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MATERIAL SAFETY DATA SHEET

MSDS # PMC/RC/013/06

Updated on 02-Jan-2006
Product Name ACCICURE TMT
Revision Number +REV04
UN Number 3077
CAS No. 137-26-8

Health Hazard :	2
Fire Hazard :	1
Reactivity :	0
Personal Protection :	X

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME : ACCICURE TMT

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2. COMPOSITION/INFORMATION ON INGREDIENTS

PRODUCT DESCRIPTION : Tetramethyl thiuram disulphide; TMTD

HAZARDOUS INGREDIENT(S)	CAS No	Symbol	R&S Phrases
Tetramethyl thiuram disulphide (97-99 %)	137-26-8	Xn, N	R20/22, R36/38 R43, R48, R50/53

3. HAZARDS IDENTIFICATION

Possible risk of irreversible effects.
Harmful by inhalation and if swallowed.
Irritating to eyes, respiratory system and skin
May cause sensitisation by skin contact.
Category 3 mutagen (EU)
Substance which causes concern for man owing to possible mutagenic effects
In common with many organic compounds in powder form it can produce flammable dust clouds in air.

4. FIRST-AID MEASURES

- Inhalation Remove patient from exposure, keep warm and at rest.
Seek medical advice.
- Skin Contact Remove contaminated clothing. Wash immediately with copious amounts of soap and water.
If symptoms (irritation or blistering) occur obtain medical attention.
Contaminated clothing should be laundered before re-use.
- Eye Contact Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain medical attention.
- Ingestion If swallowed, seek immediate medical assistance.
Under no circumstances give any form of alcohol
See; **OTHER INFORMATION**
- Do not induce vomiting.
Wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Obtain immediate medical attention.
- Further Medical Treatment**
See; **OTHER INFORMATION**

5. FIRE-FIGHTING MEASURES

- Combustible.
In common with many organic compounds in powder form it can produce flammable dust clouds in air. Protect from sparks (dust explosion risk)
- Combustion or thermal decomposition will evolve very toxic, irritant and extremely flammable vapours. Combustion products sulphur oxides, carbon monoxide, carbon dioxide and carbon disulphide.
- Extinguishing Media water spray, foam, dry powder or CO₂. Do not use water jet. (Avoid dust generation.)
- Fire Fighting & Protective Equipment : A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions

6. ACCIDENTAL RELEASE MEASURES

Do not allow to enter drains, sewers or watercourses.
Control dust formation. (See 'Fire fighting measures'.)
Collect spillages by mechanical means.
Transfer to a container for disposal or recovery.
Ensure suitable personal protection during removal of spillages.
Use appropriate containment to avoid environmental contamination.

Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

7. HANDLING AND STORAGE

7.1 HANDLING

Control dust formation. (See 'Fire fighting measures'.)
Avoid contact with skin and eyes.
Avoid inhalation of high concentrations of dusts. Atmospheric levels should be controlled in compliance with the occupational exposure limit.

7.2 STORAGE

In common with many organic compounds in powder form it can produce flammable dust clouds in air. Take precautionary measures against static discharges. Keep away from oxidising agents, acids, alkalis, moisture, heat and direct sunlight.

Suitable containers : High density polyethylene (HDPE) laminated paper bags with polythene liner inside.

Storage Temperature : ambient.
Storage Life : 1 year(s)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Wear suitable gloves (PVC or rubber) and eye/face protection.
Wear suitable respiratory protective equipment if exposure to levels above the occupational exposure limit is likely.

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Occupational Exposure Limits

HAZARDOUS INGREDIENT(S)	LTEL 8hr TWA		STEL		Notes
	ppm	mg/m ³	ppm	mg/m ³	
Thiram	-	5	-	10	EH40 2001

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Powder /pellets, non-staining
Colour	Off-white
Odour	Characteristic (mild amine)
Boiling Point (Deg C)	No data.
Melting Point (Deg C)	140 (approx)
Flash Point (Deg C)	138 (open cup)
Flammable Limits	No data.
Auto Ignition	
Temperature (Deg C)	No data.
Explosive Properties	In common with many organic compounds in powder form it can produce flammable dust clouds in air.
Oxidising Properties	No data.
Vapour Pressure (Ps)	<0.001 at 20 Deg C
Density (g/ml)	1.20 at 20 Deg C
Solubility (Water)	Insoluble
Solubility (Other)	Soluble in acetone and chloroform,
Partition Coefficient	1.82 log P
Specific Gravity	1.42
Molecular Weight	240.44
Molecular Formula	C6-H12-N2-S4

10. STABILITY AND REACTIVITY

Chemical Stability : Stable at ambient temperatures in closed, original container. Stable under normal conditions of handling, use and transportation.

Incompatible materials oxidising agents, acids, alkalis and nitrosating agents for example. nitrites, nitrates and nitrogen oxides.

Hazardous Polymerisation: Will not occur.

Hazardous Decomposition Product(s) : Carbon monoxide, Oxides of nitrogen, Oxides of Sulphur

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Solid with low volatility.

The substance is sparingly soluble in water.

The substance has low potential for bioaccumulation.

Persistence and Degradation

The substance is substantially biodegradable.

There is evidence of photodegradation in water.

Toxicity

Very toxic to aquatic organisms.

Acute Fish Toxicity :

LC50 (Guppy) (96 hour) 0.27mg/l (semi-static)

LC50 (Rainbow Trout) (96 hour) (static) 0.16mg/l

LC50 (Bluegill Sunfish) (96 hour) 0.13 mg/l

EC50 (Daphnia Magna) (48 hour) 0.21 mg/l

IC0 (Pseudomonas Putida) >200 mg/l

Octanol/Water Coefficient : 1.82 log P

Chemical Fate Information : Hydrolysis half-life:100 hrs @ pH 5.7, 1100 hrs/pH 7.0

13. DISPOSAL CONSIDERATIONS

Disposal should be in accordance with local, state or national legislation.

Disposal of Container-should also be in accordance to national/local regulations.

14. TRANSPORT INFORMATION

Not Classified as Dangerous for Transport.

UN No 3077

UN Pack. Group III

UN Packing Group Air III

SEA

IMDG Class -primary 9

Marine Pollutant Classified as a Marine Pollutant

UN Packing Group Sea III

Proper Shipping Name ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
SOLID, N.O.S.(thiram)

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ROAD/RAIL

ADR/RID Class NONE

15. REGULATORY INFORMATION

EC Classification: Harmful, Hazard Symbol Xn



Dangerous for the environment, N



Risk Phrases R20/22 Harmful by inhalation and if swallowed.
R36/38 Irritating to eyes and skin.
R48 Danger of serious damage to health by prolonged exposure.
R50/53 (29 ATP) Very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

Safety Phrases S24 Avoid contact with skin.
S25 Avoid contact with the eyes
S36/37 Wear suitable protective clothing and gloves.
S60 This material and/its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/safety data sheets.

16. OTHER INFORMATION

Use : Accelerator for rubber vulcanisation

FDA Status 21 CFR: Regulated for use under section 21 CFR : 177.2600.
Rubber Articles Intended for Repeated Use in Food Contact

Special notes:

- Prolonged exposure to TMTD has been associated with the development of chronic conjunctivitis¹.
- Tests for carcinogenesis were inconclusive but TMTD reacts under nitrosating conditions to produce carcinogenic N-nitrosodimethylamine. A number of co-

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agents have been implicated in the nitrosation of the dimethylamine generated from TMTD on vulcanisation, carbon black being the focus of recent research. That adsorbed species on the carbon black can function in this way has been demonstrated², as has the possibility of moderating this effect by attention to dump temperatures³.

- TMTD, the most toxic of the thiurams, produced deaths and malformations in chicken embryos⁴. Similar effects have been reported in hamsters. It affects fertility in rats and mice⁴.
- The possibility of neurotoxic effects from exposure has been reported^{5,6}
- If absorbed into human system before or after consumption of alcohol may give rise to unpleasant side effects (e.g. nausea, vomiting, flushing, etc). Even small quantities, if absorbed by inhalation, may suffice to produce this effect^{6,7}.
- Listed by the International Contact Dermatitis Group for routine skin patch testing in appropriate circumstances.

References:

1. Sivitskaya, I. I., State of the organ of vision in persons working in contact with TMTD. *Opialmologischeskii Zeitung*, 1974; 28: 286-8.
2. Herman, J. Schuster, R.H. and Wunsch, G. Studies on nitrosamine formation in rubbers. *Gummi Fasern Kunstst.*, 1992; 45: 21-7.
3. Willoughby, B.G. and Scott, K.W. Nitrosamine formation in rubber: I. Influence of mixing history. *Rubber Chem. Technol.*, 1998; **71**: 31 O-22.
4. World Health Organisation, International Agency for Research on Cancer. IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: The Rubber Industry, Vol. 28, Lyon, France: IARC, 1982: 151-152.
5. Lee, C. C. and Peters, P. J., Neurotoxicity and behaviour effects of thiuram in rats. *Envir. Health Perspectives*, 1967; **17**: 35-43.
6. Proctor and Hughes' *Chemical Hazards of the Workplace*, 4th Edition, Ed: Hathaway, G.J., Proctor, N.H. and Hughes, J.P.: Van Nostrand Rheinhold, 1996: 600-601.
7. Shelly, W. B., Golf-course dermatitis due to thiram fungicide. *J.A.M.A.*, 1964; **188**: 415-417.

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HMIS rating: Health: 2
Flammability: 1
Reactivity: 0
PPI: X

Legend : 0(HMIS) Minimal hazard
1(HMIS) Slight hazard
2(HMIS) Moderate hazard
3(HMIS) Serious hazard
4(HMIS) Severe hazard
X(HMIS) Personal protective rating to be supplied by user
depending on the use conditions

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