



Product Data Sheet

Thionyl Chloride (SOCl₂)

CAS No. 7719-09-7 | EC No. 231-748-8

Description

Thionyl chloride (SOCl₂) is a versatile and highly reactive chemical widely used as a chlorinating and dehydrating agent. It is a colorless to pale yellow liquid with a pungent odor, and decomposes on contact with water to release hydrogen chloride (HCl) and sulfur dioxide (SO₂).

Typical Properties

Parameter	Specification
Chemical Formula	SOCl ₂
Molecular Weight	119 g/mol
Appearance	Colorless to pale yellow fuming liquid
Odor	Suffocating Odor
Purity	99.70%
Sulphur Chloride (SCl ₂ + S ₂ Cl ₂)	0.1% Max
Sulphuryl Chloride (SO ₂ Cl ₂ +SO ₃)	500 ppm Max
Sulphur Dioxide (SO ₂)	1000 ppm Max
Iron	5 ppm Max
Residue on ignition	0.01 Max
Distillation Range	95% distils between 74°C to 78°C
Boiling Point	74.6 °C
Melting Point	-105.5 °C
Density (at 20 °C)	1.638 g/cm ³

Applications

- Chlorinating agent for conversion of alcohols to alkyl chlorides and carboxylic acids to acyl chlorides.
- Intermediate in pharmaceutical and agrochemical production.
- Used in dyes, pigments, and optical brightener intermediates.
- Production of chlorosulfonated polyethylene (CSM, Hypalon).
- Electrolyte and cathode material in lithium-thionyl chloride (Li/SOCl₂) batteries.
- Laboratory reagent for preparation of acid chlorides, sulfonyl chlorides, and halogenated compounds.
- Raw material for surfactants, plasticizers, and flame retardants.

Safety & Handling

Thionyl chloride is toxic, corrosive, and reacts violently with water to release harmful gases. Proper personal protective equipment (PPE) such as gloves, goggles, and chemical-resistant clothing should be used. It must be handled under dry and well-ventilated conditions, preferably in a fume hood. Refer to the product Safety Data Sheet (SDS) for detailed information.