TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Flammable material; avoid heat and sources of ignition.** **Harmful compound, minimize exposure.** **Irritating to skin, eyes, and the respiratory system.** **Hygroscopic -- keep container tightly sealed.** **MUTAGEN. MINIMIZE EXPOSURE.** **POSSIBLE CARCINOGEN. MINIMIZE EXPOSURE.**	

Section I. Chemical Product and Company Identification

Chemical Name: **Methyl Red - Methylene Blue Solution (Ethanol Soln.)**
[mixed Indicator]

Catalog Number: M0161

Synonym: Methylene Blue - Methyl Red Solution

Chemical Formula:

CAS Number: 493-52-7 (Methyl Red)
61-73-4 (Methylene Blue)
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
Methyl Red - Methylene Blue Solution (Ethanol Soln.) [mixed Indicator]	493-52-7 (Methyl Red) 61-73-4 (Methylene Blue) 64-17-5 (Ethanol)	Not available.	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.	(Methylene Blue) Rat LD_{50} (oral) 1180 mg/kg Rat LD_{50} (intraperitoneal) 180 mg/kg Rat LD_{50} (intravenous) 190 mg/kg (Ethanol) Rat LD_{50} (oral) 7060 mg/kg Mouse LD_{50} (oral) 3450 mg/kg Rat LD_{50} (inhalation) 20000 ppm/10H

Section III. Hazards Identification

Acute Health Effects

Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury 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.
(Methyl Red)
Rat TDLo Oral 12 gm/kg for 57 weeks continuous
TOXIC EFFECTS:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Liver - Tumors
(Ethanol)
Mouse TD Oral 400 gm/kg for 57 weeks intermittent
TOXIC EFFECTS:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Gastrointestinal - Tumors
Mouse TDLo Oral 320 mg/kg for 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 for 18 weeks intermittent
TOXIC EFFECTS:
Tumorigenic - Equivocal tumorigenic agent by RTECS criteria
Gastrointestinal - Tumors
Liver - Tumors
DEVELOPMENTAL TOXICITY: Reproductive effects.
(Methylene Blue)
Rat TDLo Oral 2500 m/kg, female 1-22 days of pregnancy
TOXIC EFFECTS:
Effects on Fertility - Post-implantation mortality
Mouse TDLo Subcutaneous 35 mg/kg, female 8 days of pregnancy
TOXIC EFFECTS:
Specific Developmental Abnormalities - Musculoskeletal system
Specific Developmental Abnormalities - Urogenital system
Mouse TDLo Subcutaneous 50 mg/kg, female 8 days of pregnancy
TOXIC EFFECTS:
Effects on Embryo or Fetus - Fetotoxicity
Specific Developmental Abnormalities - Craniofacial

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

(Ethanol)
Rat TDLo Intraperitoneal 600 mg/kg, female 8-15 days of pregnancy
TOXIC EFFECTS:
Effects on Fertility - Post-implantation mortality
Effects on Embryo or Fetus - Extra embryonic structures
Effects on Embryo or Fetus - Fetotoxicity
Rat TDLo Oral 135 gm/kg, female 1 day of pregnancy to 7 days after birth
TOXIC EFFECTS:
Effects on Newborn - Behavioral
Effects on Newborn - Physical
Rat TDLo Oral 47 mg/kg, female 1-21 days of pregnancy
TOXIC EFFECTS:
Specific Developmental Abnormalities - Endocrine system
Effects on Newborn - Delayed effects
Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.

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. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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
363°C (685.4°F) (Ethanol)

Flash Points
13 to 17°C (55.4 to 62.6°F).

Flammable Limits
LOWER: 3.3% UPPER: 19% (Ethanol)

Combustion Products
These products are toxic carbon oxides (CO, CO_2), nitrogen oxides (NO, NO_2), sulfur oxides (SO_2, SO_3...), halogenated compounds.
WARNING: Highly toxic HCl gas is produced during combustion.

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.
Consult with local fire authorities before attempting large scale fire-fighting operations.

Section VI. Accidental Release Measures

Spill Cleanup Instructions
Flammable material. Harmful material. Irritating material. Hygroscopic material. Mutagenic material. Possibly carcinogenic 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 touch spilled material. 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. HARMFUL. IRRITANT. HYGROSCOPIC. MUTAGEN. POSSIBLE CARCINOGEN. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray.
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. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

Exposure Limits
This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.
This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.

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Section IX. Physical and Chemical Properties

Physical state @ 20°C	Liquid. (Dark green.)	Solubility	Not available.
Specific Gravity	0.99 (water=1) (Methyl Red) 0.79 (water=1) (Ethanol)		
Molecular Weight	$C_{15}H_{15}N_3O_2$ = 269.30 (Methyl Red) $C_{16}H_{18}ClN_3S$ = 391.85 (Methylene Blue) C_2H_6O = 46.07 (Ethanol)	Partition Coefficient	LOG P_{ow}: -0.32 (Ethanol)
Boiling Point	79°C (174.2°F) (Ethanol)	Vapor Pressure	5.8 kPa (@ 20°C) (Ethanol)
Melting Point	182°C (359.6°F) (Methyl Red)	Vapor Density	1.6 (Air = 1) (Ethanol)
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Characteristic.
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. Hygroscopic; keep container tightly closed.
Incompatibilities	Reactive with oxidizing agents, acids, peroxides, alkali metals, ammonia.

Section XI. Toxicological Information

RTECS Number

DG8960000 (Methyl Red)
SO5600000 (Methylene Blue)
KQ6300000 (Ethanol)

Routes of Exposure

Eye Contact. Ingestion. Inhalation.

Toxicity Data

(Methylene Blue)
Rat LD_{50} (oral) 1180 mg/kg
Rat LD_{50} (intraperitoneal) 180 mg/kg
Rat LD_{50} (intravenous) 190 mg/kg
(Ethanol)
Rat LD_{50} (oral) 7060 mg/kg
Mouse LD_{50} (oral) 3450 mg/kg
Rat LD_{50} (inhalation) 20000 ppm/10H
Not available.

Chronic Toxic Effects

CARCINOGENIC EFFECTS : Not available.
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Effects on Embryo or Fetus - Fetotoxicity
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Acute Toxic Effects

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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.

Section XII. Ecological Information

Ecotoxicity

Not available.

Environmental Fate

(Methylene Blue)
Methylene blueis used as both the zinc-free product and the zinc chloride double salt. Its principal use is in dyeing paper. Some small amounts are used in leather dyeing and as a polymerization inhibitor in some monomeric organics. Smaller quantities of the zinc-free type are used medicinally and as an injectable solution to combat cyanosis. These and other uses along with its production may result in its release to the environment through various waste streams. Aqueous waste effluents are generated at manufacturing sites where azine and thioazine dyes (such as methylene blue) are produced. Losses of dyes (in general) to wastewater effluents during manufacture have been estimated to be 1-2%. For the organic dye industry in general, it has been estimated that as much as 10% of the dye is lost to wastewater effluents during dyeing operations. If released to soil, methylene blue would be estimated to have very high mobility based upon its high water solubility. However, laboratory adsorption studies determined that methylene blue was strongly adsorbed to three different soils. Volatilization of methylene blue will not be important from moist or dry soil surfaces. Insufficient data are available to determine the rate or importance of biodegradation of methylene blue in soil or water. If released to water, methylene blue would adsorb to suspended solids and sediment based upon soil adsorption studies. Methylene blue will be essentially non-volatile from water surfaces. An estimated BCF value of 1.5 suggests that methylene blue will not bioconcentrate in aquatic organisms. Methylene blue does not contain any functional groups that are expected to hydrolyze in water. If released to the atmosphere methylene blue will exist as both vapor and particulate in the ambient atmosphere. Vapor-phase methylene blue is degraded in the atmosphere by reaction with photochemically produced hydroxyl radicals with an estimated half-life of about 1.9 hours. Direct photolysis in the environment may also be possible. Particulate-phase methylene blue may be physically removed from the air by wet and dry deposition. Occupational exposure may occur through dermal contact or inhalation of dusts at sites where methylene blue is manufactured or used. The general population may be exposed to methylene blue through dermal contact with products which have been dyed with the compound and through ingestion of medicines containing methylene blue.
(Ethanol)
Ethanol's production and use in alcoholic beverages, as a solvent, fuel additive, in the manufacture of denatured alcohol, pharmaceuticals (rubbing compounds, tonics, lotions, colognes), in perfumery, and organic synthesis may result in its release to the environment through various waste streams; it's use as a fungicide and plant regulator will result in its direct release to the environment. Ethanol has been identified as a natural emission product from various plants, fermentation product and as a biological decomposition product of wastes and sewage. If released to the atmosphere, an extrapolated vapor pressure of 59.3 mm Hg at 25 deg C indicates that ethanol will exist solely in the vapor phase. Vapor phase ethanol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 5 days. If released to soil, ethanol is expected to have very high mobility based upon an estimated Koc of 1. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 5X10-6 atm-cu m/mole. Ethanol may also volatilize from dry soils based upon it vapor pressure. Biodegradation is expected to occur rapidly in the environment based on numerous screening tests using different types of inocula and incubation periods. Ethanol was degraded with half-lives on the order of a few days using microcosms constructed with a low organic sandy soil and groundwater, indicating it is unlikely to be persistent in the environment. If released into water, ethanol is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. 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 3 and 39 days, respectively. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis of ethanol and photolysis in sunlit surface waters are not expected since ethanol lacks functional groups that are susceptible to hydrolysis or photolysis under environmental conditions. Occupational exposure to ethanol may occur through inhalation and dermal contact with this compound at workplaces where ethanol is produced or used. The general population is directly exposed to ethanol through the consumption of alcoholic beverages and other products that contain ethanol. Monitoring data also indicate that the general population may be exposed to ethanol via inhalation of ambient air.

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

DOT CLASS 3: Flammable liquid.

PIN Number

UN1170

Proper Shipping Name

Ethanol solution

Packing Group (PG)

II

DOT Pictograms

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

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8℃ (100℉). On DSL.
EINECS Number (EEC)	207-776-1 (Methyl Red) 200-515-2 (Methylene Blue) 200-576-6 (Ethanol)
EEC Risk Statements	R11- Highly flammable. R18- In use, may form flammable/explosive vapor-air mixture. R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. R45- May cause cancer. R46- May cause heritable genetic damage. R47- May cause birth defects.
Japanese Regulatory Data	ENCS No. 5-243 (Methyl Red) ENCS No. 5-1995 (Methylene Blue) ENCS No. 2-202 (Ethanol)

Section XVI. Other Information

Version 1.0
Validated on 9/3/2009.
Printed 9/3/2009.

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.