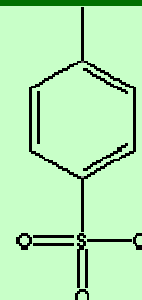


# p-TOLUENESULFONYL CHLORIDE

## PRODUCT IDENTIFICATION

CAS NO.	98-59-9
EINECS NO.	202-684-8
FORMULA	CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> SO <sub>2</sub> Cl
MOL WT.	190.65
H.S. CODE	2904.90
TOXICITY	
SYNONYMS	4-Toluolsulfonyl chloride; p-Tosyl Chloride; PTSC;



Tosyl chloride; 4-methylbenzene sulfonyl chloride; para-Toluenesulfochloride;

## DERIVATION

## CLASSIFICATION

## PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	White crystalline powder
MELTING POINT	67 C
BOILING POINT	134 C (Decomposes)
SPECIFIC GRAVITY	
SOLUBILITY IN WATER	Insoluble
pH	
VAPOR DENSITY	
AUTOIGNITION	
NFPA RATINGS	Health: 3 Flammability: 1 Reactivity: 0
REFRACTIVE INDEX	
FLASH POINT	109 C
STABILITY	Unstable. Highly reactive hygroscopic. Hydrolyzes to hydrogen chloride and p-toluenesulfonic acid

## GENERAL DESCRIPTION & APPLICATIONS

Sulfonic acid is a compound with general formula RSO<sub>2</sub>OH, where R is an aliphatic or aromatic hydrocarbon. It is a derivative of sulfuric acid (HOSO<sub>2</sub>OH) where an OH has been replaced by a carbon group or a compound where a hydrogen atom has been replaced by treatment with sulfuric acid; for example, benzene is converted to benzenesulfonic acid (water-soluble). Sulfonic acid has a sulfur atom bonded to a carbon atom of a hydrocarbon and bonded also to three oxygen atoms, one of which has been attached to a hydrogen atom.

Sulfonic acid is acidic due to the hydrogen atom, stronger than a carboxylic acid. Sulfonic acid is one of the most important organo sulfur compounds in organic synthesis. Sulfonic acids are used as catalysts in esterification, alkylation and condensation reactions. Sulfonates are salts or esters of sulfonic acid. Sulfonic salts are soluble in water. Sulfonic acid and its salts present in organic dyes provide useful function of water solubility and or improve the washfastness of dyes due to their capability of binding more tightly to the fabric.

They are widely used in the detergent industry. Alkylbenzene sulfonic acid is the largest-volume synthetic surfactant because of its relatively low cost, good performance, the fact that it can be dried to a stable powder and the biodegradable environmental friendliness. Sulfonate cleaners do not form an insoluble precipitates in hard water. Sulfonic acid salts and esters are intermediates widely used in organic synthesis and particularly phenolic compounds and cation exchange resins.

They are synthetic intermediates for a number of biologically active compounds and pharmaceutical candidates such as sulfa drugs.

Benzenesulfonic acid consumption is linked mostly to phenol and resorcinol production with sodium hydroxide. It is used as a catalyst for dehydration and used in solidifying resins. It is a base material for electroplating solutions. Benzenesulfonic acid, or a derivative thereof, is used as a synthetic intermediate for a number of chemical families of pharmaceuticals, pesticides, dyes, pigments, fluorescent brighteners, and other organic compounds. Commercially, benzenesulfonic acid sodium salt is more common due to high deliquescence of the base material.

Xylenesulfonic acid and its salts are hydrotropic solvents used in detergents, shampoos, degreasing compounds and printing pastes. They are used to extract pentosans and lignin in the paper industry and as an additive for glues.

The term of tosyl is for p-toluene sulfonic acid ester functional group, the conjugate base of the strong acid, p-toluenesulfonic acid. The tosyl group, like other sulfonates, has electron-withdrawing properties. It is a highly reactive leaving group due to the stability of resonance structure. It has a distributed negative charge rather than a localized charge. Each oxygen atom bears one-third of the total negative charge. The tosyl group serves as a protecting group which is readily cleaved. Toluenesulfonate esters are useful for the application as alkylating agents in organic synthesis. p-Toluenesulfonic acid is used as a non-oxidizing catalyst in the manufacture of plasticizers. It is used as a curing agent for epoxy-phenolic resins. Toluene sulfonic acids are used in preparing hydrazine based blowing agents such as p-Toluenesulfonylhydrazide, p,p'-Oxybis(benzenesulfonylhydrazide), p-Toluenesulfonyl acetone hydrazone. Toluene sulfonic acids and their derivatives are used as intermediates for the synthesis of isocyanate compounds used as water scavengers and catalysts for the production of thermosetting resins. They are synthetic intermediates for a number of biologically active compounds, pharmaceuticals, herbicides, dyes and pigments candidates.

Toluene sulfonic acids are used in the production of toluenesulfonamide which has been used as the parent material for the production of saccharin. Toluenesulfonate esters are useful for the application as alkylating agents in organic synthesis. p-Toluenesulfonic acid is used as a non-oxidizing catalyst in the manufacture of plasticizers. It is used as a curing agent for epoxy-phenolic resins. Toluene sulfonic acids are used in preparing hydrazine based blowing agents such as p-Toluenesulfonylhydrazide, p,p'-Oxybis(benzenesulfonylhydrazide), p-Toluenesulfonyl acetone hydrazone. Toluene sulfonic acids and their derivatives are used as intermediates for the synthesis of isocyanate compounds used as water scavengers and catalysts for the production of thermosetting resins. They are synthetic intermediates for a number of biologically active compounds, pharmaceuticals, herbicides, dyes and pigments candidates. p-Toluene sulfonic acid is often used as a catalyst in the formation of acetal which water must be removed from the reaction mixture to escape reversible reaction. Water is removed azeotropically by distillation. (Toluene is the solvent).

o-Toluenesulfonamide has been the parent material for the production of saccharin. In the phase of either solid or liquid, large amount of toluenesulfonamide class substances including the mixtures of N-ethyl-o/p-toluene sulfonamides, N-methyl-o/p-toluene sulfonamides and o/p-toluene sulfonamides are used as flow-promoting agents for paints, adhesives, nitrocellulose, coating materials and as plasticizers for polyamides and other thermosetting resins to increase flexibility. They promote the resistance to oils, greases, and solvents. They are used as antistatic agents and as gloss enhancers in plastic film preparations. They are used as basic material of electroplating solutions. Toluenesulfonamides, or derivatives thereof, are used as intermediate for a number of organic synthesis for the field of pharmaceuticals, pesticides, dyes, pigments, fluorescent brighteners, resins, and other organic target compound preparations. P-toluenesulphonamide is

used as the precursor of nitrogen-containing crown ethers as designated for the 1,7-dioxa-4,10-diazacyclododecane ring system. The use of p-toluenesulphonamide as a derivative of ammonia activated to alkylation by alkyl halides is exemplified by the synthesis of N-tosyl-2,3-dihydroisoindole from o-xylene dibromide.

#### SALES SPECIFICATION

APPEARANCE	White crystalline powder
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ASSAY	99.0% min
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FREE ACID	0.1% max
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MOISTURE	0.05% max
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ISOMER IMPURITY	0.2% max
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MELTING POINT	67 C min
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#### TRANSPORTATION

PACKING	50kgs in drum, 12mts in container
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HAZARD CLASS	Not regulated
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#### OTHER INFORMATION

Hazard Symbols: C, Risk Phrases: 20/34, Safety Phrases: 7/8/26

#### PRICE INFORMATION

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