J/mol*K.; *DH*

Constant pressure heat capacity of solid

$C_{p,solid}$ (J/mol*K)	Temperature (K)	Reference	Comment
424.30	298.15	Putnam and Boerio-Goates, 1993	T = 10 to 340 K.; *DH*
		Finegold, Franks, et al.	

430.	300.	Flnegold, Franks, et al., 1989	T(glass) = 330 K.; *DH*
425.5	298.15	Anderson, Higbie, et al., 1950	T = 298 to 363 K.; *DH*
422.50	297.0	Parks, Huffman, et al., 1933	T = 94 to 297 K. Value is unsmoothed experimental datum.; *DH*

Reaction thermochemistry data

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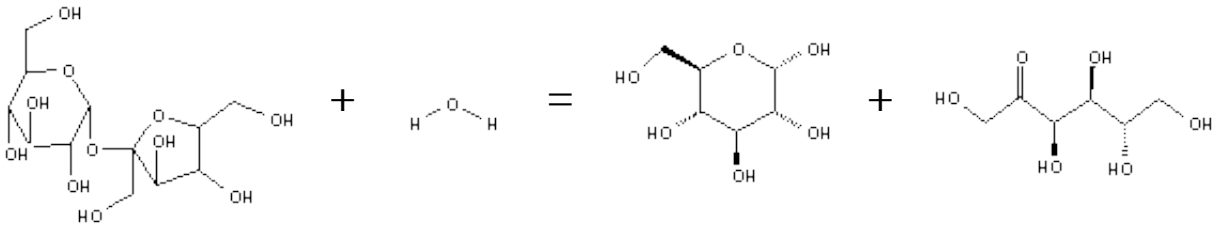
Data compiled by: H.Y. Afeefy, J.F. Liebman, and S.E. Stein

Note: Please consider using the reaction search for this species. This page allows searching of all reactions involving this species. A general reaction search form is also available. Future versions of this site may rely on reaction search pages in place of the enumerated reaction displays seen below.

Individual Reactions



By formula: $C_{12}H_{22}O_{11}$ + H_2O = $C_6H_{12}O_6$ + $C_6H_{12}O_6$

Quantity	Value	Units	Method	Reference	Comment
$\Delta_r H°$	-14.93 ± 0.16	kJ/mol	Eqk	Goldberg, Tewari, et al., 1989	liquid phase; solvent: Aqueous

References

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