SECTION H
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SECONDARY DIRECT FOOD ADDITIVE

OOF - 1332

EA1

000367

Section H1: Environmental Assessment Summary

ENVIRONMENTAL ASSESSMENT FOR PROPOSED APPROVALS OF FDA REGULATED PRODUCTS

KX-6110

May 20, 2000

Ecolab, Inc.
370 Wabasha St. North
St. Paul, MN 55102

1. **DATE:** May 20, 2000

2. **NAME OF PETITIONER:** Ecolab Inc.

3. **ADDRESS**: 370 Wabasha St. North
St. Paul, MN 55102

4. DESCRIPTION OF PROPOSED ACTION

a). Requested approval: This petition requests that FDA amend 21 CFR 173 by allowing for the use of an aqueous antimicrobial solution (KX-6110) consisting of hydrogen peroxide, acetic acid, peroxyacetic acid, octanoic acid, peroxyoctanoic acid, and hydroxyethylene diphosphonic acid (HEDP) as a carcass wash to reduce the surface microbiological content of freshly killed beef carcasses. This product is applied directly to the exposed surface of the carcass via a sprayer after the hide is removed and the head and the hooves are cut off. When the product diluted to the use concentration (1 ounce of concentrate to 6 gallons of water), it consists of acetic acid (624 ppm), hydrogen peroxide (58.6 ppm), octanoic acid (114 ppm), peroxyacetic acid (182 ppm), peroxyoctanoic acid (17.6 ppm) and hydroxyethylidine-1,1-diphosphonic acid (7.8 ppm). (Concentrations listed are approximate and vary slightly with age of the product).

b.) Need for action: This product is an antimicrobial solution that is designed to reduce the bacterial count on the surface of freshly killed beef carcasses. By reducing the bacteria present, this will retard the bacterial degradation of the meat and reduce the content of pathogenic organisms on the surface of the carcass. This will produce a safer food supply and allow the treated meat to have a longer shelf life.

c.) Locations of use/disposal: This product is proposed for use in beef processing plants. The quantity used will ultimately depend on market penetration, number of carcasses treated and size of the facility.

This product is designed to be applied to the surface of freshly killed beef carcasses following removal of the hide, head and hooves. This is accomplished by spraying the carcasses with the product as they move down a conveyor line. The carcasses are hung from a hook on a trolley. The trolley carries the carcass into a cabinet where spray nozzles are located in such a manner as to spray the surface of the beef carcass with sufficient product to accomplish the technical effect of surface pathogen reduction. The carcass exits the other side of the cabinet and continues processing.

After the product is sprayed onto the carcass, the majority of the product will drain off the meat and ultimately run into drains and enter the meat processing plant water treatment facility. Very minor quantities are lost to evaporation into the air.

5. IDENTIFICATION OF SUBSTANCES THAT ARE THE SUBJECT OF PROPOSED ACTION

The product will consist of the following chemicals in the approximate percentages listed. This represents the finished concentrated KX-6110 formula. The product will undergo significant dilution prior to application to the beef carcasses.

The only raw materials used in this product are hydrogen peroxide, acetic acid, octanoic acid and hydroxyethylidine-1,1-diphosphonic acid (HEDP). The peroxyacetic acid and the peroxyoctanoic acid are formed by the reaction of acetic acid with hydrogen peroxide and octanoic acid with hydrogen peroxide, respectively.

Chemical Substance % in concentrate	**CAS No.**	**Structure**	**MW**	**Physical Form**
Hydrogen peroxide, 4.5%	7722-84-1	H-O-O-H	34	Clear liquid
Acetic acid 48.0%	64-19-7	$CH_3-C(=O)-OH$	60	Clear liquid
Peroxyacetic acid 14.0%	79-21-0	$CH_3-C(=O)-OOH$	76	Clear liquid
Octanoic acid 8.8%	124-07-2	$CH_3-(CH_2)_6-C(=O)-OH$	144	Light yellow liquid
Peroxyoctanoic acid 1.4%	33734-57-5	$CH_3-(CH_2)_6-C(=O)-OOH$	160	Waxy, white solid
Water 22.7%	7732-18-5	H-O-H	18	Colorless liquid
Hydroxyethylene Diphosphonic acid 0.6%	2809-21-4	$HO-P(=O)(OH)-C(CH_3)(OH)-P(=O)(OH)-OH$	206	Colorless liquid

6. INTRODUCTION OF SUBSTANCES INTO THE ENVIRONMENT

a. Introduction of substances into the environment as a result of manufacture

Only negligible environmental releases are anticipated during the production of the subject additive. The manufacture of the product involves only mixing of ingredients in a closed system at ambient temperature. Several of the components have vapor pressures capable of producing very small losses to the environment. Only the top surface of the mixture is open to the air, however, each mix tank is equipped with a scrubber eliminating virtually any material escaping from the tank and reaching the environment. With these safeguards in place, the total loss to the atmosphere is insignificant.

The process of manufacture of this product will involve the use of a dedicated tank. This tank will be used to produce consecutive batches and will not be cleaned or washed out between runs. Therefore under normal operating conditions, no loss to the environment is expected via the septic system. If there is required maintenance on the tank, any residual product is rinsed out of the tank and the rinse water is collected in drums, and is not sewered. The rinse water is then used as the water component of the next batch produced, thus eliminating any discharge of this material to a publicly owned wastewater treatment plant (POTW).

There are no extraordinary circumstances that pertain to the manufacture of this product. There are no emissions that are expected to result in any harm to the environment, violate any federal, state, or local law or threaten any habitat of an endangered species protected under federal law.

b. Introduction of substances into the environment as a result of use/disposal

Estimates of the quantity produced annually will vary greatly depending on market acceptance, performance, the availability of alternatives and the amount of meat that is treated. It is therefore not possible to give an accurate projection of the amount that will be sold in the future. However, some estimation of the quantity of may be made using past experience and judgement. It is projected that in the fifth year of production, approximately 200,000 gallons of this product will be used.

This product is designed to be applied to the surface of freshly killed beef carcasses. This is accomplished by spraying the carcasses with the product as they move down a conveyor line. The hide is removed, the head and the feet are cut off, and the carcasses are hung from a hook on a trolley. The trolley carries the carcass into a cabinet where spray nozzles are located in such a manner as to spray the carcass with sufficient product to accomplish the technical effect of surface pathogen reduction. The carcass exits the other side of the cabinet and continues processing.

The excess carcass wash drips off the meat and empties into a floor drain along with other beef wastes such as blood. This carcass wash is sprayed continuously as the carcasses pass through the cabinet. The estimates for the amount of carcass wash concentrate used range from about 70 to 225 oz. of concentrated product per conveyor line, per hour. The concentrate is diluted to the use solution before it is applied to the surface of the beef. The total amount used in the facility will depend on the number of carcasses sprayed, the flow rate, the number of processing lines running and the number of hours or shifts the facility operates. For the purpose of estimating total volume consumed, we will use relatively conservative (high) estimates.

If we assume the maximum use rate of 225 oz. of concentrated product per hour, a facility that operates 2 shifts (16 hours a day) and has 2 processing lines uses:

225 ounces/hour x 2 x 16 hours = 7200 oz.

or approximately 56 gallons of product per day. The discharge to the POTW is calculated in the table, below.

POTW LOADING OF DISCHARGES FROM BEEF PROCESSING PLANTS RESULTING FROM THE USE OF KX6110 [1][2]

Component	Percentage In Concentrate[3]	Use Rate (gpd)	Load to 25 Million Gpd – POTW (ppb)	Effluent From POTW (ppb) [4]
Hydrogen Peroxide	4.5	2.5	100	10
Acetic Acid	48.0	26.9	1,076	106
Peroxyacetic Acid	14.0	7.8	312	31
Octanoic Acid	8.8	4.9	196	20
Peroxyoctanoic Acid	1.4	0.8	32	3
HEDP	0.6	0.3	12	1
Water	22.7	13.3	NA	NA
Total Product	100.0	56	2240	224

[1] Assumes that the waste stream is directly sent to a POTW, although this is not the case. In meat processing facilities, effluents are sent to a pre-treatment facility. Essentially all of the components in this product will be degraded before they ever enter a POTW. Therefore, the results of these calculations are a drastic overestimation of the actual environmental releases.

[2] Assumes use of 56 gallons/day of KX-6110 per meat processing facility; assumes a 25 million gpd POTW Treatment Facility

[3] Concentrations are approximate and depend on the age of the product, temperature, dilution, etc.

[4] Assumes a 90% degradation rate at the POTW

7. FATE OF EMITTED SUBSTANCES

Air

Small amounts of acetic acid and hydrogen peroxide will be emitted into the air. Hydrogen peroxide is not stable in sunlight, and undergoes photolytic decomposition. Both the hydrogen peroxide and acetic acid will be removed from the air by rain. Only small quantities of these chemicals are anticipated to be released into the air and are not expected to result in any adverse environmental effects. The remaining components in the formula are not very volatile and are expected to remain dissolved in the water matrix and enter the drain. These chemicals will enter the water treatment facility.

The Occupational Safety & Health Administration (OSHA) has set permissible exposure limits (PEL's) of 10 ppm for acetic acid and 1 ppm for hydrogen peroxide. Based on the significant amount sprayed and the proximity of workers to the spray cabinets, industrial hygiene practices such as proper ventilation and personal protective equipment may be necessary. Initial monitoring may be necessary to ensure the ambient levels of these chemicals are below the respective PEL's. See section F-2 for component MSDSs.

Water

This product will be collected in drains at the facility and mixed with other discharges, including waste streams containing organic materials and biological wastes such as blood. Upon contact with these materials, the active ingredients (peroxides) in the carcass wash will degrade into simple molecules such as acetic acid, water, oxygen, carbon dioxide octanoic acid and aliphatic hydrocarbons. The wastewater goes through several processing steps including dissolved air flotation, anaerobic treatment, activated sludge and chlorination/dechlorination prior to release to the POTW.

Hydrogen peroxide

Hydrogen peroxide will react with organic molecules and also undergo enzymatic degradation via catalase, glutathione peroxidase or other nonspecific peroxidases. Microbial action can also degrade it to water and oxygen.

$$H_2O_2 \rightarrow H_2O+O_2$$

Acetic acid

Acetic acid is not an environmentally hazardous material and may be used as a carbon source for living matter.

Peroxyacetic acid

Peroxyacetic acid rapidly undergoes degradation by reaction with organic molecules, enzymatic degradation by some peroxidases and is degraded by metal catalysis into hydrogen peroxide and acetic acid.

$$H_2O + CH_3COOOH \rightarrow CH_3COOH + H_2O_2$$

Octanoic acid

Octanoic acid is a medium chain length organic acid. It occurs naturally in living tissues. It can serve as a carbon source. It is essentially nontoxic and is not an environmentally hazardous material.

Peroxyoctanoic acid

Peroxyoctanoic acid will undergo degradation to octanoic acid and hydrogen peroxide by reactions with organic molecules or by the action of some peroxidases into octanoic acid and hydrogen peroxide. The breakdown products are then degraded as described as above.

$$H_2O + CH_3\text{-}(CH_2)_6\text{-}COOOH \rightarrow CH_3\text{-}(CH_2)_6\text{-}COOH + H_2O_2$$

As outlined above, all the components in the formula are likely to undergo rapid degradation to simple non-toxic molecules. These reactions take place rapidly due to the chemically unstable nature of the active ingredients. Based on these reactions, only water, oxygen, acetic acid, carbon dioxide, octanoic acid and other hydrocarbons will be released into the environment.

8. ENVIRONMENTAL EFFECTS OF RELEASED SUBSTANCES

All of the components in this product break down to simple non-toxic molecules. This process will occur long before leaving the waste treatment area of the facility. No adverse environmental effects are expected to result from the use of this material.

Hydrogen peroxide: Decomposes rapidly in water to oxygen and water and is not actually expected to enter the environment, after wastewater treatment.

Acetic acid: As can be seen from the table presented in section 6, potential worst case release to the environment (maximum 10 ppb) is much lower than the reported toxicity values to aquatic organisms. The reported 96-hr fish LC_{50}'s are in the range of 80 ppm allowing a greater than 1000-fold safety factor (see Appendix 2 for available data on the environmental effects of acetic acid).

Peroxyacetic acid: Decomposes rapidly in water to acetic acid and is not actually expected to enter the environment, after wastewater treatment.

Octanoic acid: Rapidly degraded by wastewater treatment micro-organisms (since it is a fatty acid utilized as an energy and carbon source by same) and is not actually expected to enter the environment, after wastewater treatment.

Peroxyoctanoic acid: Decomposes rapidly in water to octanoic acid and is not actually expected to enter the environment, after wastewater treatment.

Hydroxyethylene diphosphonic acid (HEDP): Data on HEDP are available from the suppliers (see MSDS for HEDP in Appendix 1) and are summarized here. The data indicate that HEDP is practically non-toxic to many aquatic and avian organisms however, it is "slightly toxic" to oysters (EC_{50} between 10 and 100 ppm on EPA's standard rating scale for toxicity to aquatic organisms). As noted above, the potential release levels of this substance to the environment are well below the EC_{50}, being on the order of 1 ppb thus allowing a greater than 1000-fold safety factor.

See environmental fate data in section H-3

9. USE OF RESOURCES AND ENERGY

Due to the rather limited use of this product, the simple precursors used in developing the product and quantities that will be used, only a minimal amount of renewable natural resources will be consumed in the production and distribution of this product. The starting raw materials for the production of KX-6110 will be commercially purchased commodity chemicals and will meet Food Chemical Codex requirements for food grade materials. The actual amount of resources used will depend on the market penetration and demand for the finished product. No resources should be used in treating/disposing of spent product. Disposal of unused product will represent a rare event. Infrequently, the product may be spilled and enter the treatment facility directly.

This product may replace the use of chlorine dioxide solutions that are currently used in this application. Although the products have very similar use profiles, they are very different. Both products are produced by renewable resources and degrade into environmentally acceptable products. The net effect is that there is not a significant difference in the use of energy or resources of the two products.

Based on the use patterns of this product, no effects are anticipated on endangered species. Use of this product will not adversely impact any property listed in the National Register of Historic Places.

10. MITIGATION MEASURES

None necessary.

11. ALTERNATIVES TO THE PROPOSED ACTION

None.

12. PREPARER

Robert M. Harrington, Ph.D.
Corporate Toxicologist
Director, EH&S Compliance
Ecolab Inc.

13. CERTIFICATION

The undersigned official certifies that the information presented is true, accurate and complete to the best of the knowledge of Ecolab Inc.

Robert M. Harrington, Ph.D.
Corporate Toxicologist
Director, EH&S Compliance

5/20/00
Date

Section H2: Component Material Safety Data Sheets (MSDS's)
(Note: Component MSDS's is separated by colored paper)
Hydrogen Peroxide
Acetic Acid
Peroxyacetic Acid
Octanoic Acid
Peroxyoctanoic Acid
HEDP

HYDROGEN PEROXIDE
MATERIAL SAFETY DATA SHEET

240648

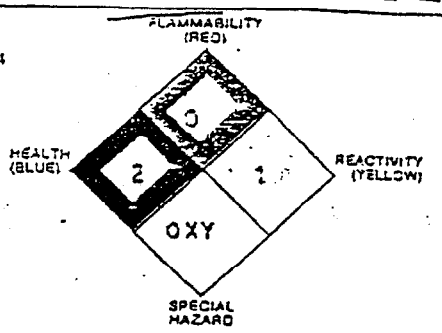
FMC

MATERIAL SAFETY DATA 7722 84 1 16

HYDROGEN PEROXIDE 35%
FOOD GRADE

NFPA Designation 704

DEGREE OF HAZARD
4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNIFICANT



EMERGENCY TELEPHONE NOS:
CHEMTREC (800) 424-9300
MEDICAL (303) 595-9048 CALL COLLECT
OTHER (609) 924-6677 CALL COLLECT

REVISION: C3	EFFECTIVE: 04/03/98 PRINTED: 04/05/98
PREPARED FOR USE BY.....	AMERICAN INDUSTRIAL CHEMICAL ATTN: DARRELL DIXON 1819 S. COBB INDUSTRIAL BLVD. SMYRNA, GA 30082
==========	IDENTIFICATION ==========
INFORMATION PROVIDED BY..:	PEROXYGEN CHEMICALS DIVISION FMC CORPORATION 2000 MARKET STREET PHILADELPHIA, PA. 19103 (215) 299-6000
==========	CONTENTS ==========
	LATEST REVISIONS NOTED IN BOLD PRINT FOR 30 DAYS FROM DATE OF REVISION. ADDITIONAL TECHNICAL DATA AT END OF MSDS.
==========	PRODUCT INFORMATION ==========
SYNONYMS.....:	HYDROGEN PEROXIDE 35%
SHIPPING NAME - DOT.....:	HYDROGEN PEROXIDE SOLUTION (35%) OXIDIZER
IATA.....:	HYDROGEN PEROXIDE SOLUTION (35%) OXIDIZER
IMCO.....:	HYDROGEN PEROXIDE SOLUTION (35%) OXIDIZER
FORMULA.....:	H2O2
CHEMICAL FAMILY.....:	PEROXYGEN
PRODUCT USES.....:	FOOD GRADE H2O2 IS SPECIAL HIGH PURITY MATERIAL. IT IS DESIGNED FOR USE IN PROCESSING APPLICATIONS THAT REQUIRE MATERIAL OF EXCEEDINGLY LOW RESIDUE AND FREE OF ORGANIC CONTAMINANTS. THE PRODUCT MEETS THE REQUIREMENTS OF THE FOOD CHEMICALS CODEX EDITION III, PAGES 146-147.

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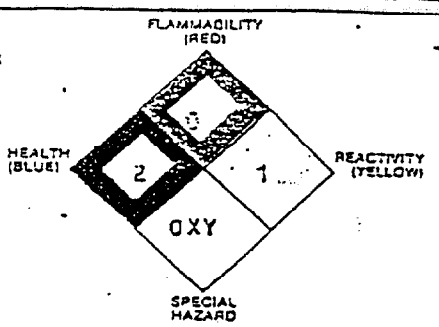

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==========	PRECAUTIONARY INFORMATION ==========
PRECAUTIONARY STATEMENT..: (PLEASE USE THIS STATEMENT TO SATISFY THE IN-PLANT LABELING REQUIREMENTS OF THE OSHA HAZARD COMMUNICATIONS STANDARD 29CFR 1910.1200)	HEALTH: LIQUID IS CORROSIVE TO THE EYE AND SKIN AND DIRECT EYE CONTACT MAY CAUSE IRREVERSIBLE TISSUE DAMAGE INCLUDING BLINDNESS. INHALATION OF MIST OR VAPOR WILL CAUSE SEVERE IRRITATION OF LUNGS, THROAT AND NOSE THAT USUALLY SUBSIDES AFTER EXPOSURE CEASES. SWALLOWING MAY PRODUCE CORROSION (BURNING) OF THE GASTROINTESTINAL TRACT THAT MAY BE LIFE-THREATENING. PHYSICAL: INITIATES COMBUSTION IN OTHER MATERIALS BY CAUSING FIRE THROUGH RELEASE OF OXYGEN.
==========	INGREDIENTS ==========
CAS# AND COMPONENT.....:	MATERIAL/COMPONENT: HYDROGEN PEROXIDE PERCENT.....: 35% CAS #.....: 7722-84-1 HAZARD CLASS.....: OXIDIZER MATERIAL/COMPONENT: WATER PERCENT.....: 65%
CANADIAN PRODUCT IDENTIFICATION NUMBER....:	2014

FMC

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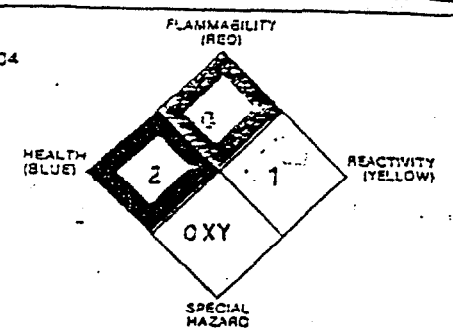

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==========	PHYSICAL DATA ==========
MELTING/FREEZING POINT...:	-33*C (-27*F)
BOILING POINT.....:	108*C (226*F)
VAPOR PRESSURE.....:	23.3 MM HG @ 30*C
VAPOR DENSITY (AIR = 1)..:	UNKNOWN
ROOM TEMPERATURE APPEARANCE AND STATE:	CLEAR, COLORLESS LIQUID
ODOR.....:	ODORLESS
SPECIFIC GRAVITY (H2O =1):	1.13 @ 20*C/4*C
SOLUBILITY IN H2O % BY WT:	100%
% VOLATILES BY VOLUME....:	100%
EVAPORATION RATE (BUTYL ACETATE = 1)..:	ABOVE 1
PH (AS IS).....:	2.0-3.0
PH (1% SOLUTION).....:	5.0-6.0
ODOR THRESHOLD.....:	NOT AVAILABLE
DENSITY (GMS/ML).....:	NOT AVAILABLE
COEFF. WATER/OIL DIST....:	NOT AVAILABLE
==========	FIRE, EXPLOSION AND REACTIVITY DATA ==========
FLASH POINT.....:	NON-FLAMMABLE
AUTOIGNITION TEMPERATURE..:	NON-COMBUSTIBLE
FLAMMABLE LIMITS (AIR) UPPER..:	NON-COMBUSTIBLE
LOWER..:	NON-COMBUSTIBLE
EXTINGUISHING MEDIA.....:	WATER, WATER FOG, CO2, DRY CHEMICAL
SPECIAL FIREFIGHTING PROCEDURES.....:	ANY TANK OR CONTAINER SURROUNDED BY FIRE SHOULD BE FLOODED WITH WATER FOR COOLING. IF HYDROGEN PEROXIDE IS LEAKING, WEAR FULL PROTECTIVE CLOTHING AND NIOSH CERTIFIED BREATHING APPARATUS (SCBA).
DEGREE OF FIRE AND EXPLOSION HAZARD.....:	HYDROGEN PEROXIDE ITSELF IS NONCOMBUSTIBLE. ON DECOMPOSITION RELEASES OXYGEN WHICH MAY INTENSIFY FIRE. HYDROGEN PEROXIDE VAPORS AND MISTS ARE EXTREMELY IRRITATING TO EYES AND SKIN.
STABILITY.....:	UNSTABLE
HAZARDOUS POLYMERIZATION..:	WILL NOT OCCUR
CONDITIONS TO AVOID.....:	EXCESSIVE HEAT, CONTAMINATION OF ANY KIND.

FMC

MATERIAL SAFETY DATA 7722 84 1 1c

HYDROGEN PEROXIDE 35%
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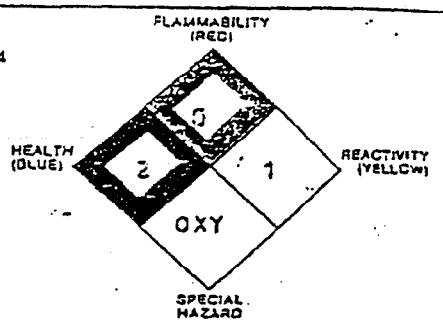

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FIRE, EXPLOSION AND REACTIVITY DATA

MAJOR CONTAMINANTS THAT CONTRIBUTE TO INSTABILITY	REDUCING AGENTS, RUSTS, DIRT, ORGANIC MATERIALS, PH ABOVE 4.
INCOMPATIBILITY	IRON AND OTHER HEAVY METALS, GALVANIZED IRON, COPPERS, COPPER ALLOYS, RUST, DIRT, ORGANICS, WOOD, PAPER OR OTHER COMBUSTIBLES.
HAZARDOUS DECOMPOSITION PRODUCTS	OXYGEN WHICH SUPPORTS COMBUSTION.
SENSITIVITY TO MECH IMPACT	NOT AVAILABLE
SENSITIVITY TO STATIC DISCHARGE	NOT AVAILABLE

ROUTES OF EXPOSURE

		SOURCE	DATE
EYE CONTACT	EXTREMELY IRRITATING- CORROSIVE (RABBIT) REF. I83-748	FMC	1983
SKIN CONTACT	MILDLY IRRITATING AFTER 4 HRS. EXPOSURE; SKIN DESTRUCTION AFTER 24 HRS. EXPOSURE (RABBIT) REF. I83-747	FMC	1983
SKIN ABSORPTION	LD50 ABOVE 2000 MG/KG (RABBIT) REF. I83-746	FMC	1983
INHALATION	TLV = 1 PPM (1.5 MG/M3) TWA	ACGIH	1987
	PEL = 1 PPM TWA	OSHA	1985
	LC50 = 2MG/L (90% H2O2, RAT 4 HR.)	RTECS	
INGESTION	LD50 = 1193 MG/KG (MALE RAT) AND 1270 MG/KG (FEMALE RAT) REF. I83-745	FMC	1983
	LC50 - NOT AVAILABLE		

EXPOSURE LIMITS

	SOURCE	DATE
TLV = 1 PPM (1.5MG/M3) TWA	ACGIH	1987
PEL = 1 PPM TWA	OSHA 1910.1000	1985

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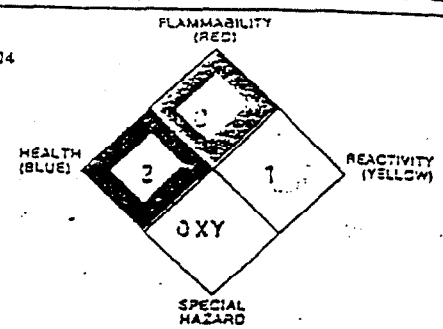

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==========	EFFECTS OF OVEREXPOSURE ==========
ACUTE EXPOSURE.....:	SEVERE IRRITANT TO EYES, NOSE, THROAT, LUNGS AND GASTROINTESTINAL TRACT. MAY CAUSE IRREVERSIBLE TISSUE DAMAGE TO THE EYES, INCLUDING BLINDNESS.
CHRONIC EXPOSURE.....: (EFFECTS CONSIDERED INCLUDE: SENSITIVITIES, CARCINOGENICITY, TERATOGENICITY, MUTAGENICITY, SYNERGISTIC PRODUCTS, AND ANY MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE.)	THERE ARE REPORTS OF LIMITED EVIDENCE OF CARCINOGENICITY OF HYDROGEN PEROXIDE TO MICE ADMINISTERED HIGH CONCENTRATIONS IN THEIR DRINKING WATER (IARC MONOGRAPH 36, 1985). HOWEVER THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER CONCLUDED THAT HYDROGEN PEROXIDE COULD NOT BE CLASSIFIED AS TO ITS CARCINOGENICITY TO HUMANS (GROUP III CARCINOGEN). ACCORDINGLY THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) DOES NOT REQUIRE THAT HYDROGEN PEROXIDE BE IDENTIFIED AS A CARCINOGEN. SENSITIVITIES, TERATOGENICITY, MUTAGENICITY, SYNERGISTIC PRODUCTS, REPRODUCTIVE TOXICITY, AND ANY MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE WERE EXAMINED AND NO INFORMATION WAS FOUND OR IS AVAILABLE.
==========	EMERGENCY AND FIRST AID PROCEDURES ==========
EYES.....:	IMMEDIATELY FLUSH WITH A LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS INTERMITTENTLY. SEE AN OPTHALMOLOGIST.
SKIN.....:	WASH WITH LARGE AMOUNTS OF WATER. IF IRRITATION PERSISTS, OBTAIN MEDICAL ATTENTION.
INHALATION.....:	REMOVE TO FRESH AIR. CALL A PHYSICIAN.
INGESTION.....:	IF SWALLOWED, DRINK PLENTY OF WATER IMMEDIATELY TO DILUTE. DO NOT INOUCE VOMITING. SEE A PHYSICIAN.
DECONTAMINATION PROCEDURE:	WASH AREA WITH LARGE AMOUNTS OF WATER.

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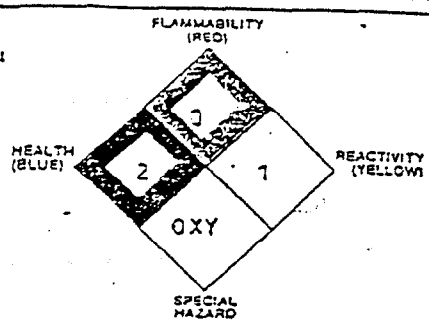

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MEDICAL (303) 595-9048 CALL COLLECT
OTHER (209) 924-6677 CALL COLLECT

REVISION: 08 EFFECTIVE: 04/03/90 PRINTED: 06/05/98

==========	**EMERGENCY AND FIRST AID PROCEDURES** ==========
NOTES TO PHYSICIAN.....:	HYDROGEN PEROXIDE AT THIS CONCENTRATION IS A STRONG OXIDANT. DIRECT CONTACT WITH THE EYE IS SUFFICIENTLY LIKELY TO CAUSE CORNEAL DAMAGE, ESPECALLY IF NOT WASHED AWAY IMMEDIATELY SO THAT CAREFUL OPHTHALMOLOGIC EVALUATION IS RECOMMENDED AND THE POSSIBILITY OF LOCAL CORTICOSTEROID THERAPY SHOULD BE CONSIDERED. BECAUSE OF THE LIKELIHOOD OF CORROSIVE EFFECTS ON THE GASTRO-INTESTINAL TRACT AFTER INGESTION, AND THE UN-LIKELIHOOD OF SYSTEMIC EFFECTS, ATTEMPTS AT EVACUATING THE STOMACH VIA EMESIS INDUCTION OR GASTRIC LAVAGE SHOULD BE AVOIDED. THERE IS A RE-MOTE POSSIBILITY, HOWEVER, THAT A NASOGASTRIC OR OROGASTRIC TUBE MAY BE REQUIRED FOR THE REDUC-TION OF SEVERE DISTENSION DUE TO GAS FORMATION.
==========	**SPECIAL PROTECTION** ==========
VENTILATION REQUIREMENTS..:	PROVIDE GENERAL AND LOCAL EXHAUST VENTILA-TION AS NECESSARY. CONTROL MISTS IN WORKPLACE AT OR BELOW EXPOSURE GUIDELINES (TLV 1 PPM FOR 8 HRS.)
RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT	
RESPIRATORY.....:	FOR SEVERE VAPOR OR MIST (CONCENTRATION IN EXCESS OF 10 PPM) USE NIOSH CERTIFIED SELF-CONTAINED BREATHING APPARATUS. DO NOT USE ANY OXIDIZABLE SORBANTS.
EYES.....:	CUP TYPE CHEMICAL GOGGLES AND/OR FULL FACE MASK.
GLOVES.....:	LIQUID PROOF RUBBER OR NEOPRENE GLOVES.
SPECIAL CLOTHING AND EQUIPMENT..:	POLYESTER OR ACRYLIC FULL COVER CLOTHING.
FOOTWEAR.....:	RUBBER OR NEOPRENE FOOTWEAR.

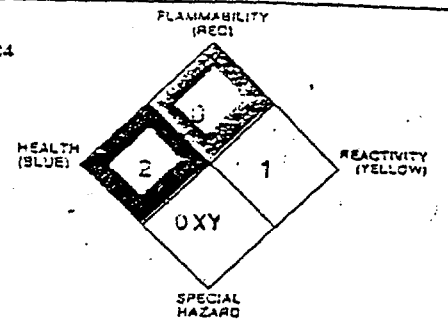
FMC

MATERIAL SAFETY DATA 7722 84 1 16

HYDROGEN PEROXIDE 35%
FOOD GRADE

NFPA Designation 704

DEGREE OF HAZARD
4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNIFICANT



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==========	STORAGE AND HANDLING ==========
(PLEASE USE THIS STATEMENT TO SATISTY THE IN-PLANT LABELING REQUIREMENTS OF THE OSHA HAZARD COMMUNICATIONS STANDARD 29CFR 1910.1200)	WEAR CUP TYPE CHEMICAL SAFETY GOGGLES, POLYESTER OR ACRYLIC FULL COVER CLOTHING AND RUBBER OR NEOPRENE GLOVES AND SHOES. AVOID EXCESSIVE HEAT. AVOID CONTAMINATION OF ANY KIND. CONTAMINATION MAY CAUSE DECOMPOSITION AND GENERATION OF OXYGEN GAS WHICH COULD RESULT IN HIGH PRESSURES AND POSSIBLE CONTAINER RUPTURE. HYDROGEN PEROXIDE SHOULD NOT BE STORED IN AN UNVENTED CONTAINER AND SHOULD BE TRANSFERRED ONLY IN A PRESCRIBED MANNER (SEE FMC TECHNICAL BULLETINS). NEVER RETURN UNUSED HYDROGEN PEROXIDE TO ORIGINAL CONTAINER. EMPTY DRUMS SHOULD BE RINSED WITH WATER BEFORE DISCARDING. UTENSILS USED FOR HANDLING HYDROGEN PEROXIDE SHOULD BE MADE ONLY OF THE FOLLOWING COMPATIBLE MATERIALS: GLASS, STAINLESS STEEL, ALUMINUM OR PLASTIC. STORAGE SHOULD CONFORM TO CONDITIONS DESCRIBED IN NFPA BULLETIN 43A (CODE FOR THE STORAGE OF LIQUID AND SOLID OXIDIZING MATERIALS). NFPA HAZARD CLASS II OXIDIZER.
==========	DISPOSAL, SPILL OR LEAK PROCEDURES ==========
PROCEDURE FOR RELEASE....: OR SPILL	DILUTE WITH A LARGE VOLUME OF WATER AND HOLD IN A POND OR DIKED AREA UNTIL THE H2O2 DECOMPOSES. DISPOSE OF ACCORDING TO THE METHODS OUTLINED BELOW FOR WASTE DISPOSAL.
WASTE DISPOSAL METHOD....:	AN ACCEPTABLE METHOD OF DISPOSAL IS TO DILUTE WITH A LARGE AMOUNT OF WATER AND ALLOW THE HYDROGEN PEROXIDE TO DECOMPOSE FOLLOWED BY DISCHARGE INTO A SUITABLE TREATMENT SYSTEM IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL ENVIRONMENTAL LAWS, RULES, REGULATIONS, STANDARDS AND OTHER REQUIREMENTS. BECAUSE ACCEPTABLE METHODS OF DISPOSAL MAY VARY BY LOCATION AND BECAUSE REGULATORY REQUIREMETNS MAY CHANGE, THE APPROPRIATE REGULATORY AGENCIES SHOULD BE CONTACTED PRIOR TO DISPOSAL.

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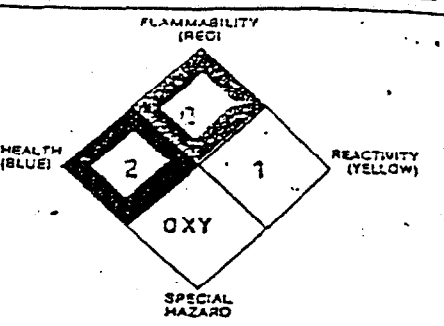

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==========	**TRANSPORTATION DATA** ==========
DOT PROPER SHIPPING NAME.:	HYDROGEN PEROXIDE SOLUTION 35%
DOT CLASSIFICATION.....:	OXIDIZER
DOT LABELS.....:	OXIDIZER
DOT MARKING.....:	HYDROGEN PEROXIDE SOLUTION 35%, UN NO 2014
DOT PLACARD.....:	OXIDIZER (NOT REQUIRED FOR SHIPMENTS IN BULK QUANTITIES. REF. CFR 49 173.266, E)
UN NUMBER.....:	2014
HAZARDOUS SUBSTANCE/RQ...:	NOT LISTED
49 STCC NUMBER.....:	4918775
EMERGENCY ACCIDENT PRECAUTIONS AND PROCEDURE:	KEEP PEOPLE AWAY. WEAR FULL PROTECTIVE CLOTHING. USE WATER ONLY FOR FIRE.
PRECAUTIONS TO BE TAKEN..: IN TRANSPORTATION	PROTECT FROM PHYSICAL DAMAGE. DRUMS SHOULD NOT BE STACKED DURING TRANSIT. KEEP DRUMS IN UP-RIGHT POSITION.
TYPE PACKAGES.....:	POLYETHYLENE CONTAINERS/DOT 34
OTHER SHIPPING IDS.....:	
==========	**ADDITIONAL REGULATORY INFORMATION** ==========
MATERIAL IS REPORTED IN EPA TSCA INVENTORY LIST?	YES
MATERIAL IS LISTED AS A CARCINOGEN/POTENTIAL CARCINOGEN IN FOLLOWING	
NTP ANNUAL REPORT... ?	NO
IARC GROUP I OR II...?	NO
OSHA 29CFR PART 1910 SUBPART Z ?	NO
ACGIH APPENDIX A.....?	NO
DOES PRODUCT CONTAIN A TOXIC CHEMICAL(S) SUBJECT TO SARA TITLE III SECTION 313 REPORTING.....	NO
CHEMICAL(S).....:	THIS PRODUCT DOES NOT CONTAIN ANY TOXIC CHEMICALS IN QUANTITIES SUBJECT TO THE REPORING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) AND 40 CFR PART 372.

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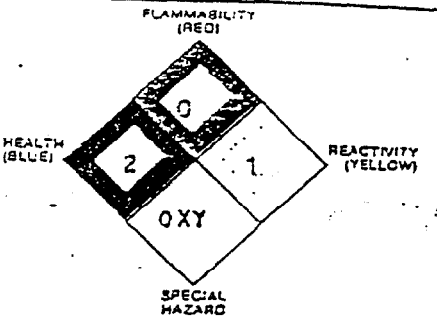

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REVISION: 08 EFFECTIVE: 04/03/90 PRINTED: 06/05/90

========== ADDITIONAL REGULATORY INFORMATION ==========

SARA TITLE III SECTION 311/312 CLASSIFICATION...: IMMEDIATE (ACUTE) HEALTH HAZARD.
FIRE HAZARD.

==========

PROPOSITION 65 - CALIFORNIA
SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 (PROPOSITION 65) - CALIFORNIA. THIS ACT REQUIRES THAT THE GOVERNMENT OF CALIFORNIA DEVELOP A LIST OF CARCINOGENS AND REPRODUCTIVE TOXINS AND THAT NO PERSONS DOING BUSINESS SHALL KNOWINGLY EXPOSE ANY INDIVIDUAL TO A CHEMICAL KNOWN TO THE STATE TO CAUSE CANCER OR REPRODUCTIVE TOXICITY WITHOUT FIRST GIVING CLEAR AND REASONABLE WARNING TO SUCH AN INDIVIDUAL.
FMC WOULD LIKE YOU TO KNOW THAT OUR 70% HYDROGEN PEROXIDE CONTAINS THE INDICATED CONCENTRATION(S) OF CHEMICALS WHICH ARE LISTED BY CALIFORNIA AS CHEMICALS KNOW TO CAUSE CANCER(A), REPRODUCTIVE TOXICITY(B) OR BOTH OF THESE EFFECTS(C).

CHEMICAL	CONCENTRATION (PPM, PPB, % ETC)	LISTED AS: (A), (B), (C)
ARSENIC	EQUAL TO/LESS THAN 0.1 PPM	(A)
CADMIUM	EQUAL TO/LESS THAN 0.1 PPM	(A)
CHROMIUM	EQUAL TO/LESS THAN 0.2 PPM	(A)
LEAD	EQUAL TO/LESS THAN 0.5 PPM	(B)

NOTE:
PERCENTAGES LESS THAN 70% HYDROGEN PEROXIDE WOULD CONTAIN PROPORTIONATELY LESS CONCENTRATION OF THE CHEMICALS IDENTIFIED.

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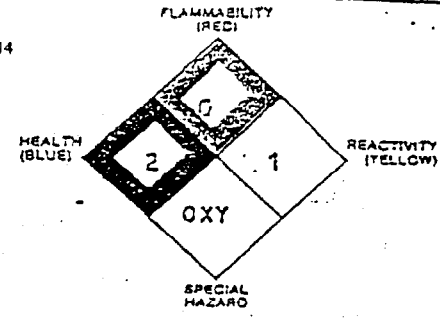

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ADDITIONAL INFORMATION

AQUATIC TOXICITY CLASSIFICATION -NIOSH RTECS NO. 79-100	SOURCE	DATE
SLIGHTHLY TOXIC TO FATHEAD MINNOW (96 HR LC50: 22-35 MG/L)	FMC SC	1979

ADDITIONAL TECHNICAL DATA

SUGGESTED USES.....: FOOD GRADE HYDROGEN PEROXIDE IS SPECIAL HIGH PURITY MATERIAL. IT IS DESIGNED FOR USE IN PROCESSING APPLICATIONS THAT REQUIRE MATERIAL OF EXCEEDINGLY LOW RESIDUE AND FREE OF ORGANIC CONTAMINANTS. THE PRODUCT MEETS THE REQUIREMENTS OF THE FOOD CHEMICALS CODEX EDITION III, PAGES 146-147.

TYPICAL ANALYSIS.....:

ACTIVE OXYGEN CONTENT, %	16.5
SPECIFIC GRAVITY (20*C/4*C)	1.13
LBS/GAL (KG/M3 OR G/L) @ 20*C	9.42 (1130)
H2O2 GRAM PER LITER @ 20*C	396

SPECIFICATIONS.....:

RESIDUE (100*C), %	0.006 MAX, 60 PPM (UG/G)
ORGANIC MATERIAL	NIL
HEAVY METALS AS LEAD, %	0.001 MAX, 10 PPM (UG/G)
ACIDITY AS H2SO4, %	0.03 MAX, 300 PPM (UG/G)
STABILITY, 24 HOURS @ 100*C	96% MIN

ADDITIONAL INFORMATION...: THE FOLLOWING FMC BULLETINS, AVAILABLE ON REQUEST, PROVIDE ADDITIONAL DETAILED INFORMATION ON PROPERTIES, HANDLING PROCEDURES AND SAFETY PRECAUTIONS OF HYDROGEN PEROXIDE:

- "HYDROGEN PEROXIDE", TECHNICAL BULLETIN #141
- "STORAGE EQUIPMENT FOR BULK SHIPMENTS OF HYDROGEN PEROXIDE", TECHNICAL BULLETIN #125
- "THE ANALYSIS OF HYDROGEN PEROXIDE SOLUTIONS", TECHNICAL BULLETIN #59

RETURN TO MENU

ACETIC ACID
MATERIAL SAFETY DATA SHEET

AAC100 - ACETIC ACID GLACIAL

Celanese

DISTRIBUTED BY:
INDUSTRIAL CHEMICALS INC.
2042 MONTREAT DRIVE
BIRMINGHAM, AL 35216-4040
205-823-7330

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998
recd 12/14/98

Material Safety Data Sheet

Print date – November 05, 1998 4:33 a.m. 3510 PG1A XDH21001 – 254.1 (1584/2185)

1. CHEMICAL PRODUCT and COMPANY IDENTIFICATION

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2

SYNONYMS: ETHANOIC ACID
METHANECARBOXYLIC ACID

TRANSPORTATION EMERGENCY PHONE NUMBER (24 HOURS/DAY):
In USA, call..........800 424 9300.
Outside USA, call*....202 483 7617.
*collect calls accepted
In Canada, call.......403 477 8339.

2. COMPOSITION / INFORMATION on INGREDIENTS

COMPONENT	CAS NUMBER	
ACETIC ACID *	64-19-7	99.85%

*OSHA hazardous according to 29 CFR 1910.1200

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
Acetic acid is a clear, colorless mobile liquid with a strong, acrid, vinegar-like odor.

WARNING!
Flammable liquid and vapor.

POTENTIAL HEALTH EFFECTS

ROUTES OF EXPOSURE:
Skin, Eyes, Inhalation, Ingestion

IMMEDIATE EFFECTS

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

3. HAZARDS IDENTIFICATION (Continued)

SKIN:

Can cause chemical burn.

EYES:

Can cause chemical burn--damage irreversible. Vapors are severely irritating.

INHALATION:

Causes severe irritation of nasal passages, throat and lungs. Can cause pulmonary edema (accumulation of fluid in the lungs); signs and symptoms can be delayed for several hours.

INGESTION:

Causes severe irritation of and damage to mouth, throat and stomach.

DELAYED/LONG TERM EFFECTS

REPRODUCTION: No evidence of reproductive effects (human experience).

CARCINOGENIC:

No evidence of carcinogenicity (human experience).

MUTAGENIC:

No evidence of mutagenicity (human experience).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Significant exposure to this chemical may adversely affect people with chronic disease of the respiratory system, skin, eyes and/or teeth.

FOR FURTHER INFORMATION, SEE:
Section 4 - First Aid Measures
Section 5 - Fire Fighting Measures
Section 6 - Accidental Release Measures
Section 8 - Exposure Controls/Personal Protection
Section 9 - Physical and Chemical Properties
Section 10 - Stability and Reactivity

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

4. FIRST AID MEASURES

SKIN:
Remove contaminated clothing and wash contaminated skin with large amounts of soap and water. If irritation persists, contact a physician.

EYES:
Flush eyes with water for at least 15 minutes. Contact a physician immediately.

INHALATION:
Remove patient from contaminated area. If breathing has stopped, give artificial respiration, then oxygen if needed. Contact a physician immediately.

INGESTION:
Patient should be made to drink large quantities of water. Do not induce vomiting. Contact a physician immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASHPOINT CLOSED CU: 42.8 C (109. F)
FLASHPOINT OPEN CUP : 44.5 C (112. F)
UPPER EXPLOSIVE LMT : 16.6
% In air by volume.
LOWER EXPLOSIVE LMT : 5.3
% In air by volume.

PRODUCTS OF COMBUSTION:
Carbon monoxide.

EXTINGUISHING MEDIA:
Use carbon dioxide or dry chemical for small fires; alcohol-type aqueous film-forming foam or water spray for large fires.

FIRE FIGHTING INSTRUCTIONS:
If potential for exposure to vapors or products of combustion exists, wear complete personal protective equipment, including self-contained breathing apparatus with full facepiece operated in pressure demand or other positive pressure mode. Water spray can be used to reduce intensity of flames and to dilute spills to nonflammable mixture. Use water spray to cool fire-exposed structures and vessels.

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

6. ACCIDENTAL RELEASE MEASURES

Eliminate ignition sources. Avoid eye or skin contact; see "Section 8 - Exposure Controls/Personal Protection" for respirator information. Place leaking containers in well-ventilated area with spill containment. If fire potential exists, blanket spill with alcohol-type aqueous film-forming foam or use water spray to disperse vapors. Contain spill to facilitate clean-up. Clean-up methods may include absorbent materials, vacuum truck, etc. Avoid run-off into storm sewers and ditches leading to water ways.

Call the National Response Center (800 424 8802) if the quantity spilled is equal to or greater than the reportable quantity (RQ) under CERCLA "Superfund": 5000 lb/day.

If an odor or acidity problem exists, neutralize with lime or sodium bicarbonate.

For more information, see "Section 15 - Regulatory Information".

7. HANDLING and STORAGE

HANDLING:

Use with adequate ventilation. Keep containers closed when not in use. Always open containers slowly to allow any excess pressure to vent. Avoid breathing vapor. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Decontaminate soiled clothing thoroughly before re-use. Destroy contaminated leather clothing.

When transferring, follow proper grounding procedures. Keep away from heat, sparks and flame.

STORAGE:

Store in a well-ventilated area. Use only DOT-approved containers.

Do not store with incompatible materials; see "Section 10 - Stability and Reactivity".

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred.

PROTECTIVE EQUIPMENT
A safety shower and eye bath should be readily available.

SKIN:
Wear impervious clothing and gloves to prevent repeated or prolonged contact. The recommended material of construction is:
Nitrile rubber.

EYES:
Wear chemical goggles when there is a reasonable chance of eye contact.

INHALATION:
Based on workplace contaminate level and working limits of the respirator, use a respirator approved by NIOSH/MSHA. The following is the minimum recommended equipment for an acceptable level of exposure. To estimate an acceptable level of exposure, see "Section 3 - Hazards Identification", "Section 8 - Exposure Controls/Personal Protection" and "Section 11 - Toxicological Information".

For concentrations >= 1 and <= 10 times the acceptable level: Use air-purifying respirator with full facepiece and organic vapor cartridge(s) or air-purifying full facepiece respirator with an organic vapor canister or a full facepiece powered air-purifying respirator filled with organic vapor cartridge(s).

For concentrations > 10 and the lower of either < 100 times the acceptable level or < the IDLH: Use Type C full facepiece supplied-air respirator operated in pressure-demand or continuous-flow mode.

For concentrations >= 100 times the acceptable level or IDLH level or unknown concentration (such as in emergencies): Use self-contained breathing apparatus with full facepiece in pressure-demand mode. Type C positive-pressure full facepiece supplied-air respirator with an auxiliary positive-pressure self-contained breathing apparatus escapi system.

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

Print date – November 6th, 1998 4:33 a.m. 3820 PG1A X0H21001 – 229.8 (15/9/2:55)

INHALATION: (Continued)

For escape: Use self-contained breathing apparatus with full facepiece or any respirator specifically approved for escape.

EXPOSURE GUIDELINES:

ACETIC ACID (64-19-7)

OSHA PEL	ACGIH TLV	CEL WEL
25 MG/M3 (PEL)	37 MG/M3 (STEL)	None
10 PPM (PEL)	15 PPM (STEL)	None
None	25 MG/M3 (TWA)	None
None	10 PPM (TWA)	None

Celanese has adopted the ACGIH TLV.

1990 NIOSH IDLH*: 1000 ppm
1994 NIOSH IDLH: 50 ppm

*Recognized by OSHA.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE :
Clear, colorless mobile liquid.
ODOR :
Strong, acrid, vinegar-like odor.
PHYSICAL STATE :
Liquid
VAPOR PRESSURE : 11.4
mm Hg @ 20 C
VAPOR DENSITY : 2.07
Air = 1 @ 20 C
BOILING POINT : 118.1 C (244.6 F)
(760 mm Hg)
FREEZING POINT : 16.6 C (61.9 F)
SOLUBILITY :
Complete @ 20 C
SPECIFIC GRAVITY : 1.051
H2O =1 @ 20/20 C

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

EVAPORATION RATE : 1.0
BuAc = 1
% VOLATILES : 100.0
MOLECULAR WEIGHT : 60.0

10. STABILITY and REACTIVITY

CHEMICAL STABILITY:
Stable.

CONDITIONS TO AVOID:
Flame.

INCOMPATIBILITY:
Oxidizing agents, for example, hydrogen peroxide, nitric acid, perchloric acid or chromium trioxide; strong alkalis such as sodium hydroxide.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon monoxide.

HAZARDOUS POLYMERIZATION:
Will not occur.

11. TOXICOLOGICAL INFORMATION

Oral LD50 : 3.3 g/kg (rats); slightly toxic to animals.

Dermal LD50 : 1.1 g/kg (rabbits); moderately toxic to animals by absorption.

Inhalation LCLo : 16,000 ppm (rats, 4 hrs.); practically non-toxic to animals.

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Date: November 5 1998

12. ECOLOGICAL INFORMATION

This information is being researched.

13. DISPOSAL CONSIDERATIONS

Note: This information applies to the manufactured product.

All notification, clean-up and disposal should be carried out in accordance with federal, state and local regulations. Preferred methods of waste disposal are incineration or biological treatment in federal/state approved facility.

Hazardous waste (40 CFR 261): Yes; D001, D002.

14. TRANSPORT INFORMATION

US Department of Transportation

Shipping name	:	ACETIC ACID, GLACIAL
Hazard class	:	8, Corrosive Material
Subsidiary hazard	:	3, Flammable Liquid
United Nations no.	:	UN2789
Packing group	:	II
North American ER Guide	:	132
DOT Reportable Quantity (RQ)	:	5000 lb/2270 kg

Canadian Transportation of Dangerous Goods:

Classification	:	Corrosive 8 (9.2)
Subsidiary hazard	:	Flammable Liquid 3

15. REGULATORY INFORMATION

RECIPIENT MUST COMMUNICATE ALL PERTINENT INFORMATION HEREIN TO EMPLOYEES AND CUSTOMERS.

STATE REGULATIONS

The following chemicals associated with the product are subject to the right-to-know regulations in these states:
ACETIC ACID (64-19-7): CT, FL, IL, MA, NJ, NY, PA, RI

TRANSPORTATION EMERGENCY	800 424 9300	IN U.S., CHEMTREC - 24 HRS/DAY
PRODUCT EMERGENCY:	800 935 5235	CELANESE - 24 HRS/DAY
PRODUCT INFORMATION:	972 443 4000	(7:30 AM TO 4:15 PM, CST)

AAC100 - ACETIC ACID GLACIAL

Celanese

Product Name: ACETIC ACID, GLACIAL
Product Code: 111113
MSDS Number : 2
Version Data: November 5 1998

15. REGULATORY INFORMATION (Continued)

U.S. FEDERAL REGULATIONS

We certify that all components are either on the TSCA inventory or qualify for an exemption.

ENVIRONMENTAL:

CERCLA :
ACETIC ACID 99.85% (64-19-7)
SARA 304 :
ACETIC ACID 99.85% (64-19-7)

INTERNATIONAL REGULATIONS

WHMIS INGREDIENT DISCLOSURE LISTED COMPONENTS:

WEMIS CLASSIFICATION: Class B, Division 3; Class E; Class D, Division 2, Subdivision B.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

16. OTHER INFORMATION

MSDS prepared by: Celanese Product Stewardship Department

DISCLAIMER:

The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Celanese, Ltd. makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid, or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards. Material safety data sheets are provided on the Internet by Celanese, Ltd. as a service to its customers. Possession of an Internet MSDS does not indicate that the possessor of the MSDS was a purchaser or user of the subject product.

RETURN TO MENU

TRANSPORTATION EMERGENCY	800 424 9300	IN U.S., CHEMTREC - 24 HRS/DAY
PRODUCT EMERGENCY:	800 835 5235	CELANESE - 24 HRS/DAY
PRODUCT INFORMATION:	972 443 4000	(7:30 AM TO 4:15 PM, CST)

PEROXYACETIC ACID
MATERIAL SAFETY DATA SHEET

124289

MATERIAL SAFETY DATA SHEET

Peracetic Acid 35%

FMC

MSDS Ref. No: 79-21-0
Version: US/Canada
Date Approved: 10/20/1998
Revision No: 5

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Peracetic Acid 35%
SYNONYM(s): Peroxyacetic Acid, Acetyl Hydroperoxide
GENERAL USE: Used as an oxidizing agent for a variety of organic reactions.

MANUFACTURER

FMC Corporation
Active Oxidant Division
1735 Market Street
Philadelphia, PA 19103
General Information: (215) 299-6000

Emergency Telephone Numbers:

CHEMTREC (800) 424-9300
Emergency Phone (303) 595-9048
(Medical) Call Collect
Emergency Phone (716) 879-0400
(Plant/Other) Call Collect

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS #	Wt.%
Peroxyacetic Acid	79-21-0	35.5
Hydrogen Peroxide	7722-84-1	6.5
Acetic Acid	64-19-7	40
Sulfuric Acid	7664-93-9	1
Water	7732-18-5	17

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: Flammable oxidizer: Stabilized peracetic acid decomposes under fire conditions to release oxygen that intensifies the fire. Use water to keep fire-exposed containers cool.

POTENTIAL HEALTH EFFECTS: Liquid and mist are corrosive (causing burns); direct contact could cause irreversible damage to eyes including blindness and/or irreversible destruction of skin tissue. Vapor/mist will irritate nose, throat and lungs but will usually subside when exposure ceases.

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. Obtain immediate medical attention. Contact a medical doctor if necessary.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

NOTES TO MEDICAL DOCTOR: This product can be corrosive to skin, eyes and mucous membranes. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: Approximately 115°F (46°C) - closed cup

FLAMMABLE LIMITS: Not available

AUTOIGNITION TEMPERATURE: 218°C (424°F)

EXTINGUISHING MEDIA: Use water to keep fire exposed containers cool.

EXPLOSION HAZARDS: Flammable - oxidizer - decomposition releases oxygen that can initiate or promote combustion.

FIRE FIGHTING PROCEDURES: Use flooding quantities of water only. Use water spray to keep fire exposed containers cool. Fight fire from protected location or maximum distance. Chemical type extinguishers are not effective with peracetic acid or hydrogen peroxide. Use proper personal protective equipment and positive pressure self contained breathing apparatus.

SENSITIVITY TO STATIC DISCHARGE: Not available

SENSITIVITY TO IMPACT: Not available

HAZARDOUS DECOMPOSITION PRODUCTS: Oxygen that supports combustion and acetic acid.

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Approach release from upwind. Stop or control leak using special protective clothing and positive pressure self-contained breathing apparatus. Control run off and isolate discharged material for proper disposal. Do not allow undiluted material to enter storm or sanitary sewer systems.

7. HANDLING AND STORAGE

HANDLING: Transfer product from drums to process in closed system (hermetically) and if not possible use effective local exhaust ventilation. Empty drum as thoroughly as possible. Triple rinse before disposal. Avoid contamination; impurities accelerate decomposition. Never return product to original container.

STORAGE: Do not store near reducing agents, fuels or other non-compatible materials. Store in a cool (less than 86°F), dry, well ventilated area. Do not store in direct sunlight, or near sources of ignition or heat. Do not double stack. Use first in, first out storage system. Containers must be vented.

COMMENTS: VENTILATION: Provide mechanical local exhaust ventilation to prevent release of mist into the work area. If ventilation is inadequate or not available use acid gas cartridge or canister with full facepiece.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	TWA (ACGIH)	STEL/Ceiling (ACGIH)	PEL (OSHA)	STEL/Ceiling (OSHA)
Hydrogen Peroxide	1 ppm		1 ppm	
Acetic Acid	10 ppm	15 ppm	10 ppm	
Sulfuric Acid			1 mg/m3	3 mg/m3 STEL

ENGINEERING CONTROLS: Provide mechanical local exhaust ventilation to prevent release of mist into the work area. If release is expected use respiratory protection.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use cup type chemical goggles. Full face shield may be used.

RESPIRATORY: Use approved acid/gas cartridge or canister with full facepiece unless break-through occurs, then use airline supplied or self contained breathing apparatus with full facepiece.

PROTECTIVE CLOTHING: Rubber or neoprene gloves and footwear. Rubber or neoprene aprons or full protection clothing.

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9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Sharp, pungent, vinegar like odor

APPEARANCE: Colorless liquid

pH: Less than 1

PERCENT VOLATILE: 99

VAPOR PRESSURE: 20 mm Hg @ 25°C

VAPOR DENSITY: (Air = 1): Not available

BOILING POINT: About 107°C (225°F)

MELTING POINT: -44°C (-47°F)

SOLUBILITY IN WATER: (% by wgt.) @ 25°C (77°F): 100

EVAPORATION RATE: (Butyl Acetate = 1) Above 1

DENSITY: Not available

SPECIFIC GRAVITY: (H_2O=1): 1.13 @ 20°C

COEFF. OIL/WATER: Not available

ODOR THRESHOLD: Not available

OXIDIZING PROPERTIES: Strong oxidizer

COMMENTS: pH (1% solution) @ 25°C: 2-3
Self Accelerating Decomposition Temperature (SADT) > 55°C (55 gallon drum)

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Open flames, elevated temperatures, any source of heat, combustibles such as paper and wood and contamination.

STABILITY: Stable (contamination or heat could initiate decomposition).

POLYMERIZATION: Will not occur

HAZARDOUS DECOMPOSITION PRODUCTS: Acetic acid and oxygen that supports combustion.

INCOMPATIBLE MATERIALS: Dirt, alkali, reducing agents, organics and heavy metals such as iron, copper, chromium, aluminum, cobalt and caustic.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
No data available for the product.
17% Peracetic Acid: Severely irritating, corrosive (rabbit) [FMC Study I83-719]

SKIN EFFECTS:
No data available for the product.
17% Peracetic Acid: Severely irritating, corrosive (rabbit) [FMC Study I83-720]

DERMAL LD_{50}:
No data available for the product.

17% Peracetic Acid: LD50 >200 mg/kg (rabbit) [FMC Study I83-721]

ORAL LD_{50}: <500 mg/kg, >50 mg/kg [FMC Study I86-935]

INHALATION LC_{50}: No data available for the product.
5% PAA: LC50 = 4080 mg/m³ (4157 ppm) (rat, 4 hr.) [FMC Reference I96-2138]
100% PAA: LC50 = 204 mg/m³ (66 ppm) (rat, 4 hr.) [FMC Reference I96-2138]

TARGET ORGANS: Eyes, skin, nose, throat, lungs

ACUTE EFFECTS FROM OVEREXPOSURE: No data available for the product. Liquid may cause severe burns and irreversible tissue damage to eyes, including blindness. Inhalation of peracetic acid vapors causes lacrimation and irritation of the mucous membranes, eyes and nasal passages.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product. Product contains hydrogen peroxide. There are reports of limited evidence of carcinogenicity of hydrogen peroxide to mice administered high concentrations in their drinking water (IARC Monograph 36, 1985). However, the International Agency for Research on Cancer concludes that hydrogen peroxide could not be classified as to its carcinogenicity to humans (Group III Carcinogen).

CARCINOGENICITY

Chemical Name	NTP Status	IARC Status	OSHA Status	Other
Hydrogen Peroxide	Not listed	Not listed	Not listed	(ACGIH) Listed (A3, Animal Carcinogen)
Sulfuric Acid	Not listed	Listed	Not listed	Not listed (ACGIH)

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: No data available for the product.
5% Peracetic Acid: 96-hr. LC50 = 1.6 mg/L (Rainbow trout) [FMC I95-2023] 96-hr. LC50 = 1.1 mg/L (Bluegill sunfish) [FMC I95-2029]
48-hr. EC50 = 0.73 mg/l (Daphnia magna) [FMC I95-2021]
120-hr. EC50 = 0.18 mg/L (Selenastrum, green algae) [FMC I95-2027]

CHEMICAL FATE INFORMATION: Peracetic acid is completely miscible with water. Aqueous solutions of peracetic acid hydrolyzes to acetic acid and hydrogen peroxide with a half life of 3-5 days.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dilute with at least twenty volumes of water and allow the hydrogen peroxide it contains to decompose, followed by discharge to a suitable treatment system in accordance with appropriate governmental regulations.

14. TRANSPORT INFORMATION

U.S. DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Organic Peroxide Type E, Liquid, (35% Peroxyacetic Acid, Stabilized)

PRIMARY HAZARD CLASS/DIVISION: 5.2, Subsidiary: 8 and 3

UN/NA NUMBER: UN 3107

PACKING GROUP: II

PLACARDS: 5.2 Organic Peroxide

LABEL: 5.2 Organic Peroxide (Sub Risk (8) Corrosive (3) Flammable)

OTHER SHIPPING INFORMATION:
DOT Marking: Organic Peroxide Type E, Liquid (35% Peroxyacetic Acid, Stabilized), UN 3107
Hazardous Substance/RQ: Not applicable
49 STCC Number: Not applicable

Material is shipped in 30 gal. (250 lb.) and 55 gal. (450 lb.) vented polyethylene containers.

SPECIAL SHIPPING NOTES: IMDG: Organic Peroxide Type E, Liquid (35% Peroxyacetic Acid, Stabilized)
IATA: Organic Peroxide Type E, Liquid (35% Peroxyacetic Acid, Stabilized)

Dike any spills. Protect against damage. Use proper personal protective equipment and positive pressure self contained breathing apparatus when handling spills or leaks.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 311 HAZARD CATEGORY (40 CFR 370): Fire Hazard, Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370): 500 lbs.

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): Listed (Peracetic Acid, Sulfuric Acid)

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355): Peracetic Acid: Planning Threshold = 500 lbs.; Sulfuric Acid: Planning Threshold = 1000 lbs.

SECTION 302.4 REPORTABLE QUANTITY (40 CFR 355) The following is a list of the ingredients that are listed.

Chemical Name	RQ
Peroxyacetic Acid	500 lbs.
Sulfuric Acid	1000 lbs.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA REGULATORY (40 CFR 302.4): Listed (Acetic Acid), Category D; (Sulfuric Acid), Category C
15 % Peracetic Acid (Unlisted), RQ = 100 lbs., Ignitability, Corrosivity

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT): Listed.

Chemical Name	Wt.%	RQ
Acetic Acid	40	5000 lbs.
Sulfuric Acid	1	1000 lbs.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS (40 CFR 710): Listed

RCRA STATUS: Waste No. D001 Waste No. D002

CANADA

WHMIS (WORKER HAZARDOUS MATERIALS INFORMATION SYSTEM): Product Identification No.: 3107
Hazard Classification: Class D, Div. 2, Subdiv. B, Class E (Corrosive), Class C (Oxidizer), Class B (Flammable)
Ingredient Disclosure List: Listed

16. OTHER INFORMATION

REVISION SUMMARY Revision #: 5

This MSDS replaces the October 12, 1998 MSDS. Any changes in information are as follows:
In Section 2
Composition/Information on Ingredients

HMIS RATING

HEALTH:	3
FLAMMABILITY	2
REACTIVITY:	2
PROTECTION:	H

NFPA RATING

HEALTH:	3
FLAMMABILITY	2
REACTIVITY:	2
SPECIAL:	OX

Key
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

HMIS RATINGS NOTES: Protection = H (Safety goggles, gloves, apron and a vapor respirator)

GENERAL STATEMENTS: NFPA - Class III Organic Peroxide

The contents and format of this MSDS are in accordance with OSHA Hazard Communication Standard and Canada's Workplace Hazardous Information System (WHMIS).

Section(s) Revised : New Format

National Fire Protection Association (NFPA)

SPECIAL = OX (Oxidizer)

OCTANOIC ACID
MATERIAL SAFETY DATA SHEET

Akzo Nobel Chemicals Inc.

MATERIAL SAFETY DATA SHEET

190280
1900 24

DATE PRINTED: 9/12/1997

MSDS NO. 15-058531

KORTACID 0899

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

PRODUCT NAME
KORTACID 0899

CHEMICAL NAME
n-Octanoic acid

SYNONYM
Caprylic acid

CHEMICAL FORMULA
C7 H15 COOH

CAS #
124-07-2

CHEMICAL FAMILY
Fatty acid

MANUFACTURERS NAME
Akzo Nobel Chemicals Inc.

PRODUCT/TECHNICAL INFORMATION
1-800-906-9977

ADDRESS
Industriestrasse 10
Emmerich, 46446

MEDICAL/HANDLING EMERGENCY
1-914-693-6946

COUNTRY
GERMANY

TRANSPORTATION EMERGENCY
CHEMTREC 1-800-424-9300

PRODUCT USE
Industrial & Institutional

REVISION DATE
7/23/1996

ISSUE DATE
10/18/1994

REVISION NO.
004

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE DESCRIPTION	PERCENT	CAS#
Octanoic acid	98.000-100.000	124-07-2
Hexanoic acid	0.001- 2.000	142-62-1
Decanoic acid	0.001- 2.000	334-48-5

SECTION 3. HAZARDS IDENTIFICATION

Appearance & Odor
Clear, yellow liquid with a slight, unpleasant, rancid odor.

STATEMENT OF HAZARDS
DANGER!
CAUSES SKIN AND EYE BURNS.

Fire & Explosion Hazards
This product is not defined as flammable or combustible. However, under fire conditions it may support combustion and decompose to give off toxic materials such as carbon monoxide and carbon dioxide. This product is not sensitive to static discharge.

Primary Route of Exposure
Skin and eye contact are the primary routes of exposure to this product.

Inhalation Acute Exposure
Due to it's low vapor pressure, this product is not likely to present an inhalation hazard at normal temperatures. At elevated temperatures, vapors may cause irritation of the respiratory tract.

Skin Contact - ACUTE
Skin contact can cause severe irritation or burns with redness, swelling, and blistering.

Akzo Nobel Chemicals Inc.

MATERIAL SAFETY DATA SHEET

SECTION 3. HAZARDS IDENTIFICATION (CONTINUED)

Eye contact - ACUTE
Eye contact can cause severe irritation or burns. May cause permanent eye damage if not flushed out immediately.

Ingestion - ACUTE
Ingestion of this material can cause severe irritation or burns of the mouth, throat, esophagus, and stomach.

CARCINOGENICITY

IARC	....NO	OSHA	....NO
NTP	....NO	ACGIH	....NO

SECTION 4. FIRST AID MEASURES

Inhalation First Aid
Inhalation is unlikely; however, if it does occur, remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, administer oxygen. Get medical attention.

Skin Contact - First Aid
Immediately remove contaminated clothing and shoes. Remove material from skin by patting or blotting with a clean cloth. DO NOT WIPE OR RUB MATERIAL FROM SKIN. Flush remaining material from skin with water, and then wash skin thoroughly with soap and plenty of water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention. Wash contaminated clothing before reuse. Thoroughly clean contaminated shoes before reuse or discard as necessary.

Eye Contact - First Aid
Immediate first aid is required to prevent eye damage. If victim is wearing contact lenses, remove them. Take care not to contaminate the victim's healthy skin and eyes. Immediately flush the eye(s) with large quantities of running water for a minimum of 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. DO NOT let the victim rub the eyes. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Oils and ointments should not be used at this time. Continue flushing with water or normal saline solution, if available, for an additional 15 minutes if a physician is not immediately available.

Ingestion - First Aid
DO NOT induce vomiting. If victim is conscious and alert, give plenty of water to drink. Call a physician or a poison control center immediately. If vomiting occurs, keep head below hips to reduce risk of aspiration. Give victim water again. Never give anything by mouth to a person who is unconscious or convulsing. Get medical attention immediately.

Medical conditions aggravated
There are no data available that address medical conditions that are generally recognized as being aggravated by exposure to this product.

Note to Physician
Attending physician should treat exposed patients symptomatically. Chemical burns on the skin should be treated as thermal burns. Skin reactions may take 24-48 hours to develop. Flush eyes with buffered or plain irrigating solutions. If any ulceration or conjunctival injury is present, have an ophthalmologist examine the patient. Iced water helps relieve pain and swelling of both the skin and eyes.

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MATERIAL SAFETY DATA SHEET

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT
269.60 F 132.00 C

FLASH METHOD
Pensky-Martens Closed Cup

AUTO IGNITION TEMPERATURE
572.00 F 300.00 C
Greater than

UPPER EXPLOSION LIMIT
N/D

LOWER EXPLOSION LIMIT
N/D

Extinguishing Media
Use water spray, dry chemical, carbon dioxide, or foam extinguishing agents. Direct application of high pressure water streams may splatter burning material.

Fire Fighting Procedures
As in any fire, prevent human exposure to fire, smoke, fumes, or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear positive pressure/pressure demand, self-contained breathing apparatus and impervious protective clothing. If possible remove containers from the fire area. Keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard. Dike fire water for later disposal. Do not allow contaminated water to enter waterways.

Fire & Explosion Hazards
This product is not defined as flammable or combustible. However, under fire conditions it may support combustion and decompose to give off toxic materials such as carbon monoxide and carbon dioxide. This product is not sensitive to static discharge.

Other Fire + Explosion Hazards
No other explosion hazards of this product are known.

Hazardous Products/Combustion
Thermal decomposition of this product may produce toxic oxides of carbon.

NFPA HEALTH RATING
3

NFPA FLAMMABILITY RATING
1

NFPA REACTIVITY RATING
0

NFPA OTHER
ND

SECTION 6. ACCIDENTAL RELEASE MEASURES

Cleanup
Isolate spill area and restrict non-essential personnel from area. All personnel involved in spill cleanup should follow good industrial hygiene practices. Wear protective clothing to prevent eye and skin contact. Use adequate ventilation and/or wear a NIOSH-approved organic vapor respirator with dust, mist, and fume filter to minimize inhalation exposure. Stop source of spill if this is possible without being injured.

If the material is in a liquid phase, small spills should be absorbed with a suitable, inert material (e.g., sand or earth). Remove the absorbed material and place in an appropriate chemical waste container for disposal. Flush the spill area with detergent and water.

Large spills should be diked to prevent spreading. Pump spilled

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MATERIAL SAFETY DATA SHEET

SECTION 6. ACCIDENTAL RELEASE MEASURES (CONTINUED)

material to salvage according to a predetermined plan. Remove residual material and flush spill area with detergent and water.

SECTION 7. HANDLING AND STORAGE

Handling
Wear protective equipment when handling this product to prevent eye and skin contact.

Use approved equipment for transport of containers to avoid puncturing or rupturing containers. Do not use air pressure to empty containers.

Emptied container may retain product residues. Follow all warnings and precautions even after container is emptied.

Storage
Store away from foodstuffs or animal feed. Containers should be stored in a cool, dry, well-ventilated area away from strong bases and strong oxidizers. Containers which have been opened should be tightly closed when returned to storage. If outdoor storage is unavoidable, containers should be placed in an area shielded from the sun and other elements. Exercise due caution to prevent damage to or leakage from the container.

MAXIMUM STORAGE TEMPERATURE
122.00 F 50.00 C
for bulk material

General Comments
It is recommended that drums be kept sealed if stored for any length of time, and resealed if only a portion of the contents are used. If fatty acids are to be stored in tanks for long durations it may be advisable to blanket them with an inert gas such as nitrogen.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection
Respiratory protection generally is not required; however, if use conditions (e.g., elevated temperature) generate vapors or mist, use NIOSH-approved organic vapor/acid gas respirator with dust, mist and fume filter to reduce potential for inhalation exposure. Where exposure potential necessitates a higher level of protection, use a NIOSH-approved, positive-pressure/pressure-demand, air-supplied respirator.

Respirator cartridges or canisters must be changed frequently (following each use or at the end of the workshift) to assure break-through exposure does not occur.

Skin Protection
Skin contact with this product should be prevented through the use of suitable protective clothing, gloves, and footwear selected with regard for use condition exposure potential. Protective equipment made of neoprene or nitrile rubber is recommended.

Eye Protection
Eye contact with this product may cause severe irritation or chemical burns of the eyes, and possibly permanent eye damage. Chemical goggles and/or a face shield must be worn when handling this product.

MATERIAL SAFETY DATA SHEET

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

Ventilation protection
Special ventilation is usually not required under normal use conditions. General plant ventilation should be adequate in most cases.

Other Protection
Safety showers, with quick opening valves which stay open, and eye wash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather. Long sleeved clothing may be used to minimize skin contact.

APPLICABLE EXPOSURE LIMITS
Other than any exposure limits which may be displayed in Section 8, there are no other known exposure limits applicable to this product or its components.

EXPOSURE LIMITS/REGULATORY INFORMATION (IN MG/M3)

SUBSTANCE DESCRIPTION	REG. AGCY	PEL	TLV	-TWA	STEL	CEIL
Octanoic acid						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D
Hexanoic acid						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D
Decanoic acid						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D

LEGEND:

EXPOSURE LIMIT DESCRIPTIONS
CEIL Ceiling Exposure Limit
PEL Permissible Exposure Limit
STEL Short Term Exposure Limit
TLV Threshold Limit Value
TWA Time Weighted Average
N/D = Not Determined