>>**Entry Name: Indium(*III*) oxide (In_2O_3)**

CAS Registry Number: 1312-43-2
In_2O_3

Molecular Formula: In_2O_3
Molecular Weight: 277.638
Accurate Mass: 277.792505

Source/Synthesis: Obt. by thermal dec. of indium hydroxide, nitrate, sulfate, or carbonate. Various forms by hydrothermal synthesis from In_2O_3-H_2O or In_2O_3-H_2O-NaOH mixts. Films can be prod. by reactive deposition, in which composition is dependent on O_2 pressure and substrate temp. Tin-doped oxide (ITO, 0.5-9% Sn) synth. by calcination at 1400° of mixt. of In_2O_3 + SnO_2
Use/Importance: Commercially available. Thin films used as transport conductors. Tin-doped oxide used as transparent electrodes in LCDs and heat-reflection filters
Other Data: ΔH_f° –916 kJ mol^{-1}. Tin-doped oxide; exhibits high elect. conductivity (<=10^4 Ω^{-1} cm^{-1}), high transparency in vis. range and high ir reflectivity for wavelengths >= 1 μm; acts as wide-gap semiconductor, with electrons as major charge carriers: elect. conductivity decreases with increasing $Sn^{4(+)}$ content

Aldrich: 34299-8
Fluka: 57140
Sigma: I9765

>>**Variant:** Low-pressure-form
Synonym(s): Form-I

Molecular Formula: In_2O_3
Molecular Weight: 277.638
Accurate Mass: 277.792505
Percentage Composition: In 82.71%; O 17.29%

Physical Description: Dark green or yellow cryst.

>>**Variant:** High-pressure-form
Synonym(s): Form-II

Molecular Formula: In_2O_3
Molecular Weight: 277.638
Accurate Mass: 277.792505

Physical Description: Colourless cryst.
Other Data: Semiconductor: E_g 3.8 eV

References:

Roy, R. *et al.*, *J. Phys. Chem.*, 1954, **58**, 372, *(synth)*
Marezio, M.*, Acta Cryst. B*, 1966, **20**, 723, *(cryst struct low press form)*
Weiher *et al.*, *J. Appl. Phys.*, 1966, **37**, 299, *(opt props)*
Burns, R.P. *et al.*, *J. Chem. Phys.*, 1966, **44**, 3307, *(ms, thermodyn props)*
Christensen *et al.*, *Acta Chem. Scand.*, 1967, **21**, 1046, *(cryst struct high press form, synth)*
Grannec, J. *et al.*, *Bull. Soc. Chim. Fr.*, 1967, 4281, *(ir)*
Prewitt, C.T. *et al.*, *Inorg. Chem.*, 1969, **8**, 1985, *(cryst struct high press form, synth, props)*
Svergun, V.I. *et al.*, *Izv. Akad. Nauk SSSR, Ser. Khim.*, 1970, 1676, *(nqr)*
Gromakov, S.D. *et al.*, *Russ. J. Phys. Chem. (Engl. Transl.)*, 1972, **46**, 91, *(props)*
McGuire, G.E. *et al.*, *Inorg. Chem.*, 1973, **12**, 2450, *(pe)*
Brauer, G.*, Handbuch Prap. Anorg. Chem.*, 3rd edn., Ferdinand Enke Verlag, 1975, **2**, 871, *(synth)*
Bastow, T.J. *et al.*, *J. Magn. Reson.*, 1975, **20**, 1, *(nqr)*
Nichols, G.D. *et al.*, *Inorg. Nucl. Chem. Lett.*, 1977, **15**, 401, *(pe, Auger)*
Muranaka, S. *et al.*, *J. Mater. Chem.*, 1993, **3**, 237, *(manuf, films, synth, cryst struct, tem)*
Nadaud, N. *et al.*, *J. Solid State Chem.*, 1998, **135**, 140-148, *(synth, nd, powder struct, exafs, Mössbauer, Sn-doped oxide)*