Material Safety Data Sheet

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Version 1.2
According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	TRIMETHYL PHOSPHATE, 99+%
Product Number	241024
Company	Sigma-Aldrich Pty, Ltd Unit 2, 14 Anella Avenue Castle Hill NSW 1765 Australia
Technical Phone #	+61 2 9841 0555
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
TRIMETHYL PHOSPHATE	512-56-1	208-144-8	None

Formula	C3H9O4P
Molecular Weight	140.08 AMU
Synonyms	Methyl phosphate * NCI-C03781 * Trimethoxyphosphine oxide * Trimethylfosfat (Czech) * Trimethyl orthophosphate * Trimethyl phosphate * O,O,O-Trimethyl phosphate

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
May cause heritable genetic damage. Also harmful if swallowed. Limited evidence of a carcinogenic effect.

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

AFTER SKIN CONTACT
In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is

conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS
Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

METHODS FOR CLEANING UP
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Wash thoroughly after handling.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory Protection: Government approved respirator in nonventilated areas and/or for exposure above the TLV or PEL.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless

Property	Value	At Temperature or Pressure

pH	N/A	
BP/BP Range	192 - 194 °C	
MP/MP Range	-46 °C	
Flash Point	150 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	1.213 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Phosphorous oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: TC8225000

ACUTE TOXICITY

LD50
Oral
Rat
840 mg/kg

LD50
Oral
Mouse
1470 mg/kg

LD50
Intraperitoneal
Mouse
2250 MG/KG

LD50
Oral
Rabbit

1275 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Muscle weakness. Lungs, Thorax, or Respiration:Dyspnea.

LD50
Skin
Rabbit
2830 UL/KG

LD50
Oral
Guinea pig
1676 mg/kg

LD50
Oral
Quail
750 mg/kg

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: May be harmful if inhaled. Vapor or mist is irritating to the mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION
Central nervous system.

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and Appendages: Other: Tumors.

Mouse
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Tumorigenic Effects: Uterine tumors

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

CHRONIC EXPOSURE - MUTAGEN
Result: May alter genetic material.

Human
100 MMOL/L
5H
Cell Type: lymphocyte
Cytogenetic analysis

Rat
300 UMOL/L
Cell Type: liver
DNA damage

Rat
500 MG/KG
Intraperitoneal
24H
Cytogenetic analysis

Mouse
2500 MG/KG
Intraperitoneal
5D
Micronucleus test

Mouse
1750 MG/KG
Cell Type: S. typhimurium
Body fluid assay

Mouse
1250 MG/KG
Unreported
Cytogenetic analysis

Mouse
1 GM/KG
Intraperitoneal
Cytogenetic analysis

Mouse
2500 MG/KG
Oral
5D
Dominant lethal test

Mouse
200 MG/KG
Parenteral
Dominant lethal test

Mouse
1 MG/KG
Intraperitoneal
Dominant lethal test

Mouse
1500 MG/KG
Cell Type: E. coli
Host-mediated assay

Mouse
3500 MG/KG
Intraperitoneal

5D
sperm

Mouse
21728 MG/KG
Oral
8W
Heritable translocation test

Mouse
1 GM/KG
Intraperitoneal
Heritable translocation test

Hamster
1 GM/KG
Oral
5D
Cytogenetic analysis

Chicken
25424 UG/KG
Parenteral
Sister chromatid exchange

CHRONIC EXPOSURE - TERATOGEN

Species: Mouse
Dose: 2500 MG/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Embryo or Fetus: Fetal death.

Species: Mouse
Dose: 1 GM/KG
Route of Application: Intraperitoneal
Exposure Time: (1D MALE)
Result: Effects on Embryo or Fetus: Fetal death.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: May cause reproductive disorders.

Species: Rat
Dose: 1 GM/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

Species: Rat
Dose: 500 MG/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Rat
Dose: 600 MG/KG
Route of Application: Oral
Exposure Time: (1D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic

material, sperm morphology,motility, and count).

Species: Rat
Dose: 5500 MG/KG
Route of Application: Oral
Exposure Time: (22D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count). Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Mouse
Dose: 2500 MG/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 5 GM/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Mouse
Dose: 700 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (1D MALE)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 1 GM/KG
Route of Application: Intraperitoneal
Exposure Time: (1D MALE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Hamster
Dose: 1 GM/KG
Route of Application: Oral
Exposure Time: (2D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

CMR CAT.: Carc. Cat.3

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR
Non-hazardous for road transport.

IMDG
Non-hazardous for sea transport.

IATA
Non-hazardous for air transport.

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
INDICATION OF DANGER: T
Toxic.
R-PHRASES: 46 22 40
May cause heritable genetic damage. Also harmful if swallowed. Limited evidence of a carcinogenic effect.
S-PHRASES: 53 36/37 45
Avoid exposure - obtain special instructions before use. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany
WGK: 1

SWITZERLAND
SWISS POISON CLASS: 4

16 - Other Information

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

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