

Tellurium (Te) - Student Datasheet

Element 52 · Metalloid · source-reviewed learning reference

Tellurium is element 52, a brittle Group 16 metalloid whose trigonal helical-chain structure links p-block bonding to thermoelectric compounds, solar materials and a supply chain dominated by by-product recovery.

Quick reference

Atomic number	52
Relative atomic mass	127.60
Electron configuration	[Kr] 4d ¹⁰ 5s ² 5p ⁴
Period / group / block	5 / 16 / p
State context	Silvery brittle metalloid
Density	6.232 g/cm ³
Melting / transition	722.66 K
Boiling / gas reference	1261 K
Oxidation states	+6, +4, −2
Electronegativity	2.1

Structure & orbitals

Crystalline tellurium forms spiral chains in a trigonal structure. The viewer uses a repeating helical-chain motif, not a complete crystallographic coordinate model.

The 5s/5p visuals are isolated-atom probability clouds; they are not the band structure of trigonal tellurium or telluride compounds.

Phase behavior

At approximately standard pressure, crystalline tellurium is solid below 722.66 K, liquid to about 1261 K, and gaseous above the boiling reference.

Five things to remember

- Atomic number 52 means 52 protons.
- Tellurium is commonly classified as a metalloid.
- Crystalline tellurium has trigonal helical chains.
- Tellurides and elemental tellurium are different chemical materials.
- Commercial tellurium is commonly recovered as a by-product of copper refining.

Tellurium: Real World & Signature Science

Element-specific science, uses and history

Big idea

Tellurium is often searched as “tellerium.” Spelling assistance should route that query to the same element, not create a duplicate page. Scientifically, Te metal-like appearance does not erase its common metalloid classification or its compound-specific behavior.

Why this element is scientifically distinctive

Explore Te across the teaching nucleus, isolated-atom orbitals, evidence-aware material structure and temperature/evidence views, then connect those models to uses, isotopes and source-backed context.

Thermoelectrics	Bismuth telluride and related compounds convert temperature differences and electrical energy in thermoelectric devices.
Solar materials	Cadmium telluride is a distinct semiconductor compound used in thin-film photovoltaic technology.
Metallurgy	Small tellurium additions can modify machinability or properties of selected metals.
By-product supply	Tellurium is commonly recovered from copper-refining residues rather than mined as native tellurium.
Spelling/search	“Tellerium” is a common misspelling; scientific identity remains Te, element 52.

From copper-refining by-product to tellurium materials: high-level path

1. Tellurium is dispersed in sulfide ore systems and is commonly concentrated in anode slimes during copper refining.
2. Further refining produces tellurium metal or compound feedstocks.
3. Manufacturing converts tellurium into specific compounds such as CdTe or Bi₂Te₃ with properties different from elemental Te.
4. Recycling may recover tellurium from selected manufacturing or end-of-life streams.

History checkpoints

1782	Franz-Joseph Müller von Reichenstein recognized an unusual component in Transylvanian ores.
1798	Martin Heinrich Klaproth confirmed the new element and named it tellurium, from Latin tellus for Earth.
20th century	Tellurium compounds became important in metallurgy, thermoelectrics and electronics.
Today	Supply remains closely connected to by-product recovery and semiconductor demand.

Tellurium: Isotopes, Questions & Evidence

Evidence status and learner self-check

Isotope context

¹³⁰ Te	Very long-lived double-beta emitter	One of tellurium's naturally occurring isotopes; its decay half-life is enormous.
¹²⁸ Te	Very long-lived double-beta emitter	Another extraordinarily long-lived natural radioisotope.
Natural tellurium	Multiple stable and very long-lived isotopes	Relative atomic mass represents a complex natural mixture.

Common questions

What is tellurium?

Tellurium is chemical element 52, symbol Te, commonly classified as a metalloid.

Is tellurium a metal?

It has a metallic appearance but is commonly classified as a metalloid.

What is tellurium used for?

Important uses are mostly through compounds, including thermoelectric materials and CdTe solar cells, plus some metallurgy.

What element is Te?

Tellurium, atomic number 52.

Quick self-check

Q: What is tellurium's symbol? | Answer: Te. Te identifies element 52.

Q: How is tellurium commonly classified? | Answer: Metalloid. Its behavior lies between typical metals and nonmetals.

Q: What structural motif characterizes crystalline Te? | Answer: Helical chains. Trigonal tellurium is chain-based.

Evidence & safety

Atomic and phase values are evaluated. The structural viewer is a helical-chain teaching motif grounded in trigonal tellurium. Supply geography is by-product context, not a native-element mine map.

Elemental tellurium and tellurium compounds can differ substantially in hazard and biological behavior; use substance-specific safety information.

Core sources

Royal Society of Chemistry - Tellurium

<https://periodic-table.rsc.org/element/52/tellurium>

Los Alamos National Laboratory - Tellurium

<https://periodic.lanl.gov/52.shtml>

USGS - Mineral Commodity Summaries 2026

<https://pubs.usgs.gov/publication/mcs2026>