



>>Entry Name: Tin(IV) oxide (SnO₂), 9CI

Synonym(s): Stannic oxide. Tin dioxide. Stannic anhydride. Flowers of tin. Tin ash

CAS Registry Number: 18282-10-5

Related CAS Registry Numbers(s): 22650-91-5

SnO₂

Molecular Formula: O₂Sn

Molecular Weight: 150.709

Accurate Mass: 149.89203

Percentage Composition: O 21.23%; Sn 78.77%

Source/Synthesis: Synth. by blowing hot air over molten Sn. Thin films for use in devices obt. by CVD of Bu₂Sn(OAc)₂ onto an alumina substrate. Nanocrystalline powders prod. by dehydration/calcination of Na₂Sn(OH)₆ or SnO₂(H₂O)_n (α-stannic acid)

Use/Importance: Used in the ceramics and glass industry and as a catalyst. Used as sensing agent for detn. of reducing gases (H₂, CO, H₂S, CH₄, NO_x) and also traces of O₂ (sub-ppm) in inert gases. Used as transparent electrodes and solid-state gas sensor

Physical Description: White cryst.

Melting Point: Mp 1630°

Boiling Point: Subl. 1800-1900°

Solubility: Insol. H₂O, MeOH

Other Data: *n*-type semiconductor. Nanocrystalline material, particle sizes 2-30 nm; Raman spectral signature characteristic of crystallite size; can be related to vol. and surface modes

Aldrich: 24465-1

Fluka: 96550

>>Variant: Mineral-form

Synonym(s): Cassiterite

CAS Registry Number: 1317-45-9

Molecular Formula: O₂Sn

Molecular Weight: 150.709

Accurate Mass: 149.89203

Percentage Composition: O 21.23%; Sn 78.77%

Source/Synthesis: Principal tin ore, widespread occurrence

Physical Description: Tetragonal cryst., various colours

References:

Dana's System of Mineralogy, 7th Ed., Wiley, N.Y., 1944, **1**, 574, (*mineral*)

Cordey-Hayes, M., *J. Inorg. Nucl. Chem.*, 1964, **26**, 915, (*Mössbauer*)

Scott, J.F., *J. Chem. Phys.*, 1970, **53**, 852, (*Raman*)

Soito, K. *et al.*, *Mater. Res. Bull.*, 1975, **10**, 677, (*cryst struct*)

Kirk-Othmer Encycl. Chem. Technol., 3rd edn., Wiley, 1978, **23**, 48, (*rev*)

Capehart, T.W. *et al.*, *J. Vac. Sci. Technol.*, 1981, **18**, 393, (*use, sensors*)

Kohl, D., *Sens. Actuators*, 1989, **18**, 71, (*use, sensors*)

Allegretti *et al.*, *Sens. Actuators*, 1993, **B10**, 191, (*synth, use, sensors*)

Abello, L. *et al.*, *J. Solid State Chem.*, 1998, **135**, 78-85, (*nanocrystalline form, synth, powder, struct, sem, ir, Raman*)