

Antimony (Sb) - Student Datasheet

Element 51 · Metalloid · source-reviewed learning reference

Antimony is element 51, symbol Sb: a brittle Group 15 metalloid whose symbol comes from the Latin stibium. Its A7 structure, +3/+5 chemistry and compound uses make it a strong case for separating an element from the materials that contain it.

Quick reference

Atomic number	51
Relative atomic mass	121.760
Electron configuration	[Kr] 4d ¹⁰ 5s ² 5p ³
Period / group / block	5 / 15 / p
State context	Brittle silvery-gray metalloid
Density	6.68 g/cm ³
Melting / transition	903.778 K
Boiling / gas reference	1860 K
Oxidation states	+5, +3, −3
Electronegativity	2.05

Structure & orbitals

Stable gray antimony has the rhombohedral A7 structure. The viewer uses a simplified rhombohedral motif and does not represent molecular or compound allotropes.

The 5s/5p clouds are isolated-atom probability models. They do not depict bonding in Sb compounds or the band structure of crystalline antimony.

Phase behavior

At approximately standard pressure, gray antimony is solid below 903.778 K, liquid to about 1860 K, and gaseous above the boiling reference.

Five things to remember

- Atomic number 51 means 51 protons.
- Sb comes from the historical Latin name stibium.
- Antimony is commonly classified as a metalloid.
- Stable gray antimony is rhombohedral A7.
- Antimony metal and antimony compounds can have very different uses and hazards.

Antimony: Real World & Signature Science

Element-specific science, uses and history

Big idea

The question “Why is antimony Sb?” is historical rather than electronic: Sb comes from stibium, the Latin name associated with antimony compounds. The symbol is not an abbreviation of the English word.

Why this element is scientifically distinctive

Explore Sb 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.

Alloys	Antimony is used to harden or modify selected lead- and tin-based alloys.
Flame-retardant systems	Antimony compounds can be used synergistically in some flame-retardant formulations; this is compound chemistry, not elemental Sb behavior.
Semiconductors	III-V materials such as indium antimonide use antimony in distinct crystalline compounds.
Battery materials	Antimony participates in selected alloy and emerging energy-storage material systems.
Evidence distinction	Commercial uses often involve compounds, so the chemical form must be named.

From antimony-bearing minerals to materials: high-level path

1. Antimony commonly occurs in minerals such as stibnite rather than as native bulk metal.
2. Industrial processing produces antimony metal or oxide/compound feedstocks.
3. Those feedstocks enter alloy, chemical and semiconductor supply chains.
4. Recycling and secondary recovery can contribute to supply; no extraction recipe is provided here.

History checkpoints

Ancient world	Antimony sulfide minerals were used in pigments and cosmetics long before elemental chemistry was understood.
Early modern chemistry	Metallic antimony and its compounds were described in European metallurgical texts.
Modern chemistry	Sb became the standardized symbol from stibium.
Today	Antimony is important in alloys, compounds and critical-mineral supply discussions.

Antimony: Isotopes, Questions & Evidence

Evidence status and learner self-check

Isotope context

¹²¹ Sb	Stable natural isotope	Reference teaching nucleus with 51 protons and 70 neutrons.
¹²³ Sb	Stable natural isotope	The second stable natural isotope.
Natural antimony	Two stable isotopes	Relative atomic mass reflects their abundance mixture.

Common questions

What is antimony?

Antimony is chemical element 51, symbol Sb, commonly classified as a metalloid.

Why is antimony Sb?

Sb comes from stibium, a historical Latin name associated with antimony.

Is antimony a metal or metalloid?

It is commonly classified as a metalloid, with a brittle metallic-looking elemental form.

What is antimony used for?

Antimony is used in alloys and, more often, through compounds in flame-retardant systems, semiconductors and specialty materials.

Quick self-check

Q: What is antimony's symbol? | Answer: Sb. Sb comes from stibium.

Q: How is antimony commonly classified? | Answer: Metalloid. Classification reflects its mixed metallic/nonmetallic characteristics.

Q: What is the ordinary gray structure? | Answer: Rhombohedral A7. Gray antimony is an A7-type solid.

Evidence & safety

Atomic and ordinary phase values are evaluated. Gray-antimony A7 structure is measured; the viewer is schematic.

Commodity geography is dated context and does not imply native-element deposits.

Antimony metal and antimony compounds differ in hazard. Do not generalize safety from one chemical form to another.

Core sources

Royal Society of Chemistry - Antimony

<https://periodic-table.rsc.org/element/51/antimony>

Los Alamos National Laboratory - Antimony

<https://periodic.lanl.gov/51.shtml>

USGS - Mineral Commodity Summaries 2026

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