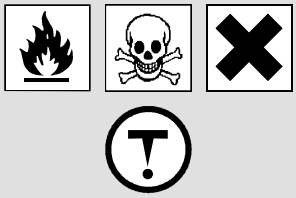
TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Flammable material; avoid heat and sources of ignition.** **Toxic compound, do not ingest or inhale. Avoid all contact with this material.** **Irritating to skin, eyes, and the respiratory system.** **DO NOT EMPTY INTO DRAINS.** **Hygroscopic -- keep container tightly sealed.** **Handle and store under nitrogen.** **Tumorigenic material.**	

Section I. Chemical Product and Company Identification

Chemical Name: **Ethyl Cellulose**
[18-22cps; 5% in Toluene+Ethanol (80:20) at 25deg C]

Catalog Number	E0072
Synonym	Not available.
Chemical Formula	Not available.
CAS Number	9004-57-3 108-88-3 (Toluene). 64-17-5 (Ethanol).

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call: **Chemtrec®**
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Ethyl Cellulose [18-22cps; 5% in Toluene+Ethanol (80:20) at 25deg C]	9004-57-3 108-88-3 (Toluene). 64-17-5 (Ethanol).	Min. 5.0 (Ethyl Cellulose) Max 80.0 (Toluene) Max 20.0 (Ethanol)	Not available.	Rat LD_{50} (oral) >5gm/kg Rabbit LD_{50} (dermal) >5gm/kg Toluene Rat LD_{50} (inhalation) 49gm/m^3/4H Rat LD_{50} (oral) 636mg/kg Rabbit LD_{50} (dermal) 14100µl/kg Ethanol Rat LD_{50} (inhalation) 20000ppm/10H Rat LD_{50} (dermal) 7060mg/kg Rabbit LD_{50} (oral) 6300mg/kg

Section III. Hazards Identification

Acute Health Effects

Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.
Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Tumorigenic Effects:
Ethanol
Mouse TDLo (Oral)320 mg/kg/50 weeks, intermittent.
Toxic Effects:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria.
Liver - Tumors.
Blood - Lymphomas including Hodgkin's disease.
Mouse TDLo (Rectal) 120 gm/kg/18 weeks, intermittent.
Toxic Effects:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria.
Gastrointestinal - Tumors.
Liver - Tumors.
DEVELOPMENTAL TOXICITY:Reproductive Effects:
Toluene
Rat TCLo (Inhalation) 1200 ppm/6 hours, female 9-12 days of pregnancy.
Toxic Effects:
Effects on Newborn - Delayed effects.
Rat TDLo (oral) 9100 mg/kg, female 6-19 days of pregnancy.
Toxic Effects:
Effects on Newborn - Growth statistics.
Effects on Newborn - Biochemical and metabolic.
Rabbit TCLo (Inhalation) 1gm/m^3/24 hours, female 7-20 days of pregnancy.
Toxic Effects:
Effects on Fertility - Abortion.
Ethanol

Continued on Next Page **Emergency phone number (800) 424-9300**

Woman TDLo (Oral) 41 gm/kg, female 41 weeks of pregnancy.
Toxic Effects:
Effects on Newborn - Apgar score (human only)
Effects on Newborn - Other neonatal measures or effects.
Effects on Newborn - Drug dependance.
Rat TDLo (Intraperitoneal) 600 mg/kg, female 8-15 days of pregnancy.
Effects on Fertility - post-implantation mortality.
Effects on Embryo or Fetus - Extra embryonic structures.
Effects onEmbryo or Fetus - Fetotoxicity.
Rabbit TDLo (Oral) 3750 mg/kg, female 1 day prior to mating.
Toxic Effects:
Effects on Fertility - Other effects of fertility.
Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability	Flammable.	Auto-Ignition	Not available.
Flash Points	4.44°C (Toluene) 16.66°C (Ethanol)	Flammable Limits	Not available.
Combustion Products	These products include toxic carbon oxides (CO,CO_2).		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions	Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Flammable liquid. Toxic material. Irritating material. Do not empty material into drains. Hygroscopic material. Handle and store under nitrogen. Tumorigenic material. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information	FLAMMABLE. TOXIC. IRRITANT. DO NOT EMPTY INTO DRAINS. HYGROSCOPIC. HANDLE AND STORE UNDER NITROGEN. TUMORIGENIC. Keep locked up.. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. DO NOT ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	Not available.

Continued on Next Page **Emergency phone number (800) 424-9300**

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid.	Solubility	Toluene Very slightly soluble in water. Miscible with alcohol, chloroform, ether, acetone, glacial acetic acid, carbon disulfide. Ethanol Miscible with water and many organic liquids.
Specific Gravity	1.14 (water=1) 0.865 (Toluene) 0.794 (Ethanol)		
Molecular Weight	92.14 (Toluene) 46.07 (Ethanol)	Partition Coefficient	Not available.
Boiling Point	110-111°C (Toluene) 78°C (Ethanol)	Vapor Pressure	22mm Hg @ 20°C (Toluene) 59.3mm Hg @ 20°C (Ethanol)
Melting Point	240 to 255°C (464 to 491°F) -93°C (Toluene) -114°C (Ethanol)	Vapor Density	3.2 (Toluene) 1.59 (Ethanol) (Air = 1)
Refractive Index	1.4967 @ 20°C (Toluene) 1.361 @ 20°C (Ethanol)	Volatility	Not available.
Critical Temperature	Not available.	Odor	Sweetish.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents, peroxides, alkali metals, ammonia.

Section XI. Toxicological Information

RTECS Number

FJ5950500
XS5250000 (Toluene)
KQ6300000 (Ethanol)

Routes of Exposure

Eye Contact. Ingestion. inhalation.

Toxicity Data

Rat LD_{50} (oral) >5gm/kg
Rabbit LD_{50} (dermal) >5gm/kg
Toluene
Rat LD_{50} (inhalation) 49gm/m^3/4H
Rat LD_{50} (oral) 636mg/kg
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Chronic Toxic Effects

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Rat TDLo (oral) 9100 mg/kg, female 6-19 days of pregnancy.
Toxic Effects:
Effects on Newborn - Growth statistics.
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Rabbit TCLo (Inhalation) 1gm/m^3/24 hours, female 7-20 days of pregnancy.
Toxic Effects:
Effects on Fertility - Abortion.
Ethanol
Woman TDLo (Oral) 41 gm/kg, female 41 weeks of pregnancy.
Toxic Effects:
Effects on Newborn - Apgar score (human only)

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Effects on Newborn - Other neonatal measures or effects.
Effects on Newborn - Drug dependance.
Rat TDLo (Intraperitoneal) 600 mg/kg, female 8-15 days of pregnancy.
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Section XII. Ecological Information

Ecotoxicity

Not available.

Environmental Fate

Toluene

Toluene is released into the atmosphere principally from the volatilization of petroleum fuels and toluene-based solvents and thinners and from motor vehicle exhaust. Toluene's production and use as an intermediate in the production of benzoic acid, benzaldehyde, benzene, explosives, dyes and many other organic compounds may also result in its release to the environment through various waste streams. Toluene has been detected in emissions from volcanos, forest fires and crude oil. If released to air, a vapor pressure of 28.4 mm Hg at 25 deg C indicates toluene will exist solely as a vapor in the ambient atmosphere. Vapor-phase toluene will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 3 days. Toluene may also be degraded in the atmosphere by reaction with nitrate radicals and ozone molecules, but these reactions are too slow to be environmentally important. If released to soil, toluene is expected to have high to moderate mobility based upon Koc values in the range of 37-178. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 6.64X10-3 atm-cu m/mole. Toluene may volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation is expected to occur rapidly in soil surfaces, with half-lives in the range of several hours to 71 days. If released into water, toluene is not expected to adsorb to suspended solids and sediment based upon a Koc of 166 measured in lake sediment. Biodegradation is expected to occur rapidly in water, with reported half-lives of 4 and 56 days in aerobic and anaerobic water, respectively. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 1 hour and 4 days, respectively. Measured BCF values of 13 and 90 in fish suggest bioconcentration in aquatic organisms is low to moderate. Hydrolysis is not expected to be an important environmental fate process for toluene due to lack of hydrolyzable functional groups. Exposure to toluene may occur occupationally during its production or subsequent use, particularly as a solvent or in gasoline, via dermal and respiratory routes. The main route of exposure for the general population will be through inhalation from contaminated air and handling of gasoline as well as ingestion of contaminated drinking water and food, and exposure to some consumer products.

Ethanol

Ethanol will enter the environment as emissions from its manufacture, use as a solvent and chemical intermediate, and release in fermentation and alcoholic beverage preparation. It naturally occurs as a plant volatile, microbial degradation product of animal wastes, and in natural fermentation of carbohydrates. When spilled on land it is apt to volatilize, biodegrade, and leach into the ground water, but no data on the rates of these processes could be found. Its fate in ground water is unknown. When released into water it will volatilize and probably biodegrade. It would not be expected to adsorb to sediment or bioconcentrate in fish. Although no data on its biodegradation in natural waters could be found, laboratory tests suggest that it may readily biodegrade and its detection in water systems may be due in part to its extensive use in industry with possible relatively steady and large levels of discharges. When released to the atmosphere it will photodegrade in hours (polluted urban atmosphere) to an estimated range of 4 to 6 days in less polluted areas. Rainout should be significant. Human exposure will be primarily in occupational atmospheres and consumption of products containing ethanol. Exposure will also occur from other contaminated atmospheres especially in proximity to industries and cities, and ingestion of contaminated drinking water, as well as proximity to sources of natural release.

Section XIII. Disposal Considerations

Waste Disposal

Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

Section XIV. Transport Information

DOT Classification

CLASS 3: Flammable liquid.
CLASS 6.1: Poisonous material.

PIN Number

UN1992

Proper Shipping Name

Flammable liquid, toxic, n.o.s.

Packing Group (PG)

II

DOT Pictograms

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Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list. This product is or contains a component subject to SARA section 313 reporting requirements.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).
EINECS Number (EEC)	232-674-9 203-625-9 (Toluene) 200-578-6 (Ethanol)
EEC Risk Statements	R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R46- May cause heritable genetic damage. R47- May cause birth defects.
Japanese Regulatory Data	Not available.

Section XVI. Other Information

Version 1.0
Validated on 8/5/2002.
Printed 2/15/2005.

Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.