

Tin ${}_{50}\text{Sn}^{118.69}$

Known to ancient civilizations.

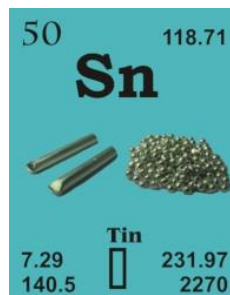
[Anglo-Saxon, tin; Latin, stannum]

French: etain

German: Zinn

Italian: stagno

Spanish: estaño



Atomic number	50
Density in g/cm ³	7.29
Atomic radius in pm	145
Atomic weight	118.71
Melting point in °C	231.97
Boiling point in °C	2270

Description: Tin is a soft, pliable, silvery-white metal that is unreactive to oxygen (protected by an oxygen film on the surface) and water. It dissolves in acids and bases. Tin is used in solder, alloys, tin plate, polymer additives and some anti-fouling paints.

TIN SINGLE CRYSTAL PROPERTIES

State:	single crystal
Crystal structure:	tetragonal
Production method:	Bridgeman
Standard size:	diameter 9-10mm thickness 1-2mm
Orientation:	(100), (110) and (111)
Orientation accuracy:	<2°, <1°, <0.4° or <0.1°
Polishing:	as cut, one or two sides polished
Roughness of surface:	<0.03µm
Purity:	99.999%
	C 3
	H < 1
	O 9
	N < 5
	Cu 1.60
	Fe 1.80
	Ni < 1
	Pb 0.30
	Si 0.30
	Ga, Hf and Ta are below the detection limit
Density:	7.30 g/cm ³
Melting point:	231.968 °C / 505.118 °K
Boiling point:	2269.85 °C / 2543 °K
Molar volume:	16.24 (b) cm ³
Thermal conductivity:	66.6 (a) [300 K] Wm-1K-1
Coefficient of linear thermal expansion:	5.3 x 10 ⁻⁶ (a) K-1
Electrical resistivity:	11.0x 10 ⁻⁸ (a) [273 K] Wm

Typical analysis (ppm):



Mass magnetic susceptibility:	-4.0 x 10 ⁻⁹ (a) kg-lm ³
Young's modulus:	49.9 GPa
Rigidity modulus:	18.4 GPa
Bulk modulus:	58.2 GPa
Poisson's ratio:	0.357
Radii:	Sn ⁴⁺ 74; Sn ²⁺ 93; Sn ⁴⁻ 294; atomic 141; covalent 1
Electronegativity:	1.96 (Pauling); 1.72 (Allred); 4.30 eV (absolute)
Effective nuclear charge:	5.65 (Slater); 9.10 (Clementi); 11.11 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	37
Isotope mass range:	106 -> 132
Crystal structure, (cell dimensions / pm), space group	tetragonal
X-ray diffraction: mass absorption coefficients:	CuK α 256 (μ/r) / cm ² g ⁻¹ MoK α 31.1 (μ/r) / cm ² g ⁻¹
Neutron scattering length:	0.6225 b/10 ⁻¹² cm
Thermal neutron capture cross-section:	0.626 sa / barns

