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 ± 0.02	eV	NIST Webbook
ea	1.15 ± 0.15	eV	NIST Webbook
ea	1.11	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	7.28 ± 0.07	eV	NIST Webbook
ie	7.34	eV	NIST Webbook
ie	7.34	eV	NIST Webbook
ie	7.30 ± 0.20	eV	NIST Webbook
ie	7.34	eV	NIST Webbook
ie	7.40 ± 0.30	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

dvisc	0.0012530	Pa×s	873.00	A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Liquid Metals and Alloys
dvisc	0.0011420	Pa×s	973.00	A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Liquid Metals and Alloys
dvisc	0.0010870	Pa×s	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/m×K	603.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements	
tcondl	32.00	W/m×K	571.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements	
tcondl	30.70	W/m×K	534.30	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements	
tcondl	33.50	W/m×K	630.00	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements	
tcondl	34.30	W/m×K	678.20	A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements	

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

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

Sources

A Novel Vibrating Finger Viscometer for High-Temperature Measurements in Liquid Metals and Alloys:	https://www.doi.org/10.1007/s10765-016-2104-7
Repeatability and Refinement of a Transient Hot-wire Instrument for Measuring the Thermal Conductivity of High Temperature Melts:	https://www.doi.org/10.1007/s10765-006-0124-4
Partial and Integral Enthalpies of mixing of Ag-Ga-Sn liquid alloys:	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/10.1016/j.jct.2006.04.004
Thermal conductivities of solid and liquid phases in Pb Cd and Sn Zn binary eutectic alloys:	https://www.doi.org/10.1016/j.tca.2007.01.009
Thermodynamic properties of liquid Au-Cu-Sn alloys determined from electromotive force measurements:	https://www.doi.org/10.1016/j.tca.2011.08.011
Vapor-liquid phase equilibria of binary tineantimony system in vacuum distillation: Experimental investigation and calculation:	https://www.doi.org/10.1016/j.fluid.2016.02.012
Integral enthalpy of mixing of the liquid ternary Au-Cu-Sn system:	https://www.doi.org/10.1016/j.tca.2008.01.014
Thermophysical properties of the liquid Ga-Sn-Zn eutectic alloy:	https://www.doi.org/10.1016/j.fluid.2018.03.001
A Novel Instrument for the Measurement of the Thermal Conductivity of Molten Metals. Part II: Measurements	https://www.doi.org/10.1007/s10765-006-0057-y
Thermodynamic properties of liquid (antimony + tin) and (gold + antimony + tin) alloys determined from e.m.f. measurements:	https://www.doi.org/10.1016/j.jct.2015.01.010
Vaporization thermodynamics of the ZnO-SnO2 system:	https://www.doi.org/10.1016/j.jct.2013.11.010
Thermophysical properties of Ga-Zn eutectic alloys with Sn additions:	https://www.doi.org/10.1016/j.fluid.2018.07.008
Measurement of zinc activity in the ternary In Zn Sn alloys by EMFmethod:	https://www.doi.org/10.1016/j.tca.2013.06.039
Enthalpies of mixing of liquid systems for lead free soldering: Cu-Sb-Sn system:	https://www.doi.org/10.1016/j.tca.2010.10.010
Thermochemistry of Liquid Ni-Sb-Sn Alloys:	https://www.doi.org/10.1016/j.tca.2012.02.024
The measurement of thermal conductivity variation with temperature for Sn-20 wt.% In based lead-free ternary solders:	https://www.doi.org/10.1016/j.tca.2012.12.012
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C7440315&Units=SI
Thermophysical Properties of the Liquid Ga-In-Sn Eutectic Alloy:	https://www.doi.org/10.1021/je400882q
Temperature Dependence of the Velocity of Sound in Liquid Metals of Group XIV:	https://www.doi.org/10.1007/s10765-007-0151-9
Thermodynamics of uranium in (Ga + Sn) eutectic alloy:	https://www.doi.org/10.1016/j.jct.2015.09.023
Enthalpies of mixing of liquid Bi Cu and Bi Cu Sn alloys relevant for lead-free soldering:	https://www.doi.org/10.1016/j.tca.2008.02.023
Enthalpy of mixing of liquid systems for lead free soldering: The Ni-Sb-Sn system:	https://www.doi.org/10.1016/j.tca.2012.01.024
Enthalpies of Mixing of Liquid In-Sn and In-Sn-Zn Alloys:	https://www.doi.org/10.1016/j.tca.2010.02.008
Thermal conductivities of solid and liquid phases for pure Al, pure Sn and their binary alloys :	https://www.doi.org/10.1016/j.fluid.2010.07.015

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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