



>>Entry Name: Silica, 9CI

ENTRY UNDER REVIEW

Synonym(s): Silicon dioxide. Silicic anhydride. Silicon(IV) oxide (SiO₂)

CAS Registry Number: 7631-86-9

Related CAS Registry Numbers(s): 10279-57-9 12173-08-9 14832-85-0 14832-86-1 14832-92-9 16610-72-3 18587-85-4 18723-06-3 19472-03-8 20243-18-9 24270-57-3 29847-98-1

Extra CAS Registry Numbers(s): 11126-22-0 98759-73-0

SiO₂

Molecular Formula: O₂Si

Molecular Weight: 60.084

Accurate Mass: 59.966757

Percentage Composition: O 53.26%; Si 46.74%

cristobalite), 3 high-pressure cryst. phases (keatite, coesite and stishovite), various microcryst. materials and several noncryst. forms such as vitreous silica and silica gel

Source/Synthesis: Occurs widely in nature. Films produced by "remote" plasma-enhanced CVD of (C₅Me₅)SiH₃ at 200° have no C contamination: a method for producing high-purity films at low temp.

Use/Importance: Source of elemental Si. Basic material in the glass, refractory and ceramic industries. Pharmaceutical excipient (adsorbent, anticaking agent, glident, disintegrant etc). Has many other uses

Physical Description: Transparent, tasteless cryst. or amorphous powder. Melts to a glass. At ordinary temps., chemically resistant to most reagents

Melting Point: Mp 1716-1736°

Boiling Point: Bp 2230°

Solubility: Insol. H₂O; sol. HF (giving fluorosilicate ions)

Hazard & Toxicity: Toxic as an acute irritating dust. The chief cause of pulmonary dust disease. Prolonged inhalation may result in silicosis

Aldrich: 42155-3

Sigma: C0766

>>Variant: Low temp. crystalline-form

Synonym(s): Quartz, 9CI. Sand. Smokey quartz. Rose quartz. Amethyst. Citrine. Chalcedony. Carnelian. Agate. Onyx. Jasper. Heliotrope. Morion. Many other names describing impure forms

CAS Registry Number: 14808-60-7

Extra CAS Registry Numbers(s): 14639-89-5 14832-91-8 15723-40-7

Molecular Formula: O₂Si

Molecular Weight: 60.084

Accurate Mass: 59.966757

Percentage Composition: O 53.26%; Si 46.74%

Source/Synthesis: The most common of all minerals. A v. important rock-forming mineral, being an essential constituent of many igneous, metamorphic and sedimentary rocks, (eg. granite, sandstone). Also common in sand and gravel deposits. Synthetic cryst. are manuf. by hydrothermal methods

Use/Importance: Used for frequency control in electrical oscillators and filters and in electromechanical transducers

Physical Description: White to reddish cryst. Stable below 870°. Low (α-) quartz, stable at r.t.; transforms to high (β-) quartz at 574°; the two forms are related by small rotations of the SiO₄ tetrahedra. Piezoelectric and pyroelectric

Aldrich: 27473-9

Fluka: 84878

Sigma: S9887

>>Variant: Mid temp. crystalline-form

Synonym(s): Tridymite, 9CI

CAS Registry Number: 15468-32-3

Molecular Formula: O₂Si

Molecular Weight: 60.084

Accurate Mass: 59.966757

Percentage Composition: O 53.26%; Si 46.74%

systems where the overall framework is retained but some Si is replaced by Al and cations (usually alkali metal) occupy the interstices

Source/Synthesis: Rare; occurs in certain siliceous volcanic rocks. Formed from quartz above 87° in the presence of a mineraliser

Use/Importance: An important constituent of many refractories

Physical Description: White cryst. High (β-) tridymite is stable from 870-1470° at atmospheric pressure, but persists as a metastable phase below 870° forming low tridymite below 117° and middle tridymite from 117-163°