Material Safety Data Sheet
p-Toluenesulfonyl chloride

MSDS# 75732

Section 1 - Chemical Product and Company Identification

MSDS Name: p-Toluenesulfonyl chloride
Catalog Numbers: AC139030000, AC139030020, AC139031000, AC139035000, AC220540000, AC220540100
Synonyms: Toluene-4-sulfonyl chloride; Tosyl chloride.

Company Identification:
Acros Organics BVBA
Janssen Pharmaceuticaal 3a
2440 Geel, Belgium

Company Identification: (USA)
Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call: 800-ACROS-01
For information in Europe, call: +32 14 57 52 11
Emergency Number, Europe: +32 14 57 52 99
Emergency Number US: 201-796-7100
CHEMTREC Phone Number, US: 800-424-9300
CHEMTREC Phone Number, Europe: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#: 98-59-9
Chemical Name: p-Toluenesulfonyl chloride
%: >99
EINECS#: 202-684-8

Hazard Symbols: C
Risk Phrases: 29 34

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! Causes burns by all exposure routes. Contact with water liberates toxic gas. Target Organs: Respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns. Lachrymator (substance which increases the flow of tears).
Skin: Causes skin burns. This material is a vesicant, that is, it will induce blistering.
Ingestion: Causes gastrointestinal tract burns.
Inhalation: Causes chemical burns to the respiratory tract.

Chronic exposure may cause effects similar to those of acute exposure. Repeated exposure to low concentrations of HCl vapor or mist may cause bleeding of nose and gums. Chronic bronchitis and gastritis have also been reported.

Section 4 - First Aid Measures
Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use carbon dioxide or dry chemical. DO NOT USE WATER OR FOAM.

Autoignition Temperature: Not available.

Flash Point: 128 deg C (262.40 deg F)

Explosion Limits: Lower: Not available
Explosion Limits: Upper: Not available

NFPA Rating: ; Special Hazard: -W-

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not get water on spilled substances or inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Do not allow contact with water.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Corrosives area. Do not store in metal containers.

Section 8 - Exposure Controls, Personal Protection

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-Toluenesulfonyl chloride</td>
<td>None listed</td>
<td>None listed</td>
<td>None listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: p-Toluenesulfonyl chloride: None listed

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder
Color: white
Odor: characteristic odor
pH: Not available
Vapor Pressure: 1 mm Hg @ 88 deg C
Vapor Density: Not available
Evaporation Rate: Not available
Viscosity: Not available
Boiling Point: 134 deg C @ 10 mmHg (273.20°F)
Freezing/Melting Point: 67 - 69 deg C
Decomposition Temperature:
Solubility in water: Hydrolysis.
Specific Gravity/Density: 1.49 g/cm3
Molecular Formula: C7H7ClO2S
Molecular Weight: 190.64

Section 10 - Stability and Reactivity

Chemical Stability: Reacts with water to form corresponding acid. Material hydrolyzes in contact with moisture/water releasing toxic and corrosive fumes of hydrogen chloride and aqueous hydrochloric acid.

Conditions to Avoid: Incompatible materials, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Water, strong oxidizing agents, strong bases.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide, sulfur oxides (SOx), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#: CAS# 98-59-9: None listed
LD50/LC50: RTECS: Not available.
Carcinogenicity: p-Toluenesulfonyl chloride - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other: The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.
Hazard Class: 8
UN Number: UN3096
Packing Group: II
Canada TDG
Shipping Name: CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.
Hazard Class: 8
UN Number: UN3096
Packing Group: II

Section 15 - Regulatory Information
European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols: C
Risk Phrases:
  R 29 Contact with water liberates toxic gas.
  R 34 Causes burns.
Safety Phrases:
  S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
  S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
  S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 98-59-9: 1

Canada
CAS# 98-59-9 is listed on Canada's DSL List
Canadian WHMIS Classifications: E, F
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
CAS# 98-59-9 is not listed on Canada's Ingredient Disclosure List.

US Federal
TSCA
CAS# 98-59-9 is listed on the TSCA Inventory.

Section 16 - Other Information
MSDS Creation Date: 12/02/1997
Revision #5 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.