

tin

Inchi:	InChI=1S/Sn
InchiKey:	ATJFFYVFTNAWJD-UHFFFAOYSA-N
Formula:	Sn
SMILES:	[Sn]
Mol. weight [g/mol]:	118.71
CAS:	7440-31-5

Physical Properties

Property code	Value	Unit	Source
ea	1.11	eV	NIST Webbook
ea	1.11 ± 0.02	eV	NIST Webbook
ea	1.15 ± 0.15	eV	NIST Webbook
ea	1.11 ± 0.00	eV	NIST Webbook
hf	301.20 ± 1.50	kJ/mol	NIST Webbook
hfus	7.13	kJ/mol	Odd even effect in melting properties of 12 alkane-a,x-diamides
ie	7.34 ± 0.00	eV	NIST Webbook
ie	7.87	eV	NIST Webbook
ie	7.40 ± 0.30	eV	NIST Webbook
ie	7.34	eV	NIST Webbook
ie	7.34	eV	NIST Webbook
ie	7.30 ± 0.20	eV	NIST Webbook
ie	7.28 ± 0.07	eV	NIST Webbook
ie	7.34	eV	NIST Webbook
sgb	168.49 ± 0.00	J/mol×K	NIST Webbook
ss	51.18 ± 0.08	J/mol×K	NIST Webbook
tf	504.87 ± 0.30	K	NIST Webbook
tf	505.11 ± 0.00	K	NIST Webbook
tf	505.15 ± 1.00	K	NIST Webbook

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
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dvisc	0.0012530	Paxs	873.00	A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Liquid Metals and Alloys
dvisc	0.0011420	Paxs	973.00	A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Liquid Metals and Alloys
dvisc	0.0010870	Paxs	1073.00	A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Liquid Metals and Alloys
speedsl	2470.00	m/s	608.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2408.00	m/s	804.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2416.00	m/s	814.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2379.00	m/s	919.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2366.00	m/s	1012.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2332.00	m/s	1025.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV

speedsl	2306.00	m/s	1218.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2234.00	m/s	1453.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
speedsl	2242.00	m/s	1463.00	Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV
tcondl	33.00	W/mxK	603.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements
tcondl	32.00	W/mxK	571.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements
tcondl	30.70	W/mxK	534.30	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements
tcondl	33.50	W/mxK	630.00	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements
tcondl	34.30	W/mxK	678.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements

tcondl	34.50	W/mxK	703.00	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements
tcondl	35.00	W/mxK	730.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements
tcondl	27.30	W/mxK	523.10	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	28.00	W/mxK	549.20	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	28.60	W/mxK	580.00	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	29.10	W/mxK	603.70	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts

tcondl	30.00	W/mxK	634.90	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	30.60	W/mxK	657.00	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	31.40	W/mxK	683.80	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	31.90	W/mxK	707.60	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts
tcondl	32.50	W/mxK	733.20	Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts

Sources

The measurement of thermal conductivity variation with temperature in 20% Sn + 80% Au-Cu-Sn alloys determined from thermophysical properties of Ga-Zn eutectic alloys with Sn additions:	https://www.doi.org/10.1016/j.tca.2012.12.012
A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Vapourisation Thermodynamics of the ZnO-SnO₂ system:	https://www.doi.org/10.1016/j.fluid.2018.07.008
Integral enthalpy of mixing of the liquid ternary Au Cu Sn system:	https://www.doi.org/10.1007/s10765-016-2104-7
Enthalpy of mixing of liquid systems for lead free soldering: The Ni-Sb-Sn System:	https://www.doi.org/10.1016/j.tca.2013.11.010
Enthalpies of Mixing of Liquid In-Sn and In-Sn-Zn Alloys:	https://www.doi.org/10.1016/j.tca.2008.01.014
Repeatability and Refinement of a Transient Hot-wire Instrument for Measurement of the Thermal Conductivity of Eutectic Alloys Melts:	https://www.doi.org/10.1016/j.tca.2012.01.024
Thermal conductivities of solid and liquid phases in Pb Cd and Sn Zn	https://www.doi.org/10.1016/j.tca.2010.02.008
Thermophysical Properties of the Liquid Ga-In-Sn Eutectic Alloy:	https://www.doi.org/10.1007/s10765-006-0124-4
Measurement of zinc activity in the ternary In Zn Sn alloys by EMFmethod: NIST Webbook:	https://www.doi.org/10.1016/j.jct.2015.09.023
Temperature Dependence of the Velocity of Sound in Liquid Metals of Thermally Conductivities of solid and liquid phases for pure Al, pure Sn and their binary alloying of liquid systems for lead free soldering: Cu-Sb-Sn	https://www.doi.org/10.1016/j.tca.2007.01.009
Thermodynamic properties of liquid (antimony + tin) and (gold + antimony + tin) alloys determined Enthalpies of mensuration for Ga-Sn liquid alloys:	https://www.doi.org/10.1021/je400882q
A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals Pb,Cu and Bi	https://www.doi.org/10.1016/j.tca.2013.06.039
Dielectric Properties relevant for lead-free solders	https://www.doi.org/10.1016/j.fluid.2010.07.015
Thermophysical properties of the liquid Ga-Sn-Zn eutectic alloy:	https://www.doi.org/10.1016/j.tca.2010.10.010
Vapor-liquid phase equilibria of binary tin-antimony system in vacuum chamber: Experimental Investigation	https://www.doi.org/10.1016/j.jct.2015.01.010
Alloy calculation:	https://www.doi.org/10.1016/j.tca.2011.04.032
Odd even effect in melting properties of 12 alkane-a,x-diamides:	https://www.doi.org/10.1007/s10765-006-0057-y
	https://www.doi.org/10.1016/j.tca.2008.02.023
	https://www.doi.org/10.1016/j.fluid.2018.03.001
	https://www.doi.org/10.1016/j.tca.2016.02.012
	https://www.doi.org/10.1016/j.tca.2012.02.024
	https://www.doi.org/10.1016/j.jct.2006.04.004

Legend

dvisc:	Dynamic viscosity
ea:	Electron affinity
hf:	Enthalpy of formation at standard conditions
hfus:	Enthalpy of fusion at standard conditions
ie:	Ionization energy
sgb:	Molar entropy at standard conditions (1 bar)
speedsl:	Speed of sound in fluid
ss:	Solid phase molar entropy at standard conditions
tcondl:	Liquid thermal conductivity
tf:	Normal melting (fusion) point

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