Stable isotopes of tellurium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Te-120	52	68	119.904048	0.09%	99.90%	Metal
Te-120	52	68	119.904048	0.09%	99.40-99.90%	Oxide
Te-122	52	70	121.903056	2.55%	99.90%	Metal
Te-122	52	70	121.903056	2.55%	99.90%	Oxide
Te-123	52	71	122.904271	0.89%	99.90%	Metal
Te-123	52	71	122.904271	0.89%	99.90%	Oxide
Te-124	52	72	123.902819	4.74%	99.90%	Metal
Te-124	52	72	123.902819	4.74%	99.90%	Oxide
Te-125	52	73	124.904424	7.07%	99.00-99.90%	Metal
Te-125	52	73	124.904424	7.07%	99.00-99.90%	Oxide
Te-126	52	74	125.903305	18.84%	96.60-99.90%	Metal
Te-126	52	74	125.903305	18.84%	96.60-99.90%	Oxide
Te-128	52	76	127.904462	31.74%	99.90%	Metal
Te-128	52	76	127.904462	31.74%	98.80-99.90%	Oxide
Te-130	52	78	129.906229	34.08%	≥99.70%	Metal
Te-130	52	78	129.906229	34.08%	≥99.70%	Oxide

Tellurium was discovered in 1783 by Franz-Joseph Müller Freiherr von Reichenstein, an Austrian mineralogist and mining engineer. Its name originates with the Latin word *tellus,* meaning “earth.”

Tellurium is a silvery white, lustrous solid. It is soluble in sulfuric acid, nitric acid, potassium hydroxide, potassium cyanide solution, caustic potash, and solutions of alkali metal cyanides. It is insoluble in water, carbon disulfide, benzene and hydrochloric acid. It burns in air with a greenish-blue flame; the combustion product is dioxide, the most stable oxide of the metal. Tellurium also forms other oxides: monoxide, trioxide and pentoxide. It combines with halogens, forming halides at different oxidation states. It also forms a black dichloride and a brown dibromide, usually by its reaction with dichlorodifluoromethane and trifluorobromomethane. It forms binary tellurides with several metals: the reaction is carried out by heating tellurium with a metal in stoichiometric amounts in the absence of air in an evacuated ampoule. Tellurium reacts with halides of several metals, when heated in a stream of hydrogen, to produce metal tellurides.

ISOFLEX
Isotopes for Science, Medicine and Industry

1-415-440-4433 | USA & Canada Toll Free 1-888-399-4433 | Fax 1-415-563-4433
PO Box 29475 | San Francisco, CA 94129 USA | isoflex.com

Small amounts of tellurium are added to stainless steel and copper to improve their machinability. It enhances the strength and hardness of lead and protects lead from the corrosive action of sulfuric acid. Tellurium also is a strong chilling agent in iron castings: it controls the chill and imparts a tough abrasion resistance to the surface. Tellurium is a curing agent for natural and synthetic rubber: it improves mechanical properties of the rubber, imparting resistance to heat and abrasion. It is a coloring agent in glass, ceramics and enamels. Traces of tellurium incorporated into platinum catalysts make the catalytic hydrogenation of nitric oxide favorable to the formation of hydroxylamine. A major application of tellurium is in semiconductor research. Tellurides of lead and bismuth are used in thermoelectric devices for power generation and refrigeration.

Human exposure to tellurium causes “garlic breath” due to dimethyl telluride, which persists for a considerable period after exposure. The toxic effects of tellurium are nausea, giddiness, headache, metallic taste, and dryness in the throat.

Properties of Tellurium

Name	Tellurium
Symbol	Te
Atomic number	52
Atomic weight	127.60
Standard state	Solid at 298 °K
CAS Registry ID	13494-80-9
Group in periodic table	16
Group name	Chalcogen
Period in periodic table	5
Block in periodic table	p-block
Color	Silvery lustrous gray
Classification	Semi-metallic
Melting point	452 °C
Boiling point	989.80 °C
Vaporization point	990 ºC
Thermal conductivity	(1.97–3.38) W/(m·K)

Properties of Tellurium (continued)

Electrical resistivity	4.36 x 10^5 μΩ·cm at 25 °C
Electronegativity	2.1
Heat of vaporization	48.00 kJ·mol^{-1}
Heat of fusion	17.50 kJ·mol^{-1}
Density of liquid	5.70 g/cm^3 at 452 °C
Density of solid	6.24 g/cm^3
Mohs hardness scale	2.30
Electron configuration	[Kr]$4d^{10}5s^25p^4$
Atomic radius	1.42 Å
Ionic radii	Te^{+4}: 0.97 Å and Te^{+6}: 0.5 6Å (coordination number 6)
Oxidation states	+2, +4, +6

1-415-440-4433 | USA & Canada Toll Free 1-888-399-4433 | Fax 1-415-563-4433
PO Box 29475 | San Francisco, CA 94129 USA | isoflex.com