

## Silver ${}_{47}\text{Ag}^{107.87}$

Known to ancient civilizations

[Anglo-saxon: siolfur = silver; Latin: argentum]

French: argent

German: Silber

Italian: argento

Spanish: plata



Atomic number	47
Density in g/cm <sup>3</sup>	10.50
Atomic radius in pm	165
Atomic weight	107.87
Melting point in °C	961.93
Boiling point in °C	2212

**Description:** Silver is a soft, malleable metal with a characteristic silver sheen when polished. It is stable to water and oxygen but is slowly attacked by sulfur compounds in the air to form a black sulfide layer. Silver dissolves in H<sub>2</sub>SO<sub>4</sub> and HNO<sub>3</sub>. The metal is used for silverware, jewellery, mirrors and in the electrical industry because of its excellent conductivity; silver salts are used in photography.

### SILVER SINGLE CRYSTAL PROPERTIES

<b>State:</b>	Single crystal
<b>Crystal structure:</b>	fcc
<b>Production method:</b>	Czochralski
<b>Standard size:</b>	diameter 8-20mm thickness 1-2mm
<b>Orientation:</b>	(100), (110) and (111)
<b>Orientation accuracy:</b>	<2°, <1°, <0.4° or <0.1°
<b>Polishing:</b>	s cut, one or two sides polished
<b>Roughness of surface:</b>	<0.03µm
<b>Purity:</b>	99.999%
<b>Typical analysis (ppm):</b>	Au 1 Cu 2 Fe 2 Ni 1 Ag balance Al, Cd, Mg, Mn, Pt, Pd are below the detection limit
<b>Density:</b>	10.5 g/cm <sup>3</sup>
<b>Melting point:</b>	961.93 °C / 1235.08 °K
<b>Boiling point:</b>	2211.85 °C / 2485 °K
<b>Molar volume:</b>	10.27 cm <sup>3</sup>
<b>Thermal conductivity:</b>	429 [300 K] Wm <sup>-1</sup> K <sup>-1</sup>
<b>Coefficient of linear thermal expansion:</b>	19.2 x 10 <sup>-6</sup> K <sup>-1</sup>
<b>Electrical resistivity:</b>	1.59x10 <sup>-8</sup> [293 K] Ωm
<b>Mass magnetic susceptibility:</b>	-2.27 x 10 <sup>-9</sup> (s) kg <sup>-1</sup> m <sup>3</sup>
<b>Young's modulus:</b>	82.7 GPa

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<b>Rigidity modulus:</b>	30.3 GPa
<b>Bulk modulus:</b>	103.6 GPa
<b>Poisson's ratio:</b>	0.367
<b>Radii:</b>	Ag <sup>2+</sup> 89; Ag <sup>+</sup> 113; atomic 144
<b>Electronegativity:</b>	1.93 (Pauling); 1.42 (Allred); 4.44 eV (absolute)
<b>Effective nuclear charge:</b>	4.20 (Slater); 8.03 (Clementi); 11.35 (Froese-Fischer)
<b>Number of Isotopes (incl. nuclear isomers):</b>	46
<b>Isotope mass range:</b>	96 -> 122
<b>Crystal structure, (cell dimensions / pm), space group</b>	f.c.c. (a=408.626), Fm3m
<b>X-ray diffraction: mass absorption coefficients:</b>	CuK <sub>α</sub> 218 (μ/r) / cm <sup>2</sup> g <sup>-1</sup> MoK
<b>Neutron scattering length:</b>	63.6

