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Properties of silicon at 300K

Property	Value	Units
Atomic weight	28.09	
Atomic density	4.995×10^{14}	atoms/cm ²
Boiling point ^a	2,878	°C
Breakdown field	$\sim 3 \times 10^5$	V/cm
Bulk modulus	7.7×10^{11}	dynes/cm ²
Burgers vector	0.374	
Compliance <111> ^b	5.32×10^{-13}	cm ² /dyne
Covalent radius	0.118	nm
Critical density [1]	0.1207	g/cm ³
Critical pressure [1]	530	atm
Critical temperature [1]	4,886	°C
Critical volume [1]	232.6	cm ³ /g·mol
Crystal plane spacing (100) (110) (111)	0.543 0.383 0.313	nm nm nm
Crystal structure	diamond	
Density	2.33	g/cm ³
Density of surface atoms (100) (110) (111)	6.78×10^{14} 9.59×10^{14} 7.83×10^{14}	atoms/cm ² atoms/cm ² atoms/cm ²
Dielectric constant	11.8	
Effective density of states Conduction band Valence band	3.22×10^{19} 1.83×10^{19}	n/cm ³ n/cm ³
Elastic constant ^c C ₁₁ C ₁₂ C ₁₄	1.29×10^{12} 0.483×10^{12} 0.671×10^{12}	
Electron affinity (111) ^d	4.85	eV

Property	Value	Units
Electron effective mass at 4 ^o K ^e Longitudinal (m_l/m_0) Transverse (m_t/m_0) Density of states (m^*/m_0)	0.98 0.19 1.08	
Energy gap (see fig. 1.6)	1.12	eV
Hardness	7	Moh
Heat capacity [1]	4.78	cal/g·mol ^o C
Heat of fusion @ m.p. [1]	264	cal/g
Heat of sublimation @ m.p. [1]	4,075.0	cal/g
heat of vaporization @ m.p. [1]	3,812.0	cal/g
Hole effective mass at 4 ^o K ^f Heavy (m_1/m_0) Light (m_2/m_0) Density of states (m^*/m_0)	0.537 0.153 0.591	
Intrinsic carrier concentration (see fig. 1.7) n_i n_i^2	1.38×10^{10} 1.90×10^{20}	n/cm ³ n/cm ³
Intrinsic Debye length L Ln _i	28.7 4.0×10^{-7}	μm n/cm ²
Intrinsic resistivity	2.3×10^5	Ω·cm
Lattice constant	0.543	nm
Liquid density @ m.p. [1]	2.533	g/cm ³
Liquid heat capacity @ m.p. [1]	6.755	cal/g·mol ^o C
Liquid thermal capacity @ m.p. [1]	1.025×10^{-3}	cal/sec·cm· ^o C
Liquid viscosity @ m.p. [1]	0.88	centipoise
Melting point [1]	1,412±2	^o C
Minority carrier lifetime	2.5×10^{-3}	s
Nearest neighbor distance	0.235	nm
Percent expansion on freezing @ m.p. [1]	10%	
Poisson's ratio	0.27	
Refractive index	3.4	
Scattering limited velocity Electron Hole	$\sim 1.0 \times 10^7$ $\sim 8.4 \times 10^6$	cm/s cm/s
Shear modulus	7.55×10^{11}	dyne/cm ²
Surface tension @ m.p. [1]	736	dynes/cm
Symbol	Si	
Thermal conductivity [1]	0.353	cal/sec·cm· ^o C
Torsion modulus	3.97×10^{11}	dyne/cm ²

Property	Value	Units
Vapor pressure @ m.p. [1]	2.8×10^{-4}	mm Hg
Young's modulus (111) direction	1.9×10^{12}	dyne/cm ²

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