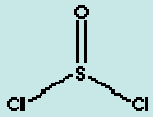
THIONYL CHLORIDE

PRODUCT IDENTIFICATION



CAS NO.	7719-09-7
EINECS NO.	231-748-8
FORMULA	$SOCl_2$
MOL WT.	118.97
H.S. CODE	2812.10
TOXICITY	
SYNONYMS	Sulfinyl chloride; Sulfur chloride oxide; Thionyl dichloride; Sulfurous dichloride; Sulfurous Oxychloride;
PRICE CLASSIFICATION	U$2,800/mt CFR European main port (10mts basis)

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	clear to yellow liquid
MELTING POINT	-104 C
BOILING POINT	76 C
SPECIFIC GRAVITY	1.64
SOLUBILITY IN WATER	Decomposes
pH	
VAPOR DENSITY	
AUTOIGNITION	
NFPA RATINGS	Health: 4 Flammability: 0 Reactivity: 2 Other: Water reactive
REFRACTIVE INDEX	
FLASH POINT	Not considered to be a fire hazard
STABILITY	Hydrolyzes in presence of moisture

GENERAL DESCRIPTION & APPLICATIONS

- Sulfinyl chloride: $SOCl_2$
- Sulfoxide: R_2SO
- Sulfuryl chloride: SO_2Cl_2
- Sulfone: R_2SOO
- Sulfonyl chloride: RSO_2Cl

Sulfinyl chloride is the S(IV) compound as a source of chloride ions but Sulfuryl chloride is the S(VI) compound as a source of chlorine.

Other names of sulfinyl chloride include sulfurous oxychloride and thionyl chloride (the term of sulfinyl is for the bivalent radical, -SO-, while sulfonyl refers to $-SO_2$). The molecule shape of thionyl chloride ($SOCl_2$) is tetrahedral, indicating the presence of a lone pair of electrons on the S(IV) center, whereas that of phosgene ($COCl_2$) is planar. In many reactions and chemical properties, thionyl chloride is analogous to phosphoryl chloride (phosphorus oxychloride) which has three P-Cl bonds and one very strong P=O solid bond. Sulfonates resemble carboxylates; -C(=O)- is replaced by $-S(=O)_2-$.

Thionyl chloride is a clear to yellow, fuming liquid, with pungent odour. It is corrosive and reactive liquid with boiling point 76 C. It reacts with water violently to produce toxic fumes of sulfur dioxide and hydrogen chloride and decomposes on heating above 140 C, releasing toxic and corrosive

fumes. It readily reacts with amines and metals.

Thionyl chloride is prepared from the reaction of sulfur trioxide and sulfur dichloride. It can be also obtained from the reaction between sulfur dichloride and phosphorus chloride. Thionyl chloride is used as a chlorinating agent in chemical reactions and as the positive active material in lithium-thionyl chloride batteries. alkyl radicals into biologically active molecules and thereby prevent their proper functioning. Thionyl chloride has also been used as a methylating agent which means a component in poison gases. Thionyl chloride is used in the organic synthesis include:

- the preparation of acid chlorides (acyl chlorides, sulfonyl chlorides, phosphoryl chlorides)which are used to prepare many other derivatives
- Chlorination of alcohols to yield alkyl chloride.
- Dehydration of primary amides to produce isocyanides, nitriles and imidoyl chlorides.

Sulfuryl Chloride is the Sulfuric oxychloride where as sulfinyl chloride is the sulfurous oxychloride.Sulfuryl Chloride is a colorless to yellowish liquid with a pungent odor. It boils at 69°C, decomposed by hot water and alkalies; soluble in most organic solvents (benzene, chloroform, carbon tetrachloride and acetic acid). It is not found in nature due to strong hydrolysis. It is explosive also with donor solvents such as alcohols, ethers, DMSO and DMF. It decompose at its boiling point. It has two S-Cl signle bonds and two S=O solid bonds. It is prepared by the reaction of sulfur dioxide and chlorine in the presence of activated carbon. It is used as a solvent and as a source of chlorine in chemical reactions. Sulfuryl chloride is useful mainly in preparing pesticides. It is used as a chlorinating (and sulfochlorinating) agent of alcohols, alkyls, aromatics, and epoxides for the target molecules of pharmaceuticals, disinfectants, dyestuffs, rayon, and poison gases. Chlorination in organic synthesis with sulfuryl chloride is more selective than elementary chlorine. It is useful to avoid secondary reactions. Chlorination of alcohols to yield alkyl chloride.

SALES SPECIFICATION	
APPEARANCE	clear to yellow liquid
ASSAY	98.0% min
DISTILLATION RANGE	73 - 79 C
SPECIFIC GRAVITY	1.62 - 1.65
Fe	5ppm max
TRANSPORTATION	
PACKING	300kgs in drum
HAZARD CLASS	8 (Packing Group: I)
UN NO.	1836
REMARKS	
Hazard Symbols: C, Risk Phrases: 14-20/22-29-3514-34-37, Safety Phrases: 26-36/37/39-45	