



Tin Chloride Dihydrate

Stannous Chloride

Catalog Nr. Q555

Definition Tin(II) chloride (stannous chloride) is a white crystalline solid with the formula SnCl₂. It forms a stable dihydrate, but aqueous solutions tend to undergo hydrolysis, particularly if hot. SnCl₂ is widely used as a reducing agent (in acid solution), and in electrolytic baths for tin-plating. Tin(II) chloride should not be confused with the other chloride of tin; tin(IV) chloride or stannic chloride (SnCl₄).

CAS Number 10025-69-1

Application A solution of tin(II) chloride containing a little hydrochloric acid is used for the tin-plating of steel, in order to make tin cans. An electric potential is applied, and tin metal is formed at the cathode via electrolysis.

It is used as a catalyst in the production of the plastic polylactic acid (PLA).

Tin(II) chloride also finds wide use as a reducing agent. This is seen in its use for silvering mirrors, where silver metal is deposited on the glass: {Sn²⁺(aq) + 2 Ag⁺ → Sn⁴⁺(aq) + 2 Ag(s) }

A related reduction was traditionally used as an analytical test for Hg₂²⁺(aq). For example, if SnCl₂ is added dropwise into a solution of mercury(II) chloride, a white precipitate of mercury(I) chloride is first formed; as more SnCl₂ is added this turns black as metallic mercury is formed. Stannous chloride can be used to test for the presence of gold compounds. SnCl₂ turns bright purple in the presence of gold.

In organic chemistry, SnCl₂ is mainly used in the Stephen reduction, whereby a nitrile is reduced (via an imidoyl chloride salt) to an imine which is easily hydrolysed to an aldehyde.[3] The reaction usually works best with aromatic nitriles Aryl-CN. A related reaction (called the Sonn-Müller method) starts with an amide, which is treated with PCl₅ to form the imidoyl chloride salt. The Stephen reduction is less used today, because it has been mostly superseded by diisobutylaluminium hydride reduction.

Additionally, SnCl₂ is used to selectively reduce aromatic nitro groups to anilines [4]

Technical Data

PROPERTIES

Appearance: Colorless crystals.
Odor: Slight odor of hydrochloric acid.
Solubility: 118g/100ml water @ 0C (32F).
Specific Gravity: 2.71
Melting point: 38°C
Density: 2.71 g/cm³
Solubility in water: very good (>100 g/100 ml at 20°C)
Decomposes below boiling point at 652°C

Hazardous Decomposition Products: When heated to decomposition it emits toxic and corrosive fume of hydrochloric acid.

Hazardous Polymerization: Will not occur.