



# SZABO SCANDIC

Part of Europa Biosite

## 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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# Hydrogen peroxide-Urea adduct

sc-215155



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Hydrogen peroxide-Urea adduct

### 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

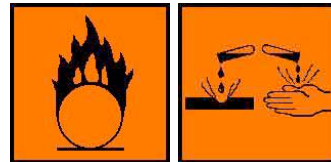
C-H6-N2-O3, "hydrogen peroxide solid", "urea dioxide", "hydrogen peroxide carbamide", "percarbamide perhyarol-urea", "urea hydroperoxide", "carbamide peroxide", Hydroperite, Hyperol, CH<sub>4</sub>N<sub>2</sub>O.H<sub>2</sub>O<sub>2</sub>, CO(NH<sub>2</sub>)<sub>2</sub>.H<sub>2</sub>O<sub>2</sub>

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	0	4
Toxicity:	2	4
Body Contact:	3	4
Reactivity:	2	4
Chronic:	2	4

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



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Contact with combustible material may cause fire.

Causes burns.

Risk of serious damage to eyes.

Harmful by inhalation and if swallowed.

## 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.

■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

■ Hydrogen peroxide may cause blistering and bleeding from the throat and stomach.

Ingested hydrogen peroxide may evolve large quantities of oxygen which could hyper-distend the gastro-intestinal tract and may cause internal bleeding. Ingestion of large amounts of hydrogen peroxide causes chest and stomach pain, loss of consciousness, and motor disorders in humans and has caused mortality in experimental animals.

#### EYE

■ The material can produce chemical burns to the eye following direct contact.

Vapors or mists may be extremely irritating.

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

■ Corneal ulcerations due to hydrogen peroxide exposure may not appear for up to a week after exposure; concentrations above 10% are corrosive to the eye.

#### SKIN

■ The material can produce chemical burns following direct contact with the skin.

■ Skin contact is not thought to produce harmful health effects (as classified using animal models).

Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions.

■ 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.

■ Hydrogen peroxide as a topical gel is used to cleanse minor wounds or minor gum inflammation.

In appropriate solution, hydrogen peroxide is used in topical and dental gels. Skin contact may cause bleaching, blistering and reddening.

#### INHALED

■ If inhaled, this material can irritate the throat and lungs of some persons.

■ Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful.

■ 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.

■ Inhalation of excessive levels of mist may result in headache, dizziness, vomiting, diarrhoea, irritability, insomnia and in extreme pulmonary oedema.

Systemic poisoning due to hydrogen peroxide inhalation may cause tremors and numbness of the extremities, convulsions, pulmonary oedema, coma and shock.

## CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

Hydrogen peroxide as a human food additive is generally regarded as safe when used in certain limitations. In experimental animals, oral administration of hydrogen peroxide causes dental, liver, kidney, stomach, and intestinal damage. Inhalation exposure to hydrogen peroxide caused skin irritation and sneezing in dogs, and high mortality in mice.

Hydrogen peroxide added to food is affirmed to be generally regarded as safe (GRAS) by the U.S. FDA when used to treat certain foods in specified limitations [FDA 21 CFR 184.1366 (4/1/93)]. Hydrogen peroxide may be used as a component of articles for use in packaging, handling, transporting, or holding food in accordance with prescribed conditions [FDA 21 CFR 175.105 (4/1/93)].

Dose-related growth retardation, induction of dental caries, and pathological changes in the periodontium were observed in young male rats receiving 1.5% hydrogen peroxide as their drinking fluid (equivalent to approximately 2.1 g/kg/day)<sup>2</sup> for 8 weeks.

Effects observed in mice treated for 35 weeks with 0.15% hydrogen peroxide as their drinking fluid (equivalent to approximately 0.29 g/kg/day)<sup>3</sup> included degeneration of hepatic and renal tubular epithelial tissues, necrosis, inflammation, irregularities of tissue structure

of the stomach wall, and hypertrophy of the small intestine wall. Concentrations in excess of 1% (equivalent to approximately 1.9 g/kg/day)<sup>4</sup> resulted in pronounced weight loss and death within two weeks. In a sequential study of mice treated with 0.4% hydrogen peroxide in drinking water (equivalent to approximately 0.76 g/kg/day)<sup>5</sup>, gastric erosion was observed at 30 days and was present consistently throughout the 108 week study period.

Dogs exposed 6 hours/day, 5 days/week for 6 months at an average vapour concentration of 7 ppm (9.73 mg/3 ) of 90% hydrogen peroxide, developed skin irritation, sneezing, lacrimation, and bleaching of the hair. Autopsy disclosed pulmonary irritation and greatly thickened skin, but no hair follicle destruction. No significant changes in blood or urinary parameters were observed.

Following eight 6-hour exposures to hydrogen peroxide at a concentration of 79 mg/m<sup>3</sup> (56.88 ppm), 7/9 mice died. Following exposure to hydrogen peroxide at 93 mg/m<sup>3</sup>, 6 hours/day, 5 days/week for 30 exposures, 1/10 rats died.

Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following.

### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
urea hydrogen peroxide	124-43-6	100
generates		
<a href="#">hydrogen peroxide</a>	7722-84-1	

### Section 4 - FIRST AID MEASURES

#### SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

#### 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 or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

#### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested. Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g.

#### NOTES TO PHYSICIAN

■ Treat symptomatically.

Hydrogen peroxide at moderate concentrations (5% or more) is a strong oxidant.

· Direct contact with the eye is likely to cause corneal damage especially if not washed immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered.

· Because of the likelihood of systemic effects attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided.

· There is remote possibility, however, that a nasogastric or orogastric tube may be required for the reduction of severe distension due to gas formation"

Fisher Scientific MSDS.

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung edema often do not manifest until a few hours have passed and they are aggravated by physical effort.

### Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not available
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	>1.0
Lower Explosive Limit (%):	Not available

#### EXTINGUISHING MEDIA

■ For hydrogen peroxide

NOTE: Chemical extinguishing agents may accelerate decomposition. [CCINFO].

FOR SMALL FIRE:

· USE FLOODING QUANTITIES OF WATER.

· DO NOT use dry chemicals, CO<sub>2</sub> or foam.

#### FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.

· May be violently or explosive reactive.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Will not burn but increases intensity of fire.

· Heating may cause expansion or decomposition leading to violent rupture of containers.

Decomposition may produce toxic fumes of: nitrogen oxides (NOx).

### FIRE INCOMPATIBILITY

■ Avoid storage with reducing agents.

· Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

### PERSONAL PROTECTION

Glasses:

Full face- shield.

Gloves:

Respirator:

Type B-P Filter of sufficient capacity

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

· Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.

· Check regularly for spills and leaks.

· Clean up all spills immediately.

· No smoking, naked lights, ignition sources.

### MAJOR SPILLS

· Clear area of personnel and move upwind.

· Alert Emergency Responders and tell them location and nature of hazard.

For hydrogen peroxide:

· Dilute with large quantities of water (at least ten (10) times the volume of hydrogen peroxide).

· Sodium bicarbonate may be used to accelerate breakdown.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

· Avoid personal contact and inhalation of dust, mist or vapors.

· Provide adequate ventilation.

### RECOMMENDED STORAGE METHODS

· DO NOT repack. Use containers supplied by manufacturer only.

For low viscosity materials

· 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.

Hydrogen peroxide containing/ generating materials requiring rigid packaging.

Store in:

· containers with vented lids.

· properly passivated aluminium containers.

· properly passivated stainless steel.

· polyethylene containers.

· porcelain, vitreous stoneware

· Teflon lined containers.

### STORAGE REQUIREMENTS

■ In addition, Goods of Class 5.1, packing group III should be stored in packages and be separated from buildings, tanks, and compounds containing other dangerous goods in tanks, and from property boundaries by a distance of at least 5 metres.

· Store at 4° C.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC	Notes
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

US NIOSH Recommended Exposure Limits (RELs)	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
Canada - Alberta Occupational Exposure Limits	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
US ACGIH Threshold Limit Values (TLV)	hydrogen peroxide (Hydrogen peroxide)	1			TLV Basis: eye, upper respiratory tract & skin irritation
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
US OSHA Permissible Exposure Levels (PELs) - Table Z1	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
Canada - British Columbia Occupational Exposure Limits	hydrogen peroxide (Hydrogen peroxide)	1			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
US - Minnesota Permissible Exposure Limits (PELs)	hydrogen peroxide (Hydrogen peroxide)	1	1.4		
US - California Permissible Exposure Limits for Chemical Contaminants	hydrogen peroxide (Hydrogen peroxide, as H2O2)	1	1.4		
US - Hawaii Air Contaminant Limits	hydrogen peroxide (Hydrogen peroxide)	1	1.4	2	3
US - Alaska Limits for Air Contaminants	hydrogen peroxide (Hydrogen peroxide)	1	1.4		

Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	hydrogen peroxide (Hydrogen peroxide)	1		2		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	hydrogen peroxide (Hydrogen peroxide)	1	1.5	2	2.8	
US - Washington Permissible exposure limits of air contaminants	hydrogen peroxide (Hydrogen peroxide)	1		3		
US - Michigan Exposure Limits for Air Contaminants	hydrogen peroxide (Hydrogen peroxide)	1	1.4			
Canada - Prince Edward Island Occupational Exposure Limits	hydrogen peroxide (Hydrogen peroxide)	1				TLV Basis: eye, upper respiratory tract & skin irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	hydrogen peroxide (Hydrogen peroxide)	1	1.4			
Canada - Nova Scotia Occupational Exposure Limits	hydrogen peroxide (Hydrogen peroxide)	1				TLV Basis: eye, upper respiratory tract & skin irritation
US - Oregon Permissible Exposure Limits (Z-1)	hydrogen peroxide (Hydrogen peroxide)	1	1.4			
Canada - Northwest Territories Occupational Exposure Limits (English)	hydrogen peroxide (Hydrogen peroxide)	1	1.4	2	2.8	

#### ENDOELTABLE

The following materials had no OELs on our records

- urea hydrogen peroxide: CAS:124-43-6

#### PERSONAL PROTECTION



#### RESPIRATOR

- Type B-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

#### EYE

- Chemical goggles.

- Full face shield.

## HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

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, AS/NZS 2161.1 or national equivalent).

- 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, AS/NZS 2161.10.1 or national equivalent) 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, AS/NZS 2161.10.1 or national equivalent) 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.

- Polyethylene gloves.
- DO NOT wear cotton or cotton-backed gloves.
- DO NOT wear leather gloves.
- Promptly hose all spills off leather shoes or boots or ensure that such footwear is protected with PVC over-shoes.
- Where hydrogen peroxide exposure may occur do NOT wear PVA gloves.
- DO NOT use leather or cotton gloves, leather shoes as spill may cause fire.
- Care: Effects may be delayed.
- Hand cream offers no protection for hydrogen peroxide and should not be used.

## OTHER

- Overalls.
- PVC Apron.
- 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

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

Mixes with water.

Corrosive.

State	Divided solid	Molecular Weight	94.09
Melting Range (°F)	167- 176	Viscosity	Not Applicable
Boiling Range (°F)	Decomposes @167	Solubility in water (g/L)	Soluble
Flash Point (°F)	Not applicable	pH (1% solution)	Not applicable
Decomposition Temp (°F)	104	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Not available
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	>1.0
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Not applicable	Evaporation Rate	Not applicable

### APPEARANCE

White fine crystals; mixes with water (0.05 gm/ml) in water. Decomposed by warm water @ 40 deg C releasing powerful oxidiser hydrogen peroxide which may in turn release large volume of oxygen gas; with possible pressure build up. Soluble in ethanol and ethylene glycol. Active Oxygen content 16% min.

log Kow -1.36 Hydrogen peroxide (log Kow < -1) is an inorganic substance and therefore shows little potential to bioaccumulate.

Material	Value
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## Section 10 - CHEMICAL STABILITY



## CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
  - Unstable under normal storage, requires special storage condition.
- Solutions of hydrogen peroxide slowly decompose, releasing oxygen, and so are often stabilised by the addition of acetanilide, etc.

## STORAGE INCOMPATIBILITY

### ■ Hydrogen peroxide

- is a powerful oxidiser
- contamination or heat may cause self accelerating exothermic decomposition with oxygen gas and steam release - this may generate dangerous pressures - steam explosion.
- reacts dangerously with rust, dust, dirt, iron, copper, acids, metals and salts, organic material.
- is unstable if heated. (e.g): one volume of 70% hydrogen peroxide solution decomposes to produce 300 volumes of oxygen gas.
- in presence of a strong initiating source may be explosively reactive
- concentrated or pure material can generate heat and decompose spontaneously; can ignite or explode when heated, shocked, contaminated; or if placed in a basic (>7) environment, especially in the presence of metal ions
- mixtures with combustible materials may result in spontaneous combustion or may be impact- or heat- sensitive - evaporation or drying on towels or mop may cause a fire.
- reacts violently with reducing agents, alcohols, ammonia, carboxylic acids, acetic acid, cobalt oxides, copper(II) chloride, ethers, metal powder, permanganates, acetone, benzenesulfonic anhydride, 1,1-dimethylhydrazine, dimethylphenylphosphine, gadolinium hydroxide, hydrogen selenide, iron oxides, lithium tetrahydroaluminate, magnesium tetrahydroaluminate, manganese(II) oxide, mercury oxide, methyl hydrazine, nickel monoxide, nitrogenous bases, osmium tetroxide, alpha-phenylselenoketones, phosphorus, phosphorus(V) oxide, quinoline, tetrahydrothiophene, tin(II) chloride, thiodiglycol, thiophane, tin(II) chloride, unsaturated organic compounds, readily oxidisable and combustible materials; avoid contact with combustibles including lubricants and graphite
- reacts with cobalt, copper and its alloys, chromium, iridium, iron, lead, manganese, Monel, osmium, palladium, platinum, gold, silver, zinc, and other catalytic metals, metal oxides and salts - avoid metallic bowls and stirrers.
- violent catalytic decomposition will occur in contact with certain metals such as iron, copper, chromium, brass, bronze, lead, silver, manganese or their salts.
- forms unstable and possible explosive materials with acetic anhydride, acetic acid, aniline, carboxylic acids, 1,4-diazabicyclo[2,2,2]octane, diphenyl diselenide, ethyl acetate, glycols, ketene, ketones, triethyltin hydroperoxide, 1,3,5-trioxane, vinyl acetate.
- is incompatible with mercurous chloride
- decomposes in presence of alkalis and even ordinary dust or rust
- decomposes slowly at ordinary temperatures and builds up pressure in a closed container; the rate of decomposition doubles for each 10 deg C rise in temperature and decomposition becomes self-sustaining at 141 deg. C
- contact with rough surfaces can cause decomposition
- attacks and may ignite some plastics, rubber and coatings.
- Inorganic oxidising agents can react with reducing agents to generate heat and products that may be gaseous (causing pressurization of closed containers). The products may themselves be capable of further reactions (such as combustion in the air).
- Organic compounds in general have some reducing power and can in principle react with compounds in this class. Actual reactivity varies greatly with the identity of the organic compound.
- Inorganic oxidising agents can react violently with active metals, cyanides, esters, and thiocyanates.
- Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.
- Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.
- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

Avoid storage with reducing agents.

BEWARE: dissolves in acetone and ethyl ether forming unstable peroxides which may decompose spontaneously i.e. detonate.

Avoid all contamination

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

## Section 11 - TOXICOLOGICAL INFORMATION

urea hydrogen peroxide

### TOXICITY AND IRRITATION

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
- 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.

UREA HYDROGEN PEROXIDE:

- No chronic human exposure data is available.

## HYDROGEN PEROXIDE:

TOXICITY	IRRITATION
Dermal (rabbit) LD50: 4060 mg/kg	Nil Reported
Dermal (rabbit) LDLo: 500 mg/kg	
Inhalation (mouse) LC50: 2000 mg/kg/4h	

### ■ For hydrogen peroxide:

Hazard increases with peroxide concentration, high concentrations contain an additive stabiliser.

#### Pharmacokinetics

Hydrogen peroxide is a normal product of metabolism. It is readily decomposed by catalase in normal cells. In experimental animals exposed to hydrogen peroxide, target organs affected include the lungs, intestine, thymus, liver, and kidney, suggesting its distribution to those sites.

Hydrogen peroxide has been detected in breath.

· Absorption: Hydrogen peroxide is decomposed in the bowel before absorption. When applied to tissue, solutions of hydrogen peroxide have poor penetrability.

· Distribution Hydrogen peroxide is produced metabolically in intact cells and tissues. It is formed by reduction of oxygen either directly in a two-electron transfer reaction, often catalysed by flavoproteins, or by an initial one-electron step to O<sub>2</sub> followed by dismutation to hydrogen peroxide.

· Hydrogen peroxide has been detected in serum and in intact liver. based on the results of toxicity studies, the lungs, intestine, thymus, liver, and kidney may be distribution sites. In rabbits and cats that died after intravenous administration of hydrogen peroxide, the lungs were pale and emphysematous. Following intraperitoneal injection of hydrogen peroxide in mice, pyknotic nuclei were induced in the intestine and thymus (IARC 1985). Degeneration of hepatic and renal tubular epithelial tissue was observed following oral administration of hydrogen peroxide to mice.

· Metabolism Glutathione peroxidase, responsible for decomposing hydrogen peroxide, is present in normal human tissues (IARC 1985). When hydrogen peroxide comes in contact with catalase, an enzyme found in blood and most tissues, it rapidly decomposes into oxygen and water.

· Excretion Hydrogen peroxide has been detected in human breath at levels ranging from 1.0+/- .5 g/L to 0.34+/-0.17 g/L.

#### Carcinogenicity

Gastric and duodenal lesions including adenomas, carcinomas, and adenocarcinomas have been observed in mice treated orally with hydrogen peroxide. Marked strain differences in the incidence of tumors have been observed. Papilloma development has been observed in mice treated by dermal application.

#### Genotoxicity

Hydrogen peroxide induced DNA damage, sister chromatid exchanges and chromosomal aberrations in mammalian cells in vitro . Hydrogen peroxide induced DNA damage in bacteria (E. coli), and was mutagenic to bacteria (Salmonella typhimurium) and the fungi, Neurospora crassa and Aspergillus chevallieri, but not to Streptomyces griseoflavus. It was not mutagenic to Drosophila melanogaster or to mammalian cells in vitro.

#### Developmental Toxicity

Malformations have been observed in chicken embryos treated with hydrogen peroxide, but experiments with mice and rats have been negative.

Female rats that received 0.45% hydrogen peroxide (equivalent to approximately 630 mg/kg/day)<sup>7</sup> as the sole drinking fluid for five weeks produced normal litters when mated with untreated males.

Doses of 1.4 to 11 mol/egg hydrogen peroxide (purity 30%) dissolved in water were injected into the airspace of groups of 20-30 white leghorn chicken eggs on day 3 of incubation.

Embryos were examined on day 14. The incidence of embryonic deaths and malformations was dose-related and detected at doses of 2.8 mol/egg and above. The combined ED50 was 2.7 mol/egg.

#### Reproductive Toxicity

A 1% solution of hydrogen peroxide (equivalent to 1900 mg/kg/day) given as the sole drinking fluid to three-month-old male mice for 7-28 days did not cause infertility.

### The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

## CARCINOGEN

Hydrogen peroxide	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Hydrogen peroxide	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	A3
hydrogen peroxide	US - Rhode Island Hazardous Substance List	IARC	
TWAPPM~	US - Maine Chemicals of High Concern List	Carcinogen	A3

## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

## Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
urea hydrogen peroxide	No Data Available	No Data Available		
hydrogen peroxide	LOW	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)

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

#### 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: None Hazard class or Division: 5.1

Identification Numbers: UN1511 PG: III

Label Codes: 5.1, 8 Special provisions: A1, A7,

A29, IB8,

IP3, T1,

TP33

Packaging: Exceptions: 152 Packaging: Non- bulk: 213

Packaging: Exceptions: 152 Quantity limitations: 25 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 100 kg Vessel stowage: Location: A aircraft only:

Vessel stowage: Other: 13

Hazardous materials descriptions and proper shipping names:

Urea hydrogen peroxide

#### Air Transport IATA:

UN/ID Number: 1511 Packing Group: III

Special provisions: None

Cargo Only

Packing Instructions: 563 Maximum Qty/Pack: 100 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: Y545 Maximum Qty/Pack: 25 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 559 Maximum Qty/Pack: 5 kg

Shipping Name: UREA HYDROGEN PEROXIDE

#### Maritime Transport IMDG:

IMDG Class: 5.1 IMDG Subrisk: 8

UN Number: 1511 Packing Group: III

EMS Number: F-A,S-Q Special provisions: None

Limited Quantities: 5 kg

Shipping Name: UREA HYDROGEN PEROXIDE

## Section 15 - REGULATORY INFORMATION

### **urea hydrogen peroxide (CAS: 124-43-6) is found on the following regulatory lists;**

"Canada Non-Domestic Substances List (NDSL)","US - New Jersey Right to Know Hazardous Substances","US NFPA 1 Annex B Typical Oxidizers","US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

### **Regulations for ingredients**

### **hydrogen peroxide (CAS: 7722-84-1) is found on the following regulatory lists;**

"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Industrial Hazardous Substances","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","International Air Transport Association (IATA) Dangerous Goods Regulations","US - Alaska Limits for Air Contaminants","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - California Permissible Exposure Limits for Chemical Contaminants","US - Connecticut Hazardous Air Pollutants","US - Hawaii Air Contaminant Limits","US - Massachusetts Oil & Hazardous Material List","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Hazardous Substance List","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know Hazardous Substances","US - Oregon Hazardous Materials","US - Oregon Permissible Exposure Limits (Z-1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants","US - Washington Permissible exposure limits of air contaminants","US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit Values (TLV)","US ACGIH Threshold Limit Values (TLV) - Carcinogens","US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA Master Testing List - Index I Chemicals Listed","US FDA Indirect Food Additives: Adhesives and Components of Coatings - Substances for Use Only as Components of Adhesives - Adhesives","US Food Additive Database","US Inventory of Effective Food Contact Substance Notifications","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act","US NFPA 1 Annex B Typical Oxidizers","US NIOSH Recommended Exposure Limits (RELs)","US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US SARA Section 302 Extremely Hazardous Substances","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory","USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27"

## Section 16 - OTHER INFORMATION

### **LIMITED EVIDENCE**

■ Cumulative effects may result following exposure\*.

\* (limited evidence).

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■ 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](http://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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