SZABO SCANDIC

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Produktinformation

- Forschungsprodukte & Biochemikalien
- Zellkultur & Verbrauchsmaterial
- Diagnostik & molekulare Diagnostik
- Laborgeräte & Service

Weitere Information auf den folgenden Seiten!
See the following pages for more information!

Lieferung & Zahlungsart

siehe unsere Liefer- und Versandbedingungen

Zuschläge

- Mindermengenzuschlag
- Trockeneiszuschlag
- Gefahrgutzuschlag
- Expressversand

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Glycidyltrimethylammonium chloride

sc-235263

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Glycidyltrimethylammonium chloride

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800
EMERGENCY:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C6-H14-Cl-N-O, "ammonium, (2, 3-epoxypropyl)trimethyl-, chloride", "(2, 3-epoxypropyl)trimethylammonium compound", "glycidyl trimethyl ammonium chloride", "oxiranemethanaminium, N, N, N-trimethyl-, chloride", "trimethylglycidylammonium chloride", "N, N, N-trimethyloxiranemethanaminium chloride", Glytac, "Glytac A-100", G-Mac, "quaternary ammonium compound"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	3		
Toxicity:	2		
Body Contact:	3		
Reactivity:	1		
Chronic:	3		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Irritating to skin.
Risk of serious damage to eyes.
May cause CANCER.
May cause SENSITISATION by skin contact.
Possible risk of impaired fertility.
Possible risk of irreversible effects.
Harmful: danger of serious damage to health by prolonged exposure if swallowed.
Harmful in contact with skin and if swallowed.
Highly flammable.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
■ Concentrated solutions of many cationics may cause corrosive damage to mucous membranes and the esophagus.
Nausea and vomiting (sometimes bloody) may follow ingestion.

EYE

■ If applied to the eyes, this material causes severe eye damage.

SKIN

■ Skin contact with the material may be harmful; systemic effects may resultfollowing absorption.
■ This material can cause inflammation of the skin oncontact in some persons.
■ The material may accentuate any pre-existing dermatitis condition.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
■ Solution of material in moisture on the skin, or perspiration, mayincrease irritant effects.

INHALED

■ The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified using animal models).
Nevertheless, adverse effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

CHRONIC HEALTH EFFECTS

■ Harmful: danger of serious damage to health by prolonged exposure if swallowed.
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.
Ample evidence from experiments exists that there is a suspicionthis material directly reduces fertility.
Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of
appropriate studies using mammalian somatic cells in vivo. Such findings are often supported by positive results from in vitro mutagenicity studies.
There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.
The epoxide group is an alkylating agent and thus destroysnucleotides within the cell. This may cause cancer.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
glycidyltrimethylammonium chloride	3033-77-0	>98
(3-chloro-2-hydroxypropyl)trimethylammonium chloride	3327-22-8	<4
epichlorohydrin	106-89-8	<10 ppm

Section 4 - FIRST AID MEASURES

SWALLOWED
· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. · Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE
■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN
■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

INHALED
· If dust is inhaled, remove from contaminated area. · Encourage patient to blow nose to ensure clear passage of breathing. · If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN
■ For exposures to quaternary ammonium compounds;
· For ingestion of concentrated solutions (10% or higher): Swallow promptly a large quantity of milk, egg whites / gelatin solution. If not readily available, a slurry of activated charcoal may be useful. Avoid alcohol. Because of probable mucosal damage omit gastric lavage and emetic drugs.
· For dilute solutions (2% or less): If little or no emesis appears spontaneously, administer syrup of Ipecac or perform gastric lavage.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	1.178
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA
■ For SMALL FIRES:
Dry chemical, CO_2, water spray or foam.
For LARGE FIRES:
Water-spray, fog or foam.

FIRE FIGHTING
· Alert Emergency Responders and tell them location and nature of hazard.
· Wear breathing apparatus plus protective gloves.
When any large container (including road and rail tankers) is involved in a fire,
consider evacuation by 1000 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
· Flammable solid which burns and propagates flame easily, even when partly wetted with water.
· Any source of ignition, i.e. friction, heat, sparks or flame, may cause fire or explosion.
Combustion products include: carbon monoxide (CO), carbon dioxide (CO_2), hydrogen chloride, phosgene, nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.

FIRE INCOMPATIBILITY
■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids,chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION
Glasses:
Chemical goggles.
Gloves:
Respirator:
Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
· Remove all ignition sources.
· DO NOT touch or walk through spilled material.
MAJOR SPILLS
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of overexposure occurs.
Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
· Do NOT cut, drill, grind or weld such containers.
· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

■ For low viscosity materials and solids: Drums and jerricans must be of the non-removable head type. Where a can is to be used as an inner package, the can must have a screwed enclosure.

STORAGE REQUIREMENTS

■ FOR MINOR QUANTITIES:
· Store in an indoor fireproof cabinet or in a room of noncombustible construction
· Provide adequate portable fire-extinguishers in or near the storage area.
May decompose in moist air or water.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
Canada - Ontario Occupational Exposure Limits	glycidyltrimethylammonium chloride (Particles (Insoluble or Poorly Soluble) Not Otherwise)		10 (I)						
Canada - British Columbia Occupational Exposure Limits	glycidyltrimethylammonium chloride (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10 (N)						
Canada - Ontario Occupational Exposure Limits	glycidyltrimethylammonium chloride (Specified (PNOS) / Particules (insolubles ou peu solubles) non précisées par ailleurs)		3 (R)						
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	glycidyltrimethylammonium chloride (Particulates not otherwise regulated Respirable fraction)		5						
US - California Permissible Exposure Limits for Chemical Contaminants	glycidyltrimethylammonium chloride (Particulates not otherwise regulated Respirable fraction)		5						(n)
US - Oregon Permissible Exposure Limits (Z-1)	glycidyltrimethylammonium chloride (Particulates not otherwise regulated (PNOR) (f) Total Dust)	-	10						Bold print identifies substances for which the Oregon Permissible Exposure

				Limits (PELs) are different than the federal Limits. PNOR means “particles not otherwise regulated.”
US - Michigan Exposure Limits for Air Contaminants	glycidyltrimethylammonium chloride (Particulates not otherwise regulated, Respirable dust)		5	
US - Oregon Permissible Exposure Limits (Z-1)	glycidyltrimethylammonium chloride (Particulates not otherwise regulated (PNOR) (f) Respirable Fraction)	-	5	Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means “particles not otherwise regulated.”
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	glycidyltrimethylammonium chloride (Particulates not otherwise regulated (PNOR)(f)- Respirable fraction)		5	
Canada - Prince Edward Island Occupational Exposure Limits	glycidyltrimethylammonium chloride (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)		10	See Appendix B current TLV/BEI Book

ENDOELTABLE

PERSONAL PROTECTION

RESPIRATOR

• type a filter of sufficient capacity.

EYE

· Safety glasses with side shields.
· Chemical goggles.

HANDS/FEET

■ NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other

protective equipment, to avoid all possible skin contact.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
· Contaminated gloves should be replaced.
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Wear physical protective gloves, eg. leather.

OTHER

· Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area.
· Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. A respirator affording higher levels of protection may be substituted.
· Emergency deluge showers and eyewash fountains, supplied with potable water, should be located near, within sight of, and on the same level with locations where direct exposure is likely.
· Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers must be identified with suitable labels. For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood.
· Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.
· Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
· For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

ENGINEERING CONTROLS

· Employees exposed to confirmed human carcinogens should be authorized to do so by the employer, and work in a regulated area.
· Work should be undertaken in an isolated system such as a "glove-box" . Employees should wash their hands and arms upon completion of the assigned task and before engaging in other activities not associated with the isolated system.
· Within regulated areas, the carcinogen should be stored in sealed containers, or enclosed in a closed system, including piping systems, with any sample ports or openings closed while the carcinogens are contained within.
· Open-vessel systems are prohibited.
· Each operation should be provided with continuous local exhaust ventilation so that air movement is always from ordinary work areas to the operation.
· Exhaust air should not be discharged to regulated areas, non-regulated areas or the external environment unless decontaminated. Clean make-up air should be introduced in sufficient volume to maintain correct operation of the local exhaust system.
· For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood. Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.
· Except for outdoor systems, regulated areas should be maintained under negative pressure (with respect to non-regulated areas).
· Local exhaust ventilation requires make-up air be supplied in equal volumes to replaced air.
· Laboratory hoods must be designed and maintained so as to draw air inward at an average linear face velocity of 150 feet/ min. with a minimum of 125 feet/ min. Design and construction of the fume hood requires that insertion of any portion of the employees body, other than hands and arms, be disallowed.
For large scale or continuous use:
· Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems
· Provide dust collectors with explosion vents.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

State	DIVIDED SOLID	Molecular Weight	151.64
Melting Range (°F)	244- 259 (decomp)	Viscosity	Not Applicable
Boiling Range (°F)	Not available	Solubility in water (g/L)	Reacts
Flash Point (°F)	Not available	pH (1% solution)	Not applicable
Decomposition Temp (°F)	244	pH (as supplied)	Not applicable

Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	1.178
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE
Moist off-white solid; reacts with water.

EPTAC is highly soluble in water (852.0 ± 16.7 g/l at 20 C), has low vapour pressure (< 10-3 Pa at 22 - 80 C) and low log Kow (< -1.3). Calculated Henry's law constant of <1.78 * 10 -7 Pa m3/mol indicates that EPTAC does not volatize from water to air. EPTAC is expected to have a low bioaccumulation potential to biota. Bioconcentration factors (BCFs) were calculated for fish and worm (1.41 l/kg and 3.34 kg/kg) based on the log Kow (<-1.3). Adsorption to sludge at the wastewater treatment plant is assumed to be low. Based on known properties of the substance, EPTAC is expected to distribute primarily to receiving water. CHPTAC is highly soluble in water (835.2 ± 9.9 g/l at 20°C), has low vapour pressure (10-3 Pa at 20 - 150°C) and low log Kow (< -1.5). Calculated Henry's law constant of < 2.25 · 10-7 Pa m3/mol indicates that CHPTAC does not volatise from water to air. CHPTAC is expected to have a low bioaccumulation potential to biota. Bioconcentration factors (BCFs) were calculated for fish and worm (1.41 l/kg and 3.36 kg/kg) based on the log Kow (<-1.5). Adsorption to sludge at the wastewater treatment plant is assumed to be low. Base on known properties of the substance, CHPTAC is expected to distribute mainly to receiving water.

Material	Value

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
· Presence of incompatible materials.
· Product is considered stable.

STORAGE INCOMPATIBILITY
■ Segregate from alcohol, water.
Avoid reaction with oxidizing agents.
· NOTE: May develop pressure in containers; open carefully. Vent periodically.
· Epoxides are highly reactive with acids, bases, and oxidizing and reducing agents.
· Epoxides react, possibly with anhydrous metal chlorides, ammonia, amines and group 1 metals.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

glycidyltrimethylammonium chloride

TOXICITY AND IRRITATION
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
■ For quaternary ammonium compounds (QACs):
Quaternary ammonium compounds (QACs) are cationic surfactants. They are synthetic organically tetra-substituted ammonium compounds, where the R substituents are alkyl or heterocyclic radicals. A common characteristic of these synthetic compounds is that one of the R's is a long-chain hydrophobic aliphatic residue
The cationic surface active compounds are in general more toxic than the anionic and non-ionic surfactants. The positively-charged cationic portion is the functional part of the molecule and the local irritation effects of QACs appear to result from the quaternary ammonium cation.
Due to their relative ability to solubilise phospholipids and cholesterol in lipid membranes, QACs affect cell permeability which may lead to cell death. Further QACs denature proteins as cationic materials precipitate protein and are accompanied by generalised tissue irritation.
It has been suggested that the experimentally determined decrease in acute toxicity of QACs with chain lengths above C16 is due to decreased water solubility.
In general it appears that QACs with a single long-chain alkyl groups are more toxic and irritating than those with two such substitutions,
The straight chain aliphatic QACs have been shown to release histamine from minced guinea pig lung tissue However, studies with benzalkonium chloride have shown that the effect on histamine release depends on the concentration of the solution. When cell suspensions (11% mast cells) from rats were exposed to low concentrations, a decrease in histamine release was seen. When exposed to high concentrations the opposite result was obtained.
In addition, QACs may show curare-like properties (specifically benzalkonium and cetylpyridinium derivatives, a muscular paralysis with no involvement of the central nervous system. This is most often associated with lethal doses Parenteral injections in rats, rabbits and dogs have resulted in prompt but transient limb paralysis and sometimes fatal paresis of the respiratory muscles. This effect seems to be transient.
From human testing of different QACs the generalised conclusion is obtained that all the compounds investigated to date exhibit similar toxicological properties.
Acute toxicity: Studies in rats have indicated poor intestinal absorption of QACs. Acute toxicity of QACs varies with the compound and, especially, the route of administration. For some substances the LD50 value is several hundreds times lower by the i.p. or i.v. than the oral route, whereas toxicities between the congeners only differ in the range of two to five times.

At least some QACs are significantly more toxic in 50% dimethyl sulfoxide than in plain water when given orally
Probably all common QAC derivatives produce similar toxic reactions, but as tested in laboratory animals the oral mean lethal dose varies with the compound .
Oral toxicity: LD50 values for QACs have been reported within the range of 250-1000 mg/kg for rats, 150-1000 mg/kg for mice, 150-300 mg/kg for guinea pigs and about 500 mg/kg b.w. for rabbits and dogs . The ranges observed reflect differences in the study designs of these rather old experiments as well as differences between the various QACs.
The oral route of administration was characterised by delayed deaths, gastrointestinal lesions and respiratory and central nervous system depression. It was also found that given into a full stomach, the QACs lead to lower mortality and fewer gastrointestinal symptoms. This support the suggestion of an irritating effect
Dermal toxicity: It has been concluded that the maximum concentration that did not produce irritating effect on intact skin is 0.1%. Irritation became manifest in the 1-10% range. Concentrations below 0.1% have caused irritation in persons with contact dermatitis or broken skin.
Although the absorption of QACs through normal skin probably is of less importance than by other routes , studies with excised guinea pig skin have shown that the permeability constants strongly depends on the exposure time and type of skin
Sensitisation: Topical mucosal application of QACs may produce sensitisation. Reports on case stories and patch test have shown that compounds such as benzalkonium chloride , cetalkonium chloride and cetrimide may possibly act as sensitisers . However, in general it is suggested that QACs have a low potential for sensitising man It is difficult to distinguish between an allergic and an irritative skin reaction due to the inherent skin irritating effect of QACs.
Long term/repeated exposure:
Inhalation: A group of 196 farmers (with or without respiratory symptoms) were evaluated for the relationship between exposure to QACs (unspecified, exposure levels not given) and respiratory disorders by testing for lung function and bronchial responsiveness to histamine. After histamine provocation statistically significant associations were found between the prevalence of mild bronchial responsiveness (including asthma-like symptoms) and the use of QACs as disinfectant. The association seems even stronger in people without respiratory symptoms.
Genetic toxicity: QACs have been investigated for mutagenicity in microbial test systems. In Ames tests using Salmonella typhimurium with and without metabolic activation no signs of mutagenicity has been observed. Negative results were also obtained in E. coli reversion and B. subtilis rec assays. However, for benzalkonium chloride also positive and equivocal results were seen in the B. subtilis rec assays.
■ For glycidyltrimethylammonium chloride (syn: 2,3-epoxypropyltrimethylammonium chloride; EPTAC)
Irritation, corrosivity and sensitisation: EPTAC is a severe eye irritant when 70 % solution is applied.
Although severe signs of skin irritation are seen in the Degussa-study (1981), the results of this assay are not considered relevant when drawing a conclusion on skin irritation of EPTAC. The method of the study is non-guideline and the exposure time is six times of the normally used. Based on a study conducted according to OECD guideline, EPTAC is not a skin irritant. Based on the findings in the skin irritation study EPTAC is not corrosive.
Based on the positive test results in guinea-pig maximisation tests and the patch tests in humans it can be concluded that EPTAC is sensitiser by skin contact.
Carcinogenicity: EPTAC is a local carcinogen when applied on mouse skin at 1 % concentration (estimated dose applied on the skin: ~50 mg/kg/application). There is some indication that EPTAC could also cause some systemic tumours (e.g. lung or mammary tumours) when applied to mouse skin as a 1 % solution. However, the relevance of these tumours to the treatment is uncertain
Moreover, it is possible that oral intake could have occurred during the experiment. Based on in vitro skin absorption data from CHPTAC, the dermal penetration property of EPTAC is ca. 45 % or 29% in mouse skin at a concentration of 0.1% and 1% respectively, while in human skin it is less than 6%. Regardless of this, it is difficult to completely disregard the relevance of the systemic tumours. Furthermore, as EPTAC has direct mutagenic potential, which does not seem to be inactivated by mammalian metabolising systems, carcinogenic properties could be expected.
Reproductive toxicity: Severe morphological changes in the reproductive organs of both sexes have been seen in animal experiments. An NOAEL of 10 mg/kg was obtained from a 28-day repeated dose toxicity study.
GLYCIDYLTRIMETHYLAMMONIUM CHLORIDE:

TOXICITY	IRRITATION
Subcutaneous (mouse) LD50: 90 mg/kg	Eye : SEVERE *
Oral (Rat) LD50: 1080 mg/kg *	
Dermal (Rabbit) LD50: 1500 mg/kg *	
Inhalation (Rat) LC50: >5000 mg/m³/4h *	

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.
* Summary Risk Assessment Final Report 2008 Finland

TOXICITY	**IRRITATION**

(3-CHLORO-2-HYDROXYPROPYL)TRIMETHYLAMMONIUM CHLORIDE:

Oral (Rat) LD50: 2170 mg/kg *

Dermal (Rat) LD50: 2348 mg/kg *

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the

irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

For (3-chloro-2-hydroxypropyl)trimethylammonium chloride (CHPTAC)

Repeated dose toxicity: Based on an oral 28-day limit study, there were only slight morphological changes seen in the kidney proximal tubules. The microscopical changes in kidneys appear similar to those seen with2,3-epoxypropyltrimethylammonium chloride (syn: glycidyltrimethylammonium chloride; EPTAC). In addition to the renal histopathological changes, there was a 20% increase in relative kidney weights in male animals. A slight decrease in left testis weight was noted when CHPTAC was administered dermally at a maximum dose of 5750 mg/kg/week.

Mutagenicity: All in vitro tests mutagenicity tests conducted with CHPTAC have given a positive result. However, the interpretation of these results is somewhat complicated because the purity of the CHPTAC used was sometimes questionable. Looking at the results of the AMES tests, the typically positive strains TA1535 and TA100 are the same which were positive also with). There can be at least two explanations for this: If technical grade CHPTAC was used it contained approximately 2-3 % EPTAC as an impurity.

Even when purified CHPTAC is used, it converts pH dependently to the more reactive epoxy form. At pH 9, approximately 80 % of CHPTAC are converted to EPTAC and at the typical in vitro test system pH, 7.5, up to 50 % conversion could occur It has been demonstrated however that when the vehicle for the substance was buffered to 4.0 or 5.5. No mutagenic activity was seen in TA1535, which was typically positive. Therefore, even if CHPTAC might not be a mutagen itself a partial conversion to the mutagenic EPTAC could occur in the body.

Carcinogenicity: Under the conditions of exposure, CHPTAC is not a local carcinogen in mice when administered via skin but there is a possibility that it is a systemic carcinogen based on the increased incidence of bronchiolo-alveolar tumours. However, the evidence on the systemic tumours is relatively weak and partly confounded by the duration of the study, which was longer than usually. Because there is not enough information on the mutagenicity in vivo, a directly genotoxic non-threshold mode of action of these tumours cannot be ruled out.

* Summary Risk Assessment Final Report 2008 Finland

Section 12 - ECOLOGICAL INFORMATION

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
glycidyltrimethylammonium chloride	HIGH	No Data Available	LOW	HIGH
(3-chloro-2-hydroxypropyl)trimethylammonium chloride	HIGH	No Data Available	LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information
Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)
B. Component Waste Numbers
When epichlorohydrin is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number U041 (waste code T).

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
· Reduction
· Reuse
· Recycling
· Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life

considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible.
· Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: G Hazard class or Division: 4.1
Identification Numbers: UN1325 PG: II
Label Codes: 4.1 Special provisions: A1, IB8,
IP2, IP4,
T3, TP33
Packaging: Exceptions: 151 Packaging: Non- bulk: 212
Packaging: Exceptions: 151 Quantity limitations: 15 kg
Passenger aircraft/rail:
Quantity Limitations: Cargo 50 kg Vessel stowage: Location: B
aircraft only:
Vessel stowage: Other: None
Hazardous materials descriptions and proper shipping names:
Flammable solids, organic, n.o.s.

Air Transport IATA:

ICAO/IATA Class: 4.1 ICAO/IATA Subrisk: None
UN/ID Number: 1325 Packing Group: II
Special provisions: A3
Cargo Only
Packing Instructions: 50 kg Maximum Qty/Pack: 448
Passenger and Cargo Passenger and Cargo
Packing Instructions: 15 kg Maximum Qty/Pack: 445
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: 5 kg Maximum Qty/Pack: Y441
Shipping Name: FLAMMABLE SOLID, ORGANIC, N.O.S. *(CONTAINS
GLYCIDYLTRIMETHYLAMMONIUM CHLORIDE)

Maritime Transport IMDG:

IMDG Class: 4.1 IMDG Subrisk: None
UN Number: 1325 Packing Group: II
EMS Number: F-A , S-G Special provisions: 274 915
Limited Quantities: 1 kg
Shipping Name: FLAMMABLE SOLID, ORGANIC, N.O.S.(contains glycidyltrimethylammonium chloride)

Section 15 - REGULATORY INFORMATION

glycidyltrimethylammonium chloride (CAS: 3033-77-0) is found on the following regulatory lists;
"Canada Non-Domestic Substances List (NDSL)","OECD Representative List of High Production Volume (HPV) Chemicals","US Toxic Substances Control Act (TSCA) - Inventory"

Regulations for ingredients
(3-chloro-2-hydroxypropyl)trimethylammonium chloride (CAS: 3327-22-8) is found on the following regulatory lists;
"Canada Domestic Substances List (DSL)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","OECD Representative List of High Production Volume (HPV) Chemicals","US EPA High Production Volume Program Chemical List","US Inventory of Effective Food Contact Substance Notifications","US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

ND
Substance CAS Suggested codes (3- chloro- 2- 3327- 22- 8 Rep3; R63 hydroxypropyl)trimethylammonium chloride

Ingredients with multiple CAS Nos
Ingredient Name CAS epichlorohydrin 106-89-8, 51594-55-9, 67843-74-7

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of

merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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