CELLTECH ® TDCP FLAME RETARDANT ADDITIVE

MANUFACTURED BY/FOR: CELLULAR TECHNOLOGY INTERNATIONAL, INC.
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SUITE 118
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PRODUCT INFORMATION AND CUSTOMER SERVICE: +1 800-733-7374 / +1 678-766-0430
FOR TECHNICAL INQUIRIES: +1 678-766-0725
TRANSPORTATION EMERGENCY PHONE FOR SPILLS, LEAKS, FIRE & EXPOSURE:
NATIONAL RESPONSE CENTER: +1 800-424-8802 (24 HOURS)
CHEMTREC +1 800-424-9300 (24 HOURS)
(483-7616 IN DISTRICT OF COLUMBIA)

SECTION I - IDENTIFICATION AND HAZARD SUMMARY

TRADE NAME: CELLTECH TDCP FLAME RETARDANT
CHEMICAL NAME: Tris-(1,3-dichloropropyl) phosphate
CHEMICAL FAMILY: CHLORINATED PHOSPHATE ESTER
MOLECULAR FORMULA: C₉H₁₅Cl₆O₄P
MOLECULAR WEIGHT: 430.9
CAS NAME: Propanol, 1,3-dichloro, phosphate (3:1)
CAS NUMBER(S): 13674-87-8
HMIS CLASSIFICATION: Health: 1 Flammability: 1 Reactivity: 0 Special: -
NFPA CLASSIFICATION: Health: 1 Flammability: 1 Reactivity: 0 Special: -

SECTION II - HAZARDOUS INGREDIENTS/INFORMATION

<table>
<thead>
<tr>
<th>Material</th>
<th>CAS Number</th>
<th>Wt. %</th>
<th>OSHA PEL/ACGIH TLV/OTHER STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3-Dichloro-2-propanol phosphate (3:1)</td>
<td>13674-87-8</td>
<td>93-97%</td>
<td>None established.</td>
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</tbody>
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THIS PRODUCT IS LISTED ON THE TSCA INVENTORY AND THE CANADIAN DOMESTIC SUBSTANCE LIST (DSL). THIS PRODUCT DOES NOT CONTAIN ANY SARA TITLE III, SECTION 313 INGREDIENTS. SEE SECTION X FOR SARA TITLE III REPORTING REQUIREMENTS.

STATEMENT OF HAZARDS
HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE PRACTICES. AVOID UNNECESSARY EXPOSURE! REMOVE MATERIAL FROM EYES, SKIN AND CLOTHING. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (760 mm Hg): >220° C. (decomposes)
Pour Point: N/A
Density, lbs. per gallon: N/A
Vapor Density (air=1): N/D
Evaporation Rate (butyl acetate=1): <N/D
Odor: None
Solubility in Water: Insoluble
Viscosity (Brookfield): 1,800 cP @ 25° C.
500 cP @ 40° C.
Melting Point: >27° C.
Specific Gravity (water=1): 1.513 (20° C./4° C.)
Vapor Pressure, mm Hg: <0.1 @ 100° C.
% Volatiles: N/D
Appearance: Clear liquid
Color: Colorless
pH (10%): N/D
SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method): 224°C by SETAFLASH Closed Cup
Flammability Limits: Upper: ND Lower: ND
Auto ignition Temperature: Not determined.
Extinguishing Media: Treat fire as Class B fire; extinguish with water spray, dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Fire fighters should wear water-proof protective clothing and self-contained positive ventilation respiratory protection to prevent exposure to fumes and mists. Runoff from water-extinguished fires should be contained and not allowed to contaminate ground water.
Explosion Hazards: Evolution of toxic phosphorus oxides and corrosive hydrogen chloride at elevated temperatures.

SECTION V - REACTIVITY DATA

Stability: Stable under normal conditions.
Incompatibility (materials to avoid): Incompatible with strong oxidizers and alkalis.
Hazardous Decomposition Products: Emits toxic fumes of phosphorus oxides and hydrogen chloride at elevated temperatures.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Avoid prolonged storage at elevated temperatures under wet or acidic conditions.

SECTION VI - HEALTH HAZARD ASSESSMENT

PRIMARY ROUTE(S) OF EXPOSURE: EYE SKIN INHALATION INGESTION

Threshold Limit Value: Not determined by ACGIH or OSHA.
Ingestion: The acute oral LD-50 of this product is reported as 1,850 mg/kg (rats). In a subchronic study, daily oral doses of 25 or 250 mg/kg fed to rats for 90 days produced mortality and increased organ weights and organ to body weight ratios for liver and kidneys, but no histological changes were noted in any tissues. REPEATED INGESTION MAY RESULT IN SYMPTOMS OF CHOLINESTERASE INHIBITION.
Eye Contact: This material did not produce irritation in rabbit eyes.
Skin Contact and Absorption: The acute dermal LD-50 of the product is reported as >23,900 m/kg (rabbits). A 40% depression of RBC cholinesterase was noted at this dose level. In a subchronic study, dermal application of 1,450 mg/kg to rabbits for 90 days produced an increase in kidney weight, but no histological changes were observed in any tissues. THIS MATERIAL IS A WEAK CHOLINESTERASE INHIBITOR. SYMPTOMS MAY INCLUDE SALIVATION, SWEATING, HEADACHE, NAUSEA, MUSCLE TWITCHING, INCOORDINATION, DIARRHEA, BLURRED VISION, ABDOMINAL CRAMPS, TEARS, TREMOR AND CHEST DISCOMFORT.
Inhalation: The acute inhalation LC-50 of this product is reported to be 9.8 mg/L in rats (greater than 95% respirable aerosol). No mortality occurred during a 14 day observation period. The few signs of toxicity occurring after exposure to this very high concentration of test material disappeared by 2 hour postexposure with all treated animals appearing normal. Existing medical conditions such as asthma and pulmonary diseases, however may be aggravated by prolonged overexposure. THIS MATERIAL IS A WEAK CHOLINESTERASE INHIBITOR. SYMPTOMS MAY INCLUDE SALIVATION, SWEATING, HEADACHE, NAUSEA, MUSCLE TWITCHING, INCOORDINATION, DIARRHEA, BLURRED VISION, ABDOMINAL CRAMPS, TEARS, TREMOR AND CHEST DISCOMFORT.
Target Organs: Kidneys, liver and/or sternal bone marrow.
Neurotoxicity: No data available.
Signs and Symptoms of Overexposure: (Acute)
THIS MATERIAL IS A WEAK CHOLINESTERASE INHIBITOR. SYMPTOMS MAY INCLUDE SALIVATION, SWEATING, HEADACHE, NAUSEA, MUSCLE TWITCHING, INCOORDINATION, DIARRHEA, BLURRED VISION, ABDOMINAL CRAMPS, TEARS, TREMOR AND CHEST DISCOMFORT.

First Aid Procedures:
EYES: Flush eyes with large amounts of water for 15 minutes. CONTACT A PHYSICIAN IMMEDIATELY.
SKIN: Remove contaminated clothing. Wash with plenty of water, then wash with soap and water.
INGESTION: DO NOT INDUCE VOMITING! Dilute stomach contents with large volumes of water or milk. Never give anything by mouth to an unconscious person!
INHALATION: Remove to uncontaminated area and restore breathing if necessary. Give mechanical oxygen if necessary. CALL A PHYSICIAN.
ADDITIONAL INSTRUCTIONS: If symptoms develop, seek medical attention.
NOTE TO PHYSICIAN: Be sure to advise exposed person that this product may cause cholinesterase inhibition. If cholinesterase inhibition is suspected, atropine by injection is antidotal. 2-PAM (protopam chloride) is also antidotal when administered early and in conjunction with atropine.

Carcinogenicity: This material is NOT listed as a carcinogen by NTP, IARC Monographs or OSHA.

Teratogenic Effects: Reported not to be a teratogen. Daily doses of 25, 50, 100, 200 and 400 mg/kg were given orally to rats for 7-15 days of gestation, and its teratogenic effects examined in the fetus and offspring. No teratogenic effects under these conditions were observed. However, doses of 400 mg/kg elicited maternal and toxic effects.

Mutagenicity: This product was tested to be positive in a laboratory test tube study.

SECTION VII - SPILL OR LEAK PROCEDURES
This product as it is presently constituted is NOT classified as a hazardous waste under RCRA, 40 CFR 261. Spills entering (a) surface waters or (b) any water courses or sewers entering/leading to surface waters that cause a sheen must be reported to the National Response Center at 1-800-424-8802.

Steps to be taken in case material is spilled or released:
DO NOT ATTEMPT CLEAN UP OF MATERIAL WITHOUT PROPER PROTECTIVE CLOTHING AND RECOMMENDED RESPIRATORY PROTECTION.
SOAK UP MATERIAL WITH AN ABSORBENT AND SHOVEL INTO A WASTE CONTAINER. COVER CONTAINER, BUT DO NOT SEAL, AND REMOVE FROM WORK AREA.
RINSE AREA WITH WATER AND COLLECT SOLUTION IN CONTAINERS FOR DISPOSAL.
DO NOT FLUSH TO SEWER OR DISCHARGE TO NATURAL WATERWAYS.

Waste Disposal Method:
INCINERATE OR TREAT AS SOLID WASTE. THIS PRODUCT IS NOT LISTED AS A HAZARDOUS WASTE UNDER RCRA, 40 CFR 261.

RCRA Classification: NONE.

SECTION VIII - SPECIAL PROTECTION INFORMATION

TLV or Suggested Control Value: None established.
Ventilation: If needed, use local exhaust ventilation to keep airborne concentrations down.
Respiratory Protection: For general work area and when concentrations are below 50 ppm, use NIOSH approved CCROV or better respirator. For concentrations above 50 ppm, use NIOSH approved SA or better supplied-air respirator.
Protective clothing: Ester protective gloves are recommended. Depending on conditions of use, additional protection may be required such as apron, arm covers, or full body suit. Wash contaminated clothing before rewearin. Protective clothing should be selected and used in accordance with "Guidelines for the Selection of Chemical Protective Clothing" published by ACGIH.
Eye protection: DO NOT WEAR CONTACT LENSES WHILE HANDLING THIS PRODUCT! Chemical tight goggles and face shield recommended.
Other protective equipment: Eyewash station and safety shower in work area.
SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Prevent skin and eye contact. Avoid breathing vapors and aerosols. Workers should shower and change to fresh clothing after each shift. Store in tightly sealed containers to protect from atmospheric moisture. Store in a cool area. Individuals with existing respiratory disease such as chronic bronchitis, emphysema or asthma should not be exposed to product. These individuals should be identified through baseline and annual evaluation and removed from further exposure. HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL PRACTICES. DO NOT REUSE CONTAINERS. DO NOT WELD OR INTRODUCE SPARKS OR FLAMES AROUND CONTAINERS AS RESIDUAL VAPORS MAY BE HAZARDOUS.

SECTION X - REGULATORY INFORMATION

TSCA (Toxic Substances Control Act) REGULATIONS, 40 CFR 710:
All ingredients are on the TSCA Section 8(b) Inventory.

SARA TITLE III REPORTING REQUIREMENTS, 40 CFR 372.65 C:
Section 302/304: Extremely Hazardous Substances:
Component | CAS No. | % | RQ(lbs.) | TPQ(lbs.)
None.

CERCLA Section 102(a) Hazardous Substances:
Component | CAS No. | % | RQ(lbs.)
None.

Section 311/312: Hazard Categorization:
Acute | Chronic | Fire | Pressure | Reactive | Not Applicable

Section 313: Toxic Chemicals:
Component | CAS | %
None.

EPA PRIORITY POLLUTANTS:
None.

WHMIS CLASSIFICATION:
Not Controlled.

EEC:
R 22: Harmful; if swallowed
S 46: If swallowed, seek medical advice immediately and show this container or label.

STATE REGULATIONS:
California Hazardous Substance List: No.
California Safe Drinking Water and Toxics Enforcement Act (Prop. 65) No.
Florida Substance List No.
Illinois Toxic Substance List No.
Massachusetts Substance List No.
Maine Hazardous Substance List No.
Michigan Critical Materials List No.
Minnesota Hazardous Substance List No.
New Jersey Hazardous Substance List No.
Pennsylvania Hazardous Substance List No.
Rhode Island Hazardous Substance List No.

SECTION XI: TRANSPORT INFORMATION

U.S. DOT/IMO: PROPER SHIPPING NAME: CHEMICALS NOIBN, N.O.S.
HAZARD CLASSIFICATION: NOT RESTRICTED.
IDENTIFICATION NUMBER: LABEL REQUIRED: NONE REQUIRED.

IMDG: PROPER SHIPPING NAME: N/D
IATA: PROPER SHIPPING NAME: N/D
TDG: PROPER SHIPPING NAME: N/D
SECTION XII: WARNING STATEMENTS

1. ALL PHOSPHORUS COMPOUNDS MAY REASONABLY BE EXPECTED TO CONTAIN ARSENIC AND POSSIBLY CADMIUM AND/OR LEAD IN CONCENTRATIONS RANGING FROM A FEW PARTS PER BILLION TO A FEW PARTS PER MILLION.

2. HAZARD WARNING: THERE IS A POSSIBILITY THAT BICYCLIC PHOSPHATES OR PHOSPHITES CAN BE PRODUCED AS THE RESULT OF THERMAL DECOMPOSITION OF THIS PRODUCT IN COMBINATION WITH TRIMETHYLOL PROPANE, TRIMETHYLOL PROPANE-DERIVED PRODUCTS OR THEIR CORRESPONDING TRIMETHYLOL ALKANE HOMOLOGS. BICYCLIC PHOSPHATES AND PHOSPHITES ARE A CLASS OF MATERIALS WITH ACUTE NEUROTOXIC PROPERTIES WHICH PRODUCE CHARACTERISTIC CONVULSIVE SEIZURES IN TEST ANIMALS. THIS PRODUCT SHOULD NOT BE USED IN CONJUNCTION OR COMBINATION WITH TRIMETHYLOL PROPANE OR TRIMETHYLOL PROPANE-DERIVED PRODUCTS.

NOTE—> THE TERMS "FLAME RETARDANT" AND "FLAME RETARDANCE" AS USED HEREIN ARE RELATIVE TERMS AND ARE NOT INTENDED TO INDICATE HAZARDS PRESENTED BY END-PRODUCTS CONTAINING THIS PRODUCT, OR ANY OTHER MATERIAL, UNDER ACTUAL FIRE CONDITIONS. END-PRODUCTS CONTAINING THIS PRODUCT WILL BURN.

FLAME PROPERTIES OF THIS OR ANY OTHER RAW MATERIAL ARE NOT INTENDED TO REFLECT THE FIRE HAZARDS PRESENTED BY ANY END-PRODUCT CONTAINING THIS RAW MATERIAL.

HMIS CODE LETTER DESIGNATIONS FOR PERSONAL PROTECTIVE EQUIPMENT

A  Safety glasses
B  Safety glasses, gloves
C  Safety glasses, gloves, synthetic apron
D  Face shield, gloves, synthetic apron
E  Safety glasses, gloves, dust respirator
F  Safety glasses, gloves, synthetic apron, dust respirator
G  Safety glasses, gloves, vapor respirator
H  Splash goggles, gloves, synthetic apron, vapor respirator
I  Safety glasses, gloves, combination dust and vapor respirator
J  Safety glasses, gloves, synthetic apron, combination dust and vapor respirator
K  Airline hood or mask, gloves, full protective suit, boots
X  Situations requiring specialized handling

THE DATA AND RECOMMENDATIONS PRESENTED ARE BASED UPON INFORMATION AVAILABLE TO US WHICH WE BELIEVE TO BE RELIABLE. HOWEVER, THE INFORMATION HEREIN IS PROVIDED SOLELY FOR THE CONVENIENCE OF OUR CUSTOMERS, AND WE ASSUME NO LIABILITY FOR ANY OMISSIONS OR INACCURACIES. ALL PRODUCT DATA AND SPECIFICATIONS ARE SUBJECT TO ACTUAL TESTING AND TO THE TERMS OF OUR PURCHASE ORDER AND INVOICE. NO WARRANTIES ARE EXPRESSED OR IMPLIED REGARDING THE RESULTS OBTAINED FROM THE PRODUCT OR THAT ANY USE THEREOF WILL NOT INFRINGE ON ANY PATENT.