



>>Entry Name: Antimony

Synonym(s): Stibium (L.)

CAS Registry Number: 7440-36-0

Related CAS Registry Numbers(s): 12597-17-0 22537-51-5 22679-96-5 23713-48-6 32679-33-7 37267-70-2

Sb

Molecular Formula: Sb

Molecular Weight: 121.75

Accurate Mass: 120.903821

Percentage Composition: Sb 100.00%

General Statement: Atomic No. 51. Ground state electron config. $[\text{Kr}]4d^{10}5s^25p^3$. 29 Isotopes are known of which two, ^{121}Sb (57%) and ^{123}Sb (43%), are stable and of value in nmr spectroscopy. Known since ancient times when used e.g. in paints for pottery and in cosmetics. Polymorphic with grey (α), yellow and black forms: additionally there are high pressure modifications. Abundance: 0.2 ppm (earth's crust), 0.0005 ppm (sea water)

Source/Synthesis: Main source is Antimony sulfide (Sb_2S_3) [HTG52-U](#) (in other metal sulfide ores) which when heated with Fe $\rightarrow$ Sb. Also obt. from flue dusts and by electrolysis of leached Na_3SbS_4 , or by volatilisation of Antimony oxide (Sb_2O_3) [HTG29-S](#). Also prepd. by redn. of Antimony oxide (Sb_2O_5) [HTG36-S](#) with H_2 or KCN

Use/Importance: Long used in pewter, medicines, bell metals and paints for pottery. Now used as alloy with Pb in batteries, solders, type metals and more recently in superconductor devices

Other Data: Less reactive than As, but otherwise similar in behaviour. Stable to air and moisture at r.t. With air or oxygen on heating $\rightarrow$ Sb_2O_3 , Sb_2O_5 . Reacts vigorously with Cl_2 , less readily with Br_2 , I_2 . S + heat $\rightarrow$ Sb_2S_3 . Hot conc. $\text{HNO}_3 \rightarrow$ Antimony oxide (Sb_2O_5) [HTG36-S](#). Reacts with HF $\rightarrow$ fluorides and complexes. Reacts with $\text{H}_2\text{SO}_4 \rightarrow$ Antimony sulfate ($\text{Sb}_2(\text{SO}_4)_3$) [HTP12-B](#). The vapour at ca. 750° contains Sb: Sb_2 : Sb_4 in the ratio 1:32:72

Hazard & Toxicity: The free element can normally be handled safely, but an explosive form (produced electrolytically) is known

Aldrich: 26483-0

Fluka: 10770

>>Variant: α -form

Molecular Formula: Sb

Molecular Weight: 121.75

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Percentage Composition: Sb 100.00%

General Statement: Rhombohedral lattice with Sb-Sb 290.8 pm (3 nearest coplanar neighbours) and 335.5 pm, with SbSbSb 96.6°

Physical Description: A brittle, lustrous, bluish-white metalloidal element which can be powdered

Melting Point: Mp 630-631°

Boiling Point: Bp 1587° (1645°)

Other Data: d^{26} 6.70 g cm⁻³. Poor conductor of heat and electricity

>>Variant: Yellow-form

Molecular Formula: Sb

Molecular Weight: 121.75

Accurate Mass: 120.903821

Percentage Composition: Sb 100.00%

General Statement: May be Sb_4

Physical Description: Unstable at temps. higher than -90°

>>Variant: Black-form

Molecular Formula: Sb

Molecular Weight: 121.75

Accurate Mass: 120.903821

Percentage Composition: Sb 100.00%

Source/Synthesis: Obt. by cooling gaseous Sb

>>Variant: High pressure I-form

Molecular Formula: Sb

Molecular Weight: 121.75

Accurate Mass: 120.903821

Percentage Composition: Sb 100.00%

General Statement: Exists with primitive cubic lattice having 6 equidistant neighbours

Source/Synthesis: Obt. at 7×10^4 atm. from the rhombohedral form