
MATERIAL SAFETY DATA SHEET

HELENA LABORATORIES
 1530 Lindbergh Dr./P.O. Box 752
 Beaumont, TX 77704-0752
 USA Toll Free 800-231-5663

DATE PREPARED: 11/29/2005
 REVISION: 5

1. IDENTIFICATION:

PRODUCT NAME: TITAN GEL SILVER STAIN

PRODUCT NO.: 3035

2. INGREDIENTS (THE ABOVE KIT CONTAINS THE FOLLOWING ITEMS) :

PRODUCT NUMBER	PRODUCT IDENTIFICATION (LABEL NAME)	COMMENTS
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PART 1 GEL KIT

500663 TITAN GEL SILVER STAIN BUFFER

HAZARDOUS INGREDIENT	CAS #	%	
BARBITAL	57-44-3	82.0	MSDS ATTACHED
SODIUM AZIDE	26628-22-8	5.96	MSDS ATTACHED

500667 TITAN GEL SILVER STAIN PLATE

HAZARDOUS INGREDIENT	CAS #	%	
BARBITAL	57-44-3	1.2	MSDS ATTACHED
THIMEROSAL	54-64-8	<1.0	MSDS ATTACHED

PART 2 REAGENT KIT 500669

500492 TITAN GEL SILVER STAIN FIXATIVE

HAZARDOUS INGREDIENT	CAS #	%	
GLUTARALDEHYDE, 50%	111-30-8	100.0	MSDS ATTACHED

500493 TITAN GEL SILVER STAIN ACCELERATOR NON-HAZARDOUS

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2. INGREDIENTS (THE ABOVE KIT CONTAINS THE FOLLOWING ITEMS): (CONT)

PRODUCT NUMBER	PRODUCT IDENTIFICATION (LABEL NAME)	COMMENTS
500494	TITAN GEL SILVER STAIN REDUCING AGENT	NON-HAZARDOUS
500495	TITAN GEL SILVER STAIN REAGENT I	NON-HAZARDOUS
500496	TITAN GEL SILVER STAIN REAGENT II A	
	HAZARDOUS INGREDIENT	
	SILVER NITRATE	CAS # 7761-88-8 % 100.0 MSDS ATTACHED
500497	TITAN GEL SILVER STAIN II D	
	HAZARDOUS INGREDIENT	
	*FORMALDEHYDE, 37%	CAS # NIF % 100.0 MSDS ATTACHED
500574	TITAN GEL SILVER STAIN REAGENT II C	
	HAZARDOUS INGREDIENT	
	SILICOTUNGSTIC ACID	CAS # 12027-38-2 % 100.0 MSDS ATTACHED
500589	TITAN GEL SILVER STAIN REAGENT II B	
	HAZARDOUS INGREDIENT	
	AMMONIUM NITRATE, A.C.S. REAGENT	CAS # 6484-52-2 % 100.0 MSDS ATTACHED

ATTACHED ARE THE MSDSs FOR THE ABOVE NAMED HAZARDOUS INGREDIENTS.

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DATE PREPARED: 11/29/2005
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1. IDENTIFICATION:

PRODUCT NAME: SODIUM AZIDE
 CAS #: 26628-22-8

MOLECULAR WEIGHT: 65.01
 MOLECULAR FORMULA: NA-N3

CHEMICAL FAMILY: AZIDE
 AZIDE, SODIUM * AZOTURE DE SODIUM (FRENCH) * AZYDEK SODU (POLISH) *
 KAZOE * NATRIUMAZID (GERMAN) * NATRIUMMAZIDE (DUTCH) * NCI-C06462 *
 NEMAZYD * NSC 3072 * RCRA WASTE NUMBER P105 * SMITE * SODIUM AZIDE
 (ACGIH:DOT) * SODIUM, AZOTURE DE (FRENCH) * SODIUM, AZOTURO DI
 (ITALIAN) * U-3886 * UN1687 (DOT) *

2. HAZARDOUS INGREDIENTS:

CHEMICAL NAME/COMMON NAME CAS #	%	EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
SODIUM AZIDE 26628-22-8	100.0	0.1 PPM (HN3) CEILING (SKIN)	0.3 MG/M3 (NAN3) CEILING (SKIN)

3. PHYSICAL DATA:

BOILING POINT: NA SPECIFIC GRAVITY (H₂O = 1): 1.85

VAPOR PRESSURE (MM HG.): NA MELTING POINT: 527°F (275°C)
 (DECOMPOSES)

VAPOR DENSITY (AIR = 1): 2.2 SOLUBILITY IN WATER: SOLUBLE

APPEARANCE AND ODOR: WHITE, CRYSTALLINE POWDER

NA = Not Applicable NE = Not Established
 NL = Not Listed NIF = No Information Found

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? YES SKIN? YES INGESTION? YES

OSHA REGULATED? NA

CARCINOGENICITY: NTP? NA IARC? NA

ACUTE EFFECT OF OVEREXPOSURE:

EYES: CAUSES EYE IRRITATION. CONTACT WITH DUST OR VAPOR MAY CAUSE SYSTEMIC TOXIC.

SKIN: CAUSES SKIN IRRITATION. MAY BE FATAL IF ABSORBED THROUGH THE SKIN. IF ABSORBED, CAUSES SYMPTOMS SIMILAR TO THOSE OF INGESTION.

INGESTION: MAY BE FATAL IF SWALLOWED. CAUSES GASTROINTESTINAL IRRITATION WITH NAUSEA, VOMITING AND DIARRHEA. SODIUM AZIDE MAY CAUSE HYPOTENSION (ABNORMALLY LOW BLOOD PRESSURE), TACHYCARDIA (RAPID HEART RATE), TACHYPNEA (QUICK, SHALLOW BREATHING), HYPOTHERMIA (LOW BODY TEMPERATURE), CONVULSIONS AND SEVERE HEADACHE.

INHALATION: MAY BE FATAL IF INHALED. DUST IS IRRITATING TO THE RESPIRATORY TRACT. MAY CAUSE EFFECTS SIMILAR TO THOSE DESCRIBED FOR INGESTION. RAPIDLY ABSORBED. THE VAPOR OF HYDRAZOIC ACID MAY BE PRESENT WHERE SODIUM AZIDE IS HANDLED. SYMPTOMS OF ACUTE EXPOSURE TO HYDRAZOIC ACID INCLUDE EYE IRRITATION, HEADACHE, DRAMATIC DECREASE IN BLOOD PRESSURE, WEAKNESS, PULMONARY EDEMA, AND COLLAPSE.

CHRONIC EFFECTS OF EXPOSURE:

TARGET ORGAN(S): CENTRAL NERVOUS SYSTEM, LUNGS, CARDIOVASCULAR SYSTEM, EYES, SKIN.

TOXICITY DATA:

RTECS#:VY8050000

ORL-WMN LDLO:786 MG/KG

ORL-MUS LD50:27 MG/KG

ORL-MAN LDLO:29 MG/KG

IPR-MUS LD50:28 MG/KG

ORL-MAN LDLO:129 MG/KG

SCU-MUS LD50:23060 UG/KG

ORL-MAN LDLO:14 MG/KG

IVN-MUS LD50:19 MG/KG

ORL-MAN LDLO:143 MG/KG

UNR-MUS LD50:27 MG/KG

ORL-RAT LD50:27 MG/KG

SKN-RBT LD50:20 MG/KG

SCU-RAT LD50:45100 UG/KG

ORL-BWD LD50:23700 UG/KG

ITR-RAT LD50:47500 UG/KG

4. HEALTH HAZARD DATA: (CONT)

TARGET ORGAN DATA

BRAIN AND COVERINGS (INCREASED INTRACRANIAL PRESSURE)
PERIPHERAL NERVE AND SENSATION (SPASTIC PARALYSIS WITH/WITHOUT
SENSORY SENSE ORGANS AND SPECIAL SENSES (MYDRIASIS)
BEHAVIORAL (GENERAL ANESTHETIC)
BEHAVIORAL (SOMNOLENCE)
BEHAVIORAL (CONVULSIONS OR EFFECT ON SEIZURE THRESHOLD)
BEHAVIORAL (CHANGE IN MOTOR ACTIVITY)
BEHAVIORAL (COMA)
BEHAVIORAL (HEADACHE)
BEHAVIORAL (IRRITABILITY)
CARDIAC (ARRYTHMIAS)
CARDIAC (PULSE RATE DECREASED WITH FALL IN BP)
CARDIAC (CHANGE IN FORCE OF CONTRACTION)
CARDIAC (OTHER CHANGES)
VASCULAR (BP LOWERING NOT CHARACTERIZED IN AUTONOMIC SECTION)
LUNGS, THORAX OR RESPIRATION (ACUTE PULMONARY EDEMA)
LUNGS, THORAX OR RESPIRATION (DYSPNAE)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY STIMULATION)
LUNGS, THORAX OR RESPIRATION (OTHER CHANGES)
GASTROINTESTINAL (HYPERMOTILITY, DIARRHEA)
KIDNEY, URETER, BLADDER (OTHER CHANGES)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NA

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER
OR NORMAL SALINE OCCASIONALLY LIFTING UPPER AND
LOWER LIDS UNTIL NO EVIDENCE OF CHEMICAL REMAINS
(APPROXIMATELY 15-20 MINUTES). GET MEDICAL
ATTENTION IMMEDIATELY.

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING AND SHOES
IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR
MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL
NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY
15-20 MINUTES). GET MEDICAL ATTENTION
IMMEDIATELY.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT
BREATHING GIVE ARTIFICIAL RESPIRATION. IF
BREATHING IS DIFFICULT, GIVE OXYGEN.

INGESTION: IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED
PERSON IS CONSCIOUS. CALL A PHYSICIAN.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): NA

FLAMMABLE LIMITS: LEL NA UEL NA

EXTINGUISHING MEDIA: USE DRY CHEMICAL, CARBON DIOXIDE, OR ALCOHOL-RESISTANT FOAM. DO NOT GET WATER INSIDE CONTAINERS.

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSION HAZARDS: CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS. EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

6. REACTIVITY DATA:

STABILITY: UNSTABLE: STABLE: X

INCOMPATIBILITY (MATERIALS TO AVOID): ACID CHLORIDES; HALOGENATED SOLVENTS; AVOID CONTACT WITH METALS; AVOID CONTACT WITH ACID; EXPLODES WHEN HEATED.

AZIDE REACTS WITH MANY HEAVY METALS SUCH AS LEAD, COPPER, MERCURY, SILVER, GOLD TO FORM EXPLOSIVE COMPOUNDS. COPPER AND LEAD AZIDES ARE MORE SENSITIVE THAN NITROGLYCERINE. AZIDE REACTS WITH METAL HALIDES TO GIVE A RANGE OF METAL AZIDE HALIDES, MANY OF WHICH ARE EXPLOSIVE. INCOMPATIBLE WITH CHROMYL CHLORIDE, HYDRAZINE, BROMINE, CARBON DISULFIDE, DIMETHYL SULFATE, DIBROMOMALONITRILE. AN EXPLOSION OCCURRED WHEN A MIXTURE OF SODIUM AZIDE, METHYLENE CHLORIDE, DIMETHYL SULFOXIDE, AND SULFURIC ACID WERE BEING CONCENTRATED ON A ROTARY EVAPORATOR.

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: NITROGEN OXIDES

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: EVACUATE AREA. WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE):

VENTILATION: LOCAL EXHAUST: MECHANICAL: X
OTHER:

PROTECTIVE GLOVES: CHEMICAL-RESISTANT GLOVES.

EYE PROTECTION: SPLASH-PROOF OR DUST RESISTANT SAFETY GOGGLES AND
FACESHIELD.

OTHER PROTECTIVE EQUIPMENT: SAFETY SHOWER AND EYE BATH

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: STORE AWAY FROM
INCOMPATIBLE SUBSTANCES.

OTHER PRECAUTIONS: FORMS HAZARDOUS VAPORS WHEN CONTACTED WITH ACIDS.
THRESHOLD PLANNING QUANTITY IS SARA REGULATED.

10. OTHER INFORMATION: EVEN DILUTE SOLUTIONS WHEN EXPOSED TO ACIDS
MAY FORM HAZARDOUS VAPORS.

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DATE PREPARED: 11/29/2005
 REVISION: 3

1. IDENTIFICATION:

NAME: BARBITAL
 CAS #: 57-44-3

MOLECULAR WEIGHT: 184.22
 MOLECULAR FORMULA: C8H12N2O3

CHEMICAL NAMES: 2,4,6(1H,3H,5H)-PYRIMIDENETRIONE, 5,5-DIETHYL- *
 5,5-DIETHYLBARBITURIC ACID

SYNONYMS: DIETHYLBARBITONE * DIETHYLMALONYLUREA * BARBITONE *
 VERONAL * SEDEVAL

2. HAZARDOUS INGREDIENTS:

CHEMICAL NAME/COMMON NAME CAS #	%	EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
BARBITAL 57-44-3	100.0	NA	

3. PHYSICAL DATA:

BOILING POINT: NA SPECIFIC GRAVITY (H₂O = 1): NIF
 VAPOR PRESSURE (MM HG.): NA MELTING POINT: 188-192°C
 VAPOR DENSITY (AIR = 1): SOLUBILITY IN WATER: SLIGHTLY SOLUBLE
 pH: 5
 APPEARANCE AND ODOR: WHITE CRYSTALLINE POWDER OR COLORLESS CRYSTALS

NA = Not Applicable NE = Not Established
 NL = Not Listed NIF = No Information Found

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? YES SKIN? YES INGESTION? YES

OSHA REGULATED: NA

CARCINOGENICITY: NTP? NA IARC? NA

ACUTE EFFECT OF OVEREXPOSURE: BARBITAL IS A SLEEPING DRUG. THE LETHAL DOSE FOR HUMAN IS 3-6 g.

HUMAN EFFECTS:

SYMPTOMS FOR ACUTE POISONING ARE:

- INCREASING RESTLESSNESS
- LOW BLOOD PRESSURE
- RESPIRATORY SLOW DOWN
- FIRST DILATION, LATER CONTRACTION OF THE PUPILS
- SLOW PULSE WITH A HIGH PULSE RATE
- PATIENTS DO NOT REACT TO PAIN

CHRONIC EFFECTS OF EXPOSURE: THE CHRONIC EFFECTS OF THE BARBITURATES ON NEUROLOGICAL AND PSYCHIC FUNCTIONS INCLUDE DISORIENTATION, MENTAL CONFUSION, ATAXIA, DIZZINESS, DEPRESSION, AND SKIN RASHES. CONTINUED USE OF BARBITURATES, EVEN IN THERAPEUTIC DOSES, MAY RESULT IN PSYCHIC OR PHYSICAL DEPENDENCE. ABRUPT WITHDRAWAL OF THE DRUG MAY RESULT IN A SEVERE ABSTINENCE SYNDROME WHICH INCLUDES GRAND MAL SEIZURES AND DELIRIUM.

TOXICITY DATA:	LD ₅₀ (ORAL, MUS)	600 mg/Kg
	LD ₅₀ (SCU, RAT)	450 mg/Kg
	LD ₀ (IPR, RAT)	300 mg/Kg
	LD ₀ (SCU, RBT)	250 mg/Kg

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: BARBITAL EFFECTS MAY BE INTENSIFIED BY PRESENCE OF OTHER DRUGS.

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: IN CASE OF CONTACT, FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER FOR 15 MINUTES. CALL A PHYSICIAN.

INHALATION: KEEP AIR PASSAGES OPEN; PREVENT ASPIRATION. GIVE ARTIFICIAL RESPIRATION OR OXYGEN. CALL A PHYSICIAN.

4. HEALTH HAZARD DATA (CONT)

INGESTION: IF CONSCIOUS, INDUCE VOMITING BY IPECAC SYRUP OR TWO GLASSES OF WARM WATER OR DILUTE MILK FOLLOWED BY TICKLING THE BACK OF THE THROAT WITH A TONGUE DEPRESSOR. AFTER VOMITING STOPS, GIVE PATIENT ONE OR TWO TABLESPOONFULS OF ACTIVATED CHARCOAL IN A GLASS OF WATER. CALL A PHYSICIAN.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): NA

FLAMMABLE LIMITS: LEL NE UEL NE

EXTINGUISHING MEDIA: FOAM, FOG, WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES: COMBUSTIBLE. DEVELOPMENT OF TOXIC GASES OR FUMES OF CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN OXIDES. ISOLATE HAZARD AND EVACUATE CONFINED AREAS. STAY UPWIND; AVOID SMOKE AND FUMES. USE WATER SPRAY TO WET CONTAINERS. IF SMOKE AND FUMES CANNOT BE AVOIDED, WEAR A CHEMICAL-PROOF SUIT WITH HOOD AND BREATHING AIR SUPPLY. FIGHT FIRE FROM MAXIMUM DISTANCE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

6. REACTIVITY DATA:

STABILITY: UNSTABLE: STABLE: X

INCOMPATIBILITY (MATERIALS TO AVOID): ALKALINES

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: WHEN HEATED TO DECOMPOSITION, TOXIC FUMES SUCH AS NITROGEN OXIDES ARE EMITTED.

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: SHOVEL LARGE QUANTITIES OF SPILLED MATERIAL INTO DRUMS. SWEEP UP THE SPILL AREA AND SAVE THE MATERIAL FOR RECOVERY. FLUSH THE SPILL AREA WITH DETERGENT AND WATER.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE): DUST RESPIRATOR

VENTILATION: LOCAL EXHAUST: X MECHANICAL: OTHER:

SKIN PROTECTION: PROTECTIVE GLOVES

EYE PROTECTION: SAFETY GLASSES OR GOGGLES

OTHER PROTECTIVE EQUIPMENT: NA

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: AVOID BREATHING DUST. AVOID CONTACT WITH EYE AND SKIN. WASH THOROUGHLY AFTER HANDLING.

OTHER PRECAUTIONS: NA

10. OTHER INFORMATION: NA

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DATE PREPARED: 11/22/2005
 REVISION: 4

1. IDENTIFICATION:

NAME: THIMEROSAL

CAS #: 54-64-8

MOLECULAR FORMULA: C9H10HG02S

SYNONYMS: ((O-CARBOXYPHENYL)THIO)ETHYLMERCURY SODIUM SALT * ELCIDE
 75 * ELCIDE * ETHYL(2-MERCAPTOBENZOATO-S)MERCURY SODIUM SALT * O-
 (ETHYLMERCURITHIO)BENZOIC ACID SODIUM SALT *
 ETHYLMERCURITHIOSALICYLIC ACID SODIUM SALT *
 ETHYLMERKURITHIOSALICILAN SODNY (CZECH) * ETHYL (SODIUM O-
 MERCAPTOBENZOATO)MERCURY * MERCUROTHIOLATE * MERCURY, ETHYL(2-
 MERCAPTOBENZOATE-S)-, SODIUM SALT * MERFAMIN * MERTHIOLATE *
 MERTHIOLATE SALT * MERTHIOLATE SODIUM * MERTORGAN * MERZONIN *
 MERZONIN SODIUM * MERZONIN, SODIUM SALT * SET * SODIUM ETHYLMERCURIC
 THIOSALICYLATE * SODIUM O-(ETHYLMERCURITHIO)BENZOATE * SODIUM
 ETHYLMERCURITHIOSALCYLATE * SODIUM MERTHIOLATE * THIMEROSAL *
 THIMEROSALATE * THIMEROSOL * THIMERSALATE * THIOMEROSAL * THIOMERSAL
 * THIOMERSALATE *

2. HAZARDOUS INGREDIENTS:

CHEMICAL NAME/COMMON NAME CAS #	%	EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
THIMEROSAL 54-64-8	100.0	0.1MG(HG)/M3	0.1MG(HG)/M3 SKIN

NA = Not Applicable
 NL = Not Listed

NE = Not Established
 NIF = No Information Found

3. PHYSICAL DATA:

BOILING POINT: NIF SPECIFIC GRAVITY (H2O = 1): NIF
VAPOR PRESSURE (MM HG.): NIF MELTING POINT: 232°C TO 233°C (DEC)
VAPOR DENSITY (AIR = 1): NA SOLUBILITY IN WATER: SOLUBLE
APPEARANCE AND ODOR: WHITE POWDER

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:
INHALATION? YES SKIN? YES INGESTION? YES
OSHA REGULATED? NA
CARCINOGENICITY: NTP? NA IARC? NA
ACUTE EFFECT OF OVEREXPOSURE: MAY CAUSE NERVOUS SYSTEM DISTURBANCES.
EYES: CAUSES EYE IRRITATION.
SKIN: MAY BE FATAL IF ABSORBED THROUGH THE SKIN. CAUSES SKIN IRRITATION.
INHALATION: MAY BE FATAL IF INHALED. MATERIAL IS IRRITATING TO UPPER RESPIRATORY TRACT.
INGESTION: MAY BE FATAL IF SWALLOWED. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES.
CHRONIC EFFECTS OF EXPOSURE: LABORATORY EXPERIMENTS HAVE SHOWN MUTAGENIC EFFECTS, TARGET ORGANS: KIDNEYS, CENTRAL NERVOUS SYSTEM.

TOXICITY DATA:

RTECS NO.: OV8400000

Table with 2 columns: Test Name and Value. Rows include: MERCURY, ((O-CARBOXYPHENYL)THIO)ETHYL-, SODIUM SALT; IAL-CHD LDLO 60 MG/KG/4W-I; JOPDAB 104,311,84; ORL-RAT LD50 75 MG/KG; PCOC** -,1130,66; SCU-RAT LD50 98 MG/KG; CTOXAO 4,185,71; UNR-RAT LD50 40 MG/KG; 30ZDA9 -,290,71; ORL-MUS LD50 91 MG/KG; NYKZAU 58,235,62; IPR-MUS LD50 54 MG/KG; NYKZAU 58,235,62; SCU-MUS LD50 66 MG/KG; QJPPAL 12,212,39; IVN-MUS LD50 45 MG/KG; QJPPAL 12,212,39

IRRITATION DATA

EYE-RBT 8 UG MLD AJOPAA 78,98,74

4. HEALTH HAZARD DATA (CONT):

TARGET ORGAN DATA

BEHAVIORAL (ATAXIA)

GASTROINTESTINAL (NAUSEA OR VOMITING)

KIDNEY, URETER, BLADDER (CHANGES IN TUBULES)

EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)

EFFECTS ON FERTILITY (ABORTION)

EFFECTS ON EMBRYO OR FETUS (FETAL DEATH)

TUMORIGENIC EFFECTS (UTERINE TUMORS)

NUTRITIONAL AND GROSS METABOLIC (CHANGES IN: METABOLIC ACIDOSIS)

TUMORIGENIC (NEOPLASTIC BY RTECS CRITERIA)

TUMORIGENIC (TUMORS AT SITE OF APPLICATION)

ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NA

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN IMMEDIATELY.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN IMMEDIATELY.

INGESTION: IF SWALLOWED, WASH OUT MOUTH WITH WATER, PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN IMMEDIATELY.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): > 482°F (> 250°C)

FLAMMABLE LIMITS: NA LEL NA UEL NA

EXTINGUISHING MEDIA: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

5. FIRE AND EXPLOSION HAZARD DATA (CONT):

UNUSUAL FIRE AND EXPLOSION HAZARDS: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

6. REACTIVITY DATA:

STABILITY: UNSTABLE: STABLE: X

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZING AGENTS, STRONG ACIDS, STRONG BASES. MAY DISCOLOR ON EXPOSURE TO LIGHT.

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: TOXIC FUMES OF CARBON MONOXIDE, CARBON DIOXIDE, SULFUR OXIDES, MERCURY/MERCURY OXIDES.

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETED.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE): APPROPRIATE NIOSH/MSHA - APPROVED

VENTILATION: LOCAL EXHAUST: MECHANICAL: OTHER: CHEMICAL FUME HOOD

PROTECTIVE GLOVES: CHEMICAL RESISTANT

EYE PROTECTION: SAFETY GOGGLES

OTHER PROTECTIVE EQUIPMENT: OTHER PROTECTIVE CLOTHING, SAFETY SHOWER AND EYE BATH.

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: DO NOT BREATHE DUST. AVOID CONTACT WITH EYES, SKIN AND CLOTHING, AVOID PROLONGED OR REPEATED EXPOSURE. WASH THOROUGHLY AFTER HANDLING. KEEP TIGHTLY CLOSED. LIGHT SENSITIVE. STORE IN A COOL DRY PLACE.

9. SPECIAL PRECAUTIONS (CONT):

OTHER PRECAUTIONS: WASH CONTAMINATED CLOTHING BEFORE USE.

10. OTHER INFORMATION:

POSSIBLE ALLERGIC REACTION TO DUST IF INHALED,
INGESTED OR IN CONTACT WITH SKIN.
HYPERSENSITIVITY REACTIONS MANIFESTED BY
ERYTHEMA, PAPULAR OR VESICULAR ERUPTIONS OCCUR
OCCASIONALLY. ALLERGIC CONJUNCTIVITIS HAS BEEN
REPORTED. THIS PRODUCT IS SUBJECT TO SARA
SECTION 313 REPORTING REQUIREMENTS.

The information herein is given in good faith but no warranty,
expressed or implied, is made.

MATERIAL SAFETY DATA SHEET

HELENA LABORATORIES
 1530 Lindbergh Dr./P.O. Box 752
 Beaumont, TX 77704-0752
 USA Toll Free 800-231-5663

DATE PREPARED: 11/29/2005
 REVISION: 5

1. IDENTIFICATION:

NAME: GLUTARALDEHYDE, 50%

CAS #: 111-30-8

CHEMICAL FORMULA: C5H8O2

SYNONYMS: 1,5-PENTANEDIAL * GLUTARIC ALDEHYDE

2. HAZARDOUS INGREDIENTS:

CHEMICAL NAME/COMMON NAME CAS #	%	EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
GLUTARALDEHYDE 111-30-8	50.0	0.2 PPM	0.2 PPM (CEILING)

3. PHYSICAL DATA:

BOILING POINT: 101°C (214°F) SPECIFIC GRAVITY (H₂O = 1): 1.06-1.12

VAPOR PRESSURE (MM HG.): 17 AT 20°C (PURE GLUTERALDEHYDE) MELTING POINT: -10°C

VAPOR DENSITY (AIR = 1): 3.4 (PURE GLUTERALDEHYDE) EVAPORATION RATE (BUTYL ACETATE+1): NIF

SOLUBILITY IN WATER: COMPLETE APPEARANCE AND ODOR: COLORLESS LIQUID;
SHARP ODOR

NA = Not Applicable
 NL = Not Listed

NE = Not Established
 NIF = No Information Found

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? YES SKIN? YES INGESTION? YES

CARCINOGENICITY: NTP? NO IARC? NO

ACUTE EFFECT OF OVEREXPOSURE:

EYES: CORROSIVE! VAPORS ARE IRRITATING AND MAY CAUSE DAMAGE TO THE EYES. CONTACT MAY CAUSE SEVERE BURNS AND PERMANENT EYE DAMAGE.

SKIN: CAUSES IRRITATION TO SKIN. SYMPTOMS INCLUDE REDNESS, ITCHING, AND PAIN. PROLONGED CONTACT MAY CAUSE SKIN BURNS. MAY BE ABSORBED THROUGH THE SKIN WITH POSSIBLE SYSTEMIC EFFECTS.

INHALATION: CAUSES IRRITATION TO THE RESPIRATORY TRACT. SYMPTOMS MAY INCLUDE COUGHING, SHORTNESS OF BREATH. HEATING THE SOLUTION MAY RESULT IN MORE SEVERE IRRITANT EFFECTS.

INGESTION: CAUSES IRRITATION TO THE GASTROINTESTINAL TRACT. SYMPTOMS MAY INCLUDE NAUSEA, VOMITING AND DIARRHEA. MAY CAUSE CHEMICAL BURNS OF THE MOUTH, THROAT, ESOPHAGUS AND STOMACH WITH DISCOMFORT OR PAIN IN THE CHEST AND ABDOMEN. ASPIRATION INTO THE LUNGS MAY OCCUR DURING SWALLOWING OR VOMITING, RESULTING IN LUNG DAMAGE.

CHRONIC EFFECTS OF EXPOSURE: CHRONIC EXPOSURE MAY CAUSE SKIN EFFECTS.

TOXICITY DATA: CORROSIVE

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: SOME INDIVIDUALS MAY DEVELOP AN ALLERGIC SKIN REACTION FROM EXPOSURE. PERSONS WITH PRE-EXISTING SKIN OR RESPIRATORY DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THE SUBSTANCE.

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, LIFTING LOWER AND UPPER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT: IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED

4. HEALTH HAZARD DATA (CONT):

CLOTHING AND SHOES. GET MEDICAL ATTENTION. WASH CLOTHING BEFORE REUSE. THOROUGHLY CLEAN SHOES BEFORE REUSE.

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

INGESTION: IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION IMMEDIATELY.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): NONE (SETAFLASH CLOSED CUP)

FLAMMABLE LIMITS: LEL NA UEL NA

EXTINGUISHING MEDIA: USE ANY MEANS SUITABLE FOR EXTINGUISHING SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES: IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

6. REACTIVITY DATA:

STABILITY: UNSTABLE: STABLE: X

INCOMPATIBILITY (MATERIALS TO AVOID): OXIDIZERS, ALKALIS

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: COMBUSTION WILL PRODUCE CO2 AND PROBABLY CO.

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: COLLECT LIQUID IN AN APPROPRIATE CONTAINER OR ABSORB WITH AN INERT MATERIAL (E.G., VERMICULITE, DRY SAND, EARTH), AND PLACE IN A CHEMICAL WASTE CONTAINER. DO NOT USE COMBUSTIBLE MATERIALS, SUCH AS SAWDUST. DO NOT FLUSH TO SEWER.

7. SPILL OR LEAK PROCEDURES (CONT):

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE): NIOSH-APPROVED ORGANIC VAPOR CARTRIDGE

VENTILATION: LOCAL EXHAUST: X MECHANICAL:
OTHER: GENERAL ROOM VENTILATION

PROTECTIVE GLOVES: YES

EYE PROTECTION: GOGGLES WITH FACE SHIELD RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT: PROTECTIVE CLOTHING

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: KEEP IN A TIGHTLY CLOSED CONTAINER, STORED IN A COOL, DRY, VENTILATED AREA. PROTECT AGAINST PHYSICAL DAMAGE. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (VAPORS, LIQUID).

OTHER PRECAUTIONS: NONE

10. OTHER INFORMATION:

NA

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MATERIAL SAFETY DATA SHEET

HELENA LABORATORIES
1530 Lindbergh Dr./P.O. Box 752
Beaumont, TX 77704-0752
USA Toll Free 800-231-5663

DATE PREPARED: 11/29/2005
REVISION: 4

1. IDENTIFICATION:

NAME: SILVER NITRATE

CAS #: 7761-88-8

SYNONYMS: NITRIC ACID SILVER SALT

2. HAZARDOUS INGREDIENTS:

Table with 4 columns: CHEMICAL NAME/COMMON NAME, CAS #, %, EXPOSURE LIMITS (OSHA PEL, ACGIH TLV). Row 1: SILVER NITRATE, 7761-88-8, 100, N/A, N/A.

3. PHYSICAL DATA:

BOILING POINT: 824°F SPECIFIC GRAVITY (H2O = 1): 4.35
VAPOR PRESSURE (MM HG.): N/A MELTING POINT: 212°C (414°F)
VAPOR DENSITY (AIR = 1): N/A EVAPORATION RATE (BUTYL ACETATE=1): N/A
SOLUBILITY IN WATER: APPRECIABLE APPEARANCE AND ODOR: WHITE OR COLORLESS CRYSTALS

NA = Not Applicable NE = Not Established
NL = Not Listed NIF = No Information Found

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? X SKIN? X INGESTION? X

CARCINOGENICITY: NTP? NO IARC? NO

ACUTE EFFECT OF OVEREXPOSURE:

EYES: CAUSES EYE BURNS. MAY CAUSE CHEMICAL CONJUNCTIVITIS AND CORNEAL DAMAGE.

SKIN: CAUSES SKIN BURNS. MAY CAUSE SKIN RASH (IN MILDER CASES), AND COLD AND CLAMMY SKIN WITH CYANOSIS OR PALE COLOR.

INHALATION: CAUSES SEVERE IRRITATION OF UPPER RESPIRATORY TRACT WITH COUGHING, BURNS, BREATHING DIFFICULTY, AND POSSIBLE COMA. CAUSES CHEMICAL BURNS TO THE RESPIRATORY TRACT. ASPIRATION MAY LEAD TO PULOMONARY EDEMA. MAY CAUSE SYSTEMIC EFFECTS.

INGESTION: MAY CAUSE SEVERE AND PERMANENT DAMAGE TO THE DIGESTIVE TRACT. CAUSES GASTROINTESTINAL TRACT BURNS. MAY CAUSE PERFORATION OF THE DIGESTIVE TRACT. MAY CAUSE SYSTEMIC EFFECTS. LETHAL DOSE FOR HUMANS IS 2 GRAMS.

CHRONIC AFFECTS OF EXPOSURE: MAY CAUSE METHEMOGLOBINEMIA, WHICH IS CHARACTERIZED BY CHOCOLATE-BROWN COLORED BLOOD, HEADACHE, WEAKNESS, DIZZINESS, BREATH SHORTNESS, CYANOSIS (BLUISH SKIN DUE TO DEFICIENT OXYGENATION OF BLOOD), RAPID HEART RATE, UNCONSCIOUSNESS AND POSSIBLE DEATH. EFFECTS MAY BE DELAYED. CHRONIC INHALATION OR INGESTION MAY CAUSE ARGYRIA CHARACTERIZED BY BLUE-GRAY DISCOLORATION OF THE EYES, SKIN AND MUCOUS MEMBRANES. CHRONIC SKIN CONTACT MAY CAUSE PERMANENT DISCOLORATION OF THE SKIN.

TOXICITY DATA:

LD50/LC50:

CAS# 7761-88-8:

DRAIZE TEST, RABBIT, EYE: 1 MG SEVERE;

DRAIZE TEST, RABBIT, EYE: 10 MG MODERATE;

ORAL, MOUSE: LD50 = 50 MG/KG;

ORAL, RAT: LD50 = 1173 MG/KG;

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NIF

4. HEALTH HAZARD DATA (CONT):

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: GET MEDICAL AID IMMEDIATELY. DO NOT ALLOW VICTIM TO RUB OR KEEP EYES CLOSED. EXTENSIVE IRRIGATION WITH WATER IS REQUIRED (AT LEAST 30 MINUTES).

SKIN CONTACT: GET MEDICAL AID IMMEDIATELY. IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

INGESTION: DO NOT INDUCE VOMITING. IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL AID IMMEDIATELY.

INHALATION: GET MEDICAL AID IMMEDIATELY. REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. DO NOT USE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING HAS CEASED APPLY ARTIFICIAL RESPIRATION USING OXYGEN AND A SUITABLE MECHANICAL DEVICE SUCH AS A BAG AND A MASK.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): NONE

FLAMMABLE LIMITS: LEL N/A UEL N/A

EXTINGUISHING MEDIA: USE APPROPRIATE AGENT FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

UNUSUAL FIRE AND EXPLOSION HAZARDS: FIRE OR EXCESSIVE HEAT GREATLY INCREASES THE BURNING RATE OF COMBUSTIBLE MATERIALS.

6. REACTIVITY DATA:

STABILITY: UNSTABLE: STABLE: X

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG ACIDS, STRONG BASES, STRONG REDUCING AGENTS, STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: NITROGEN OXIDES, IRRITATING AND TOXIC FUMES AND GASES, OXIDES OF SILVER.

6. REACTIVITY DATA (CONT)

HAZARDOUS POLYMERIZATION:

MAY OCCUR:

WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: VACUUM OR SWEEP UP MATERIAL AND PLACE INTO A SUITABLE DISPOSAL CONTAINER. CLEAN UP SPILLS IMMEDIATELY, OBSERVING PRECAUTIONS IN THE PROTECTIVE EQUIPMENT SECTION. AVOID GENERATING DUSTY CONDITIONS. REMOVE ALL SOURCES OF IGNITION. PROVIDE VENTILATION. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS PAPER TOWELS TO CLEAN UP SPILL.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE): IF ENGINEERING CONTROLS ARE INADEQUATE TO CONTROL DUST CONCENTRATIONS TO AN ACCEPTABLE LEVEL, A NIOSH APPROVED DUST RESPIRATOR SHOULD BE WORN IF NEEDED. IF RESPIRATORS ARE USED A PROGRAM SHOULD BE INSTITUTED TO ASSURE COMPLIANCE WITH OSHA STANDARD 29 CRF 1910.134.

VENTILATION: LOCAL EXHAUST: X OTHER:

PROTECTIVE GLOVES:

EYE PROTECTION: SAFETY GOGGLES OR EYEGASSES.

OTHER PROTECTIVE EQUIPMENT: FACE SHIELD SHOULD BE WORN.

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: WASH THOROUGHLY AFTER HANDLING. MINIMIZE DUST GENERATION AND ACCUMULATION. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. KEEP CONTAINER TIGHTLY CLOSED. DO NOT INGEST OR INHALE. USE WITH ADEQUATE VENTILATION. DO NOT STORE NEAR COMBUSTIBLE MATERIALS. DISCARD CONTAMINATED SHOES.

STORAGE: KEEP AWAY FROM SOURCES OF IGNITION. DO NOT STORE NEAR COMBUSTIBLE MATERIALS. KEEP CONTAINER CLOSED WHEN NOT IN USE. STORE IN A TIGHTLY CLOSED CONTAINER. STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES. CORROSIVES AREA.

OTHER PRECAUTIONS: WILL STAIN SKIN BLACK.

10. OTHER INFORMATION: NA

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4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? X SKIN? X INGESTION? X

CARCINOGENICITY: NTP? YES IARC? YES

ACUTE EFFECT OF OVEREXPOSURE:

EYES: CAUSES EYE IRRITATION. MAY CAUSE CHEMICAL CONJUNCTIVITIS AND CORNEAL DAMAGE.

SKIN: CAUSES SKIN IRRITATION. MAY CAUSE SKIN SENSITIZATION, AN ALLERGIC REACTION, WHICH BECOMES EVIDENT UPON RE-EXPOSURE TO THIS MATERIAL. MAY CAUSE CYANOSIS OF THE EXTREMITIES.

INHALATION: INHALATION OF HIGH CONCENTRATIONS MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS CHARACTERIZED BY NAUSEA, HEADACHE, DIZZINESS, UNCONSCIOUSNESS AND COMA. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ASTHMATIC ATTACKS DUE TO ALLERGIC SENSITIZATION OF THE RESPIRATORY TRACT. ASPIRATION MAY LEAD TO PULMONARY EDEMA. VAPORS MAY CAUSE DIZZINESS OR SUFFOCATION. MAY CAUSE BURNING SENSATION IN THE CHEST.

INGESTION: MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. CAUSES GASTROINTESTINAL IRRITATION WITH NAUSEA, VOMITING AND DIARRHEA. MAY CAUSE LIVER AND KIDNEY DAMAGE. MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION, CHARACTERIZED BY EXCITEMENT, FOLLOWED BY HEADACHE, DIZZINESS, DROWSINESS, AND NAUSEA. ADVANCED STAGES MAY CAUSE COLLAPSE, UNCONSCIOUSNESS, COMA AND POSSIBLE DEATH DUE TO RESPIRATORY FAILURE. MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION.

CHRONIC EFFECTS OF EXPOSURE: REPEATED EXPOSURE MAY CAUSE SKIN DISCOLORATION AND THICKENING AND NAIL DECAY. REPEATED INHALATION IS ASSOCIATED WITH NASAL AND NASOPHARYNGEAL CANCER.

TOXICITY DATA:

CARCINOGENICITY:

CAS# 50-00-0:

ACGIH: A2 - SUSPECTED HUMAN CARCINOGEN

CALIFORNIA: CARCINOGEN; INITIAL DATE 1/1/88

NIOSH: OCCUPATIONAL CARCINOGEN

NTP: SUSPECT CARCINOGEN

OSHA: POSSIBLE SELECT CARCINOGEN

4. HEALTH HAZARD DATA (CONT):

RTECS#:

CAS # 50-00-0: LP8925000

LD50/LC50:

CAS# 50-00-0:

- DRAIZE TEST, RABBIT, EYE: 750 UG/24H SEVERE;
- DRAIZE TEST, RABBIT, EYE: 750 UG SEVERE;
- DRAIZE TEST, RABBIT, EYE: 10 MG SEVERE;
- DRAIZE TEST, RABBIT, SKIN: 2 MG/24H SEVERE;
- DRAIZE TEST, RABBIT, SKIN: 50 MG/24H MODERATE;
- INHALATION, MOUSE: LC50 = 454 GM/M3/4H;
- INHALATION, RAT: LC50 = 203 MG/M3;
- ORAL, MOUSE: LD50 = 42 MG/KG;
- ORAL, RAT: LD50 = 100 MG/KG;
- SKIN, RABBIT: LD50 = 270 UL/KG

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NIF

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER EYELIDS. GET MEDICAL AID IMMEDIATELY. DO NOT ALLOW VICTIM TO RUB OR KEEP EYES CLOSED.

SKIN CONTACT: IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

INHALATION: GET MEDICAL AID IMMEDIATELY. REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY.

INGESTION: DO NOT INDUCE VOMITING. IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL AID IMMEDIATELY.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): 50°C (122°F)

FLAMMABLE LIMITS: N/A LEL 7% UEL 73%

EXTINGUISHING MEDIA: FOR SMALL FIRES, USE DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR ALCOHOL-RESISTANT FOAM. FOR LARGE FIRES, USE WATER SPRAY, FOG, OR ALCOHOL-RESISTANT FOAM. USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS. WATER MAY BE INEFFECTIVE. DO NOT USE STRAIGHT STREAMS OF WATER.

5. FIRE AND EXPLOSION HAZARD DATA (CONT):

SPECIAL FIRE FIGHTING PROCEDURES: NA

UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS MAY FORM AN EXPLOSIVE MIXTURE WITH AIR. VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK. WILL BURN IF INVOLVED IN A FIRE. USE WATER SPRAY TO KEEP FIRE-EXPOSED CONTAINERS COOL. CONTAINERS MAY EXPLODE IN THE HEAT OF A FIRE. FLAMMABLE LIQUID AND VAPOR.

6. REACTIVITY DATA:

STABILITY: STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

UNSTABLE: STABLE: X

INCOMPATIBILITY: STRONG OXIDIZING AGENTS

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: CARBON MONOXIDE, OXIDES OF PHOSPHORUS, IRRITATING AND TOXIC FUMES AND GASES, CARBON DIOXIDE, TOXIC FUMES OF SODIUM OXIDE.

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

ABSORB SPILL WITH INERT MATERIAL (E.G. VERMICULITE, SAND OR EARTH), THEN PLACE IN A SUITABLE CONTAINER. AVOID RUNOFF INTO STORM SEWERS AND DITCHES WHICH LEAD TO WATERWAYS. CLEAN UP SPILLS IMMEDIATELY, OBSERVING PRECAUTIONS IN THE PROTECTIVE EQUIPMENT SECTION. REMOVE ALL SOURCES OF IGNITION. USE A SPARK-PROOF TOOL. PROVIDE VENTILATION. A VAPOR SUPPRESSING FOAM MAY BE USED TO REDUCE VAPORS.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

STORE AWAY FROM INCOMPATIBLE MATERIALS, IGNITION SOURCES, EXCESS HEAT, OXIDIZERS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE):

VENTILATION: MECHANICAL: X OTHER:

LOCAL EXHAUST: PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET THE PUBLISHED EXPOSURE LIMITS. VENTILATION EQUIPMENT MUST BE EXPLOSION PROOF.

8. SPECIAL PROTECTION INFORMATION (CONT):

PROTECTIVE GLOVES: X

EYE PROTECTION: X

OTHER PROTECTIVE EQUIPMENT: NA

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS: NA

10. OTHER INFORMATION:

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MATERIAL SAFETY DATA SHEET

HELENA LABORATORIES
1530 Lindbergh Dr./P.O. Box 752
Beaumont, TX 77704-0752
USA Toll Free 800-231-5663

DATE PREPARED: 8/23/2002
REVISION: 3

1. IDENTIFICATION:

NAME: SILICOTUNGSTIC ACID

CAS #: 12027-38-2

SYNONYMS: TUNGSTOSILICIC ACID * SILICOWOLFRAMIC ACID *

MOLECULAR FORMULA: H4-040-SI-W12

MOLECULAR WEIGHT: 2878.0

2. HAZARDOUS INGREDIENTS:

Table with 4 columns: CHEMICAL NAME/COMMON NAME, CAS #, %, EXPOSURE LIMITS (OSHA PEL, ACGIH TLV). Row 1: SILICOTUNGSTIC ACID, 12027-38-2, 100, N/A, N/A.

3. PHYSICAL DATA:

BOILING POINT: N/A SPECIFIC GRAVITY (H2O = 1): 4.5

VAPOR PRESSURE (MM HG.): N/A MELTING POINT: 77°F (25°C)

VAPOR DENSITY (AIR = 1): N/A SOLUBILITY IN WATER: SOLUBLE

APPEARANCE AND ODOR: WHITE TO YELLOW DELIQUESCENT CRYSTALS.

NA = Not Applicable
NL = Not Listed

NE = Not Established
NIF = No Information Found

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? X SKIN? X INGESTION? X

CARCINOGENICITY: NTP? NO IARC? NO

ACUTE EFFECT OF OVEREXPOSURE:

EYES: DUST MAY CAUSE MECHANICAL IRRITATION.

SKIN: DUST MAY CAUSE MECHANICAL IRRITATION.

INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION. THE TOXICOLOGICAL PROPERTIES OF THIS SUBSTANCE HAVE NOT BEEN FULLY INVESTIGATED.

INGESTION: LOW HAZARD FOR USUAL INDUSTRIAL HANDLING. THE TOXICOLOGICAL PROPERTIES OF THIS SUBSTANCE HAVE NOT BEEN FULLY INVESTIGATED.

CHRONIC EFFECTS OF EXPOSURE: N/A

TOXICITY DATA: N/A

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NIF

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER EYELIDS. GET MEDICAL AID.

SKIN CONTACT: FLUSH SKIN WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS.

INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID IF COUGH OR OTHER SYMPTOMS APPEAR.

INGESTION: IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. GET MEDICAL AID.



5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): NON-COMBUSTIBLE

FLAMMABLE LIMITS: LEL N/A UEL N/A

EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSION HAZARDS: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

6. REACTIVITY DATA:

STABILITY: UNSTABLE: STABLE: X

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG ACIDS

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: SILICON OXIDE

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: SWEEP UP OR ABSORB MATERIAL, THEN PLACE INTO A SUITABLE CLEAN, DRY, CLOSED CONTAINER FOR DISPOSAL. AVOID GENERATING DUSTY CONDITIONS.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE): NIOSH/MSHA-APPROVED RESPIRATOR

VENTILATION: LOCAL EXHAUST: X MECHANICAL: OTHER: GENERAL DILUTION

PROTECTIVE GLOVES: CHEMICAL RESISTANT GLOVES

EYE PROTECTION: SAFETY GLASSES OR GOGGLES

OTHER PROTECTIVE EQUIPMENT: EMERGENCY EYE WASH.

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: NIF

OTHER PRECAUTIONS: NIF

10. OTHER INFORMATION:

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MATERIAL SAFETY DATA SHEET

HELENA LABORATORIES
1530 Lindbergh Dr./P.O. Box 752
Beaumont, TX 77704-0752
USA Toll Free 800-231-5663

DATE PREPARED: 11/29/2005
REVISION: 3

1. IDENTIFICATION:

NAME: AMMONIUM NITRATE, A.C.S. REAGENT

CAS #: 6484-52-2

SYNONYMS: AMMONIUM NITRATE * AMMONIUM SALTPETER * HERCO PRILLS *
NITRIC ACID, AMMONIUM SALT * VARIOFORM I *

2. HAZARDOUS INGREDIENTS:

Table with 4 columns: CHEMICAL NAME/COMMON NAME, CAS #, %, EXPOSURE LIMITS (OSHA PEL, ACGIH TLV). Row 1: AMMONIUM NITRATE, A.C.S. REAGENT, 100, N/A, N/A.

3. PHYSICAL DATA:

BOILING POINT: N/A SPECIFIC GRAVITY (H2O = 1): 1.725
VAPOR PRESSURE (MM HG.): NA MELTING POINT: 169°C
VAPOR DENSITY (AIR = 1): NA pH: 4.5-6.0
SOLUBILITY IN WATER: YES APPEARANCE AND ODOR: WHITE
CYRSTALS, GRANULES

NA = Not Applicable NE = Not Established
NL = Not Listed NIF = No Information Found

4. HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY:

INHALATION? X SKIN? X INGESTION? X

CARCINOGENICITY: NTP? NO IARC? NO

ACUTE EFFECT OF OVEREXPOSURE:

EYES: CAUSES EYE IRRITATION.

SKIN: CAUSES SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES.

INHALATION: MATERIAL IS IRRITATING TO RESPIRATORY TRACT.

INGESTION: IRRITATING TO MEMBRANES.

CHRONIC EFFECTS OF EXPOSURE: PROLONGED EXPOSURE CAN CAUSE: GASTROINTESTINAL DISTURBANCES, BLOOD EFFECTS. TARGET ORGANS: BLOOD, CENTRAL NERVOUS SYSTEM.

TOXICITY DATA:

RTECS NO: BR9050000

AMMONIUM(I) NITRATE (1:1)

ORL-RAT LD50:2217 MG/KG GISAAA 52(8),25,87

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NIF

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING, AND SHOES. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHING BEFORE REUSE.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

INGESTION: IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.

5. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT (METHOD USED): NA

FLAMMABLE LIMITS: LEL NA UEL NA

EXTINGUISHING MEDIA: WATER SPRAY

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES. OXIDIZER. MAY EXPLODE WHEN HEATED.

UNUSUAL FIRE AND EXPLOSION HAZARDS: CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. EMITS TOXIC FUMES UNDER FIRE CONDITIONS. CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS.

6. REACTIVITY DATA:

STABILITY: UNSTABLE: X STABLE:

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG REDUCING AGENTS, STRONG ACIDS, FINELY POWDERED METALS.

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: NITROGEN OXIDES, AMMONIA

HAZARDOUS POLYMERIZATION: MAY OCCUR: WILL NOT OCCUR: X

7. SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: EVACUATE AREA. WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES. COVER WITH DRY LIME OR SODA ASH, PICK UP, KEEP IN A CLOSED CONTAINER AND HOLD FOR WASTE DISPOSAL. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

WASTE DISPOSAL METHODS: OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS.

8. SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION (SPECIFY TYPE): APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR

VENTILATION: LOCAL EXHAUST: MECHANICAL: CHEMICAL FUME HOOD

OTHER:

PROTECTIVE GLOVES: CHEMICAL-RESISTANT GLOVES

EYE PROTECTION: SAFETY GOGGLES

8. SPECIAL PROTECTION INFORMATION (CONT):

OTHER PROTECTIVE EQUIPMENT: SAFETY SHOWER AND EYE BATH, PROTECTIVE CLOTHING.

9. SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: AVOID BREATHING DUST. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE. WASH THOROUGHLY AFTER HANDLING. IRRITANT. KEEP TIGHTLY CLOSED. KEEP AWAY FROM COMBUSTIBLE MATERIALS, HEAT, SPARKS, AND OPEN FLAME. STORE IN A COOL DRY PLACE.

OTHER PRECAUTIONS:

10. OTHER INFORMATION:

AMMONIUM NITRATE DECOMPOSES AT ABOUT 210°C. THE PRESENCE OF IMPURITIES MARKEDLY LOWERS THE DECOMPOSITION TEMPERATURE, E.G. CHLORIDE SALTS, METAL OXIDES. THE FOLLOWING POWDERED METALS REACT VIOLENTLY OR EXPLOSIVELY WITH FUSED AMMONIUM NITRATE BELOW 200°C: ALUMINUM, ANTIMONY, BISMUTH, CADMIUM, CHROMIUM, COBALT, COPPER, IRON, LEAD, MAGNESIUM, MANGANESE, POTASSIUM, SODIUM, NICKEL, TIN, ZINC, TITANIUM, AS WELL AS BRASS AND STAINLESS STEEL. IGNITES OR REACTS ON CONTACT WITH: PHOSPHORUS, UREA, SULFUR, POTASSIUM NITRATE, SAWDUST, SUGAR, TRINITROANISOLE, CHARCOAL, CYANO Guanidine, POTASSIUM PERMANGANATE, ACETIC ACID, ACETIC ANHYDRIDE. HOT AQUEOUS SOLUTIONS OF AMMONIUM NITRATE OF ABOVE 50% CONCENTRATION MAY DECOMPOSE EXPLOSIVELY UNDER ADIABATIC CONDITIONS AND CONFINEMENT.

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