

ORION MATERIAL SAFETY DATA SHEET

ORION RESEARCH INCORPORATED
 THE SCHRAFFT CENTER
 529 MAIN STREET, BOSTON, MA 02129 USA

TELEPHONE: 617-242-3900

I. PRODUCT IDENTIFICATION EFFECTIVE DATE: 8/5/89

PRODUCT NAME: ORION APPLICATION SOLUTION ACID BUFFER
 CATALOG NO.: 956410
 HAZARDOUS SHIPMENT LABELLING: DOT: IATA:
 BOTH: CORROSIVE UN 2837

PREPARED BY: THOMAS FLYNN QUALITY ASSURANCE CHEMIST
 APPROVED BY: LYNN ORLOWITZ DIRECTOR REGULATORY MATTERS

II. HAZARDOUS INGREDIENTS (IDENTITY INFORMATION)

HAZARDOUS COMPONENTS*	CAS NO.	%	OSHA PEL	ACGIH TLV	LD50 MG/KG
SODIUM HYDROGEN SULFATE (NAHSO4)	7681-38-1	5.3	NONE LISTED	NONE LISTED	NA
**DE-IONIZED WATER (H2O)	NONE	82.7	NONE	NONE	NA*
**SODIUM SULFATE (NA2SO4)	7757-82-6	11.0	NONE	NONE	5989 (ORL-RAT)
**GLYCERIN (C3H8O3)	56-81-5	1.0	NONE	NONE	4090 (ORL-MUS)

III. PHYSICAL DATA

BOILING POINT 760 MMHG:	100 DEG C	FREEZING POINT:	-10 C
SPECIFIC GRAVITY (H2O=1):	1.1	VAPOR PRESSURE @:	NA
PH @ 25 C:	1.2 - 1.8*	SOLUBILITY IN WATER, % BY WT. @:	MISCIBLE
VOLATILES, % BY WT.:	NA	EVAPORATION RATE	(BUTYL ACETATE=1): NA
VAPOR DENSITY (AIR = 1):	NA	APPEARANCE AND ODOR:	CLEAR, ODORLESS, LIQUID

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NA AUTOIGNITION: NA

FLAMMABLE LIMITS IN AIR, % BY VOLUME: NA LOWER: NA UPPER: NA

EXTINGUISHING MEDIA: DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES: SELF CONTAINED BREATHING APPARATUS SHOULD BE WORN.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

*CHEMICALS WHICH ARE NOT CLASSIFIED AS HAZARDOUS PER U.S. OSHA GUIDELINES (29 CFR PARTS 1915.2 OR 1916.2) OR THE MASSACHUSETTS SUBSTANCE LIST (105CMR670.000 APPENDIX A), WILL NOT NECESSARILY BE LISTED ON THIS FORM EVEN THOUGH ONE OR MORE MAY BE A CONSTITUENT OF THIS PRODUCT.
 LIABILITY IS EXPRESSLY DISCLAIMED FOR ANY LOSS OR INJURY ARISING OUT OF THE USE OF THIS INFORMATION OR THE USE OF MANY MATERIALS DESIGNATED, SAFE USE OF THE MATERIALS IS THE RESPONSIBILITY OF THE USER.
 *NA=NOT AVAILABLE/NOT APPLICABLE
 **=NON HAZARDOUS COMPONENT

DOCUMENT NO. 205433-001 REV. C
 ORION
 RESEARCH
 INCORPORATED

CATALOG NO.: 956410

PRODUCT NAME: ORION APPLICATION SOLUTION ACID BUFFER

V. REACTIVITY DATA

STABILITY: STABLE
 CONDITIONS TO AVOID: HEAT, FIRE, STEAM
 INCOMPATIBILITY (MATERIAL TO AVOID): ACETIC ACID, NH4OH, METALS, HC1O4, BRF5, FULMINATES, ISOPRENE, NAOH, STEEL, STYRENE, (ACETONE = K2CR2O7), PERMANGANATES.
 HAZARDOUS DECOMPOSITION PRODUCTS: TOXIC GASES AND VAPORS MAY BE RELEASED IF HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: HEATING.

VI. HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: INHALATION: YES SKIN: YES
INGESTION: YES
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: RAPID DESTRUCTION OF TISSUE, CAN CAUSE SEVERE BURNS. INTERNAL: MAY BURN DIGESTIVE TRACT. INHALATION - MAY CAUSE LOSS OF CONSCIOUSNESS WITH DAMAGE TO LUNG TISSUE. CHRONIC: NO SYSTEMIC EFFECTS FROM INGESTIONS OF SMALL AMOUNTS SKIN-DERMATITIS AND BURNS. INHALATION -BRONCHITIS, INFLAMATION OF UPPER RESP. TRACT.

CARCINOGENICITY: NTP? IARC MONOGRAPHS? OSHA REGULATED?
NOT FOUND ON THESE LISTS.
SIGNS AND SYMPTOMS OF EXPOSURE: SEVERE BURNS. COUGHING OF THE MUCOUS MEMBRANES OF THE EYES AND UPPER RESPIRATORY TRACT.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: DERMATITIS, HEART AND RESPIRATORY CONDITIONS.

EMERGENCY AND FIRST AID PROCEDURES: IRRIGATE CONTACT AREA IMMEDIATELY WITH LARGE AMOUNTS OF WATER. NEUTRALIZE CONTACT AREA ONLY AFTER BODY HAS BEEN WASHED THOROUGHLY WITH RUNNING WATER. INHALATION-ARTIFICIAL RESPIRATION, FRESH AIR. INTERNAL -DO NOT INDUCE VOMITING.. GIVE WATER OR MILK. CONSULT PHYSICIAN FOR ALL TYPES OF EXPOSURE.

VII. PRECAUTIONS (SAFE HANDLING AND USE)

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: COVER SURFACE WITH SLAKED LIME MIXTURE, ADD WATER TO FORM A SLURRY. SCOOP UP AND SET ASIDE FOR WASTE DISPOSAL.

WASTE DISPOSAL METHOD: NEUTRALIZE WITH SLAKED LIMEMIXTURE, DILUTE AND WASH DOWN DRAIN. OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP WELL SEALED. STORE IN COOL, DRY AREA. KEEP AWAY FROM ORGANICS, ACIDS, BASES, SARA TITLE III: NAHSO4 IS LISTED IN PART 172 49 CFR.

OTHER PRECAUTIONS: WEAR PROTECTIVE CLOTHING AND SAFETY GOGGLES WHEN WORKING WITH PRODUCT. NFPA RATING: SCALE (0-4) HEALTH 2, FIRE 0, REACTIVITY 0, SPECIFIC ACID.

VIII. CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): 100MG/M3: SAF PD, PP, CF

VENTILATION

LOCAL EXHAUST: YES SPECIAL: FUME HOOD
MECHANICAL (GENERAL): NONE OTHER: NO

PROTECTIVE GLOVES: YES EYE PROTECTION: SAFETY GOGGLES

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: RUBBER APRON AND LAB COAT.

WORK/HYGIENIC PRACTICES: EMERGENCY EYE WASH STATION MUST BE AVILABLE. WASH HANDS AFTER USING.

CATALOG NUMBER: 956410

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BOSTON, MA 02129 USA
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I. PRODUCT IDENTIFICATION

PRODUCT NAME: ORION APPLICATION SOLUTION ACID BUFFER

EFFECTIVE DATE: 04/29/91

HAZAROUS SHIPMENT LABELING (DOT/IATA):

BOTH: CORROSIVE UN2837

II. HAZARDOUS INGREDIENTS (IDENTIFY INFORMATION)

HAZARDOUS COMPONENTS* SPECIFIC CHEMICAL IDENTITY	CAS#	%	OSHA PEL	ACGIH TLV	LD (50MG/KG)
SODIUM HYDROGEN SULFATE (NAHSO4)	7681-38-1	5.3	NONE	NONE	NA
**SODIUM SULFATE (NA2SO4)	7757-82-6	11.0	NONE	NONE	5989 (ORL-RAT)
**GLYCERIN (C3H8O3)	56-81-5	1.0	NONE	NONE	4090 (ORL-MUS)
**DEIONIZED WATER (H2O)	7732-18-5	82.7	NONE	NONE	190,000 (ORL-RAT)

III. PHYSICAL DATA

BOILING POINT(750MMHG): 100 C FREEZING POINT: -10C
SPECIFIC GRAVITY(H2O=1): 1.1 VAPOR PRESSURE: NA*
PH @ 25 C: (1.2 - 1.8)*** SOLUBILITY IN H2O, % BY WT: MISCIBLE
VOLATILES, % BY WT: NA EVAPORATION RATE(BUAC=1): NA
VAPOR DENSITY(AIR=1): NA
APPEARANCE AND ODOR: CLEAR, COLORLESS LIQUID.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD): NA
AUTOIGNITION TEMPERATURE: NA
FLAMMABLE LIMITS IN AIR, % BY VOLUME: LEL: NA UEL: NA
EXTINGUISHING MEDIA: DRY CHEMICAL.

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(SECTION IV. CONTINUED...)
SPECIAL FIRE-FIGHTING PROCEDURES: SELF-CONTAINED BREATHING APPARATUS SHOULD BE
WORN.

UNUSUAL FIRE & EXPLOSION HAZARDS: NONE.

V. REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID: HEAT, FIRE, STEAM.

INCOMPATIBILITY (MATERIALS TO AVOID): ACETIC ACID, NH4OH, METALS, HClO4, BRF5,
FULMINATES, ISOPRENE, NAOH, STEEL, TYRENE (ACETONE+K2CR2O7), PERMANGANATES.

HAZARDOUS DECOMPOSITION PRODUCTS: TOXIC GASES AND VAPORS MAY BE RELEASED IF
HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.
CONDITION TO AVOID: HEATING.

VI. HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: INHALATION, SKIN, AND INGESTION.

HEALTH HAZARDS (ACUTE & CHRONIC):

ACUTE - RAPID DESTRUCTION OF TISSUE, CAN CAUSE SEVERE BURNS. INTERNAL: MAY BURN DIGESTIVE TRACT. INHALATION: MAY CAUSE LOSS OF CONSCIOUSNESS WITH DAMAGE TO LUNG TISSUE.

CHRONIC - NO SYSTEMIC EFFECTS FROM INGESTIONS OF SMALL AMOUNTS, SKIN-DERMATITIS AND BURNS. INHALATION: BRONCHITIS, INFLAMMATION OF UPPER RESPIRATORY TRACT.

CARCINOGENICITY: NOT FOUND ON THESE LISTS (NTP, IARC MONOGRAPHS, OSHA REGULATED)

SIGNS AND SYMPTOMS OF EXPOSURE: SEVERE BURNS. COUGHING; IRRITATION OF THE MUCOUS MEMBRANES OF THE EYES AND UPPER RESPIRATORY TRACT.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: DERMATITIS, HEART, AND RESPIRATORY CONDITIONS.

EMERGENCY AND FIRST AID PROCEDURES:

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VII. PRECAUTIONS (SAFE HANDLING & USE)

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: COVER SURFACE WITH STAKED LIME MIXTURE, ADD WATER TO FORM A SLURRY. SCOOP UP AND SET ASIDE FOR WASTE DISPOSAL.

WASTE DISPOSAL METHOD: NEUTRALIZE WITH STAKED LIME, DILUTE, AND WASH DOWN DRAIN. OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP WELL-SEALED. STORE IN COOL, DRY AREA. KEEP AWAY FROM ORGANICS, ACIDS, BASES. NFPA RATING: SCALE (0-4); HEALTH - 2, FIRE - 0, REACTIVITY - 0, SPECIFIC - ACID.

OTHER PRECAUTIONS:

WEAR PROTECTIVE CLOTHING & SAFETY GOGGLES WHEN WORKING WITH THIS PRODUCT. SARA TITLE III: NAHSO4 IS LISTED IN PART 172 49CFR AND IS SUBJECT TO SECTIONS 311 AND 312 OF SARA. NOT FOUND ON CAL. PROP 65 LISTING.

VIII. CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFIC TYPE): 100 MG/M3; SAF PD, PP, CF

VENTILATION: LOCAL EXHAUST, FUME HOOD, AND MECHANICAL (GENERAL) IF TRANSFERING.

PROTECTIVE GLOVES: YES.

EYE PROTECTION: SAFETY GOGGLES.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: RUBBER APRON AND LAB COAT.

WORK/HYGIENIC PRACTICES: EMERGENCY EYE WASH SHOULD BE AVAILABLE. WASH HANDS AFTER USING.

* CHEMICALS WHICH ARE NOT CLASSIFIED AS HAZARDOUS PER U.S. OSHA GUIDELINES (29 CFR PARTS 1915.2 OR 1916.2) OR THE MASSACHUSETTS SUBSTANCE LIST (105 CMR 670.000 APPENDIX A) WILL NOT NECESSARILY BE LISTED ON THIS FORM EVEN THOUGH ONE OR MORE MAY BE A CONSTITUENT OF THIS PRODUCT.

*NA = NOT AVAILABLE/NOT APPLICABLE
** NON-HAZARDOUS COMPONENT
***PH IS PARTIALLY BUFFERED.

LIABILITY IS EXPRESSLY DISCLAIMED FOR ANY LOSS OR INJURY ARISING OUT OF THE USE
OF THIS INFORMATION OR THE USE OF ANY MATERIALS DESIGNATED. SAFE USE OF THE
MATERIALS IS RESPONSIBILITY OF THE USER.