

MATERIAL SAFETY DATA SHEET

Date revised: February 2010

Product Name: Urinary Collagen IV EIA

Manufacturer: DAIICHI FINE CHEMICAL CO., LTD.
530 Chokeiji
Takaoka, Toyama 933-8511
Japan
Phone: +81-766-21-3456

- Components:
1. Antibody coated Microassay plate: 12x8 well strips coated with IgG directed against human collagen IV.
 2. Collagen IV Calibrators: Purified collagen IV in phosphate buffer (pH 6.0) with bovine serum albumin. Contain 30 mg/L Proclin 300 as preservative.
 3. Assay Buffer: Phosphate buffer (pH 7.0) containing bovine serum albumin and horse serum (10mL). Contains 30 mg/L Proclin 300 as preservative.
 4. Conjugate: Anti-collagen IV mouse Fab' conjugated to horseradish peroxidase (20 mL). Contains 30 mg/L Proclin 300 as preservative.
 5. Wash Concentrate: 10x Concentrated Phosphate buffer with Tween 20 (PBT), (2 bottles of 50 mL). Contain 30 mg/L Proclin 300 as preservative.
 6. Substrate contains 3,3',5,5'-tetramethylbenzidine, N,N'-dimethylformamide and hydrogen peroxide in citric acid buffer.
 7. Stop Solution contains 1mol/L sulfuric acid

MSDS for Individual Chemical Components

Tween 20

SECTION 1. ----- CHEMICAL IDENTIFICATION -----

NAME: TWEEN(R) 20 250-450 MPA.S

SECTION 2. ----- COMPOSITION/INFORMATION ON INGREDIENTS -----

CAS #: 9005-64-5

SYNONYMS

ARMOTAN PML-20, CAPMUL, DXEWMULSE POE-SML, EMSORB 6915, GLYCOSPERSE L-20, GLYCOSPERSE L-20X,

HODAG PSML-20, LIPOSORB L-20, POE 20 SORBITAN MONOLAURATE, POLYOXYETHYLENE (20) SORBITAN MONOLAURATE, PROTASORB L-20, PSML, SORBIMACROGOL LAURATE 300, SORBITAN, MONODODECANOTE, POLY(OXY-1,2-ETHANEDIYL) DERIVATIVES, TWEEN 20,

SECTION 3. ----- HAZARDS IDENTIFICATION -----

DATA NOT AVAILABLE

SECTION 4. ----- FIRST-AID MEASURES -----

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

IF INHALED, REMOVE TO FRESH AIR. IF BREATHING BECOMES DIFFICULT, CALL A PHYSICIAN.

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.

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

ASSURE ADEQUATE FLUSHING BY SEPARATING THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.

SECTION 5. ----- FIRE FIGHTING MEASURES -----

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

SPECIAL FIREFIGHTING PROCEDURES:

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

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

SECTION 6. ----- ACCIDENTAL RELEASE MEASURES -----

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. ----- HANDLING AND STORAGE -----

REFER TO SECTION 8.

SECTION 8. ----- EXPOSURE CONTROLS/PERSONAL PROTECTION -----

SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
WASH THOROUGHLY AFTER HANDLING.
AVOID INHALATION.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
NIOSH/MSHA-APPROVED RESPIRATOR.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
CHEMICAL SAFETY GOGGLES.
KEEP TIGHTLY CLOSED.
STORE AT 2-8°C (35.6-46.4°F).

SECTION 9. ----- PHYSICAL AND CHEMICAL PROPERTIES -----

APPEARANCE AND ODOR: LIQUID.

PHYSICAL PROPERTIES

BOILING POINT: 100 C

FLASHPOINT: 300F 148.88C

VAPOR PRESSURE: < 1.0 MMHG

SOLUBILITY: WATER -Z1076

SPECIFIC GRAVITY: 0.985

VISCOSITY: 250 - 450 PAS

PH: 7

SWISS POISON CLASS: FREI

SECTION 10. ----- STABILITY AND REACTIVITY -----

STABILITY: STABLE.

INCOMPATIBILITIES: STRONG OXIDIZING AGENTS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION 11. ----- TOXICOLOGICAL INFORMATION -----

ACUTE EFFECTS:

MAY CAUSE SKIN IRRITATION.

MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.

MAY CAUSE EYE IRRITATION.

MAY BE HARMFUL IF INHALED.

MATERIAL MAY BE IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.

MAY BE HARMFUL IF SWALLOWED.

TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

RTECS #: TR7400000

POLYSORBATE 20

IRRITATION DATA:

SKN-HMN 15 MG/3D-I MLD 85DKA8 -,127,1977

TOXICITY DATA:

ORL-RAT LD50:36700 UL/KG FOREAE 21,348,1956

IPR-RAT LD50:3850 MG/KG ARZNAD 26,1581,1976

IVN-RAT LD50:770 MG/KG ARZNAD 26,1581,1976

ORL-MUS LD50:>33 GM/KG ARZNAD 26,1581,1976

IPR-MUS LD50:2640 MG/KG ARZNAD 26,1581,1976

IVN-MUS LD50:1420 MG/KG RPOBAR 2,316,1970

ORL-HAM LD50:18 ML/KG FOREAE 21,348,1956

TARGET ORGAN DATA:

SPECIFIC DEVELOPMENTAL ABNORMALITIES (MUSCULOSKELETAL SYSTEM)

SPECIFIC DEVELOPMENTAL ABNORMALITIES (OTHER DEVELOPMENTAL ABNORMALITIES)

ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES

(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL.
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR
EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT B-BRIDGE INTERNATIONAL FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION:

CAUTION: SUBSTANCE NOT YET FULLY TESTED.

REVIEWS, STANDARDS, AND REGULATIONS:

OEL=MAK

EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION

FEREAC 54,7740,1989

NOES 1983: HZD X6874; NIS 22; TNF 5475; NOS 48; TNE 161625; TFE 125776

EPA TSCA SECTION 8(B) CHEMICAL INVENTORY

EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES

EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 2001

Phosphate Buffer

SECTION 1. ----- CHEMICAL IDENTIFICATION-----

NAME: PHOSPHATE BUFFER

SECTION 2. ----- COMPOSITION/INFORMATION ON INGREDIENTS -----

CAS #: NONE

HAZARDOUS INGREDIENTS:

CONTAINS SODIUM PHOSPHATE, DIBASIC CHEMICAL ABSTRACTS REGISTRY NUMBER 7558-79-4.

CONTAINS POTASSIUM PHOSPHATE, MONOBASIC, CHEMICAL ABSTRACTS REGISTRY NUMBER 7778-77-0.

RTECS DATA AND SYNONYMS SUPPLIED ARE FOR THE MOST ABUNDANT HAZARDOUS COMPONENT OF THIS PRODUCT.

SYNONYMS:

DIBASIC SODIUM PHOSPHAT, DISODIUM HYDROGEN PHOSPHATE, DISODIUM MONOHYDROGEN PHOSPHAT,
DISODIUM ORTHOPHOSPHATE, DISODIUM PHOSPHATE, DISODIUM PHOSPHORIC ACID, EXSICCATED SODIUM
PHOSPHATE, NATRIUMPHOSPHAT (GERMAN), SODA PHOSPHATE, SODIUM HYDROGEN PHOSPHATE, SODIUM
PHOSPHATE, DIBASIC, PHOSPHORIC ACID, DISODIUM SALT,

SECTION 3. ----- HAZARDS IDENTIFICATION -----

LABEL PRECAUTIONARY STATEMENTS

CAUTION:

AVOID CONTACT AND INHALATION.

HYGROSCOPIC

SECTION 4. ----- FIRST-AID MEASURES-----

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

IF INHALED, REMOVE TO FRESH AIR. IF BREATHING BECOMES DIFFICULT, CALL A PHYSICIAN.

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.

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

ASSURE ADEQUATE FLUSHING BY SEPARATING THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.

SECTION 5. ----- FIRE FIGHTING MEASURES -----

EXTINGUISHING MEDIA: NONCOMBUSTIBLE:

USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

SPECIAL FIREFIGHTING PROCEDURES

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH
SKIN AND EYES.

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

SECTION 6. ----- ACCIDENTAL RELEASE MEASURES-----

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, 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.

SECTION 7. ----- HANDLING AND STORAGE-----

REFER TO SECTION 8.

SECTION 8. ----- EXPOSURE CONTROLS/PERSONAL PROTECTION-----

SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
AVOID INHALATION.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
NIOSH/MSHA-APPROVED RESPIRATOR.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
CHEMICAL SAFETY GOGGLES.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.
WASH THOROUGHLY AFTER HANDLING.

SECTION 9. ----- PHYSICAL AND CHEMICAL PROPERTIES -----

APPEARANCE AND ODOR: SOLID.

SECTION 10. -----STABILITY AND REACTIVITY -----

STABILITY
STABLE.
INCOMPATIBILITIES
PROTECT FROM MOISTURE.
STRONG ACIDS
OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
PHOSPHOROUS OXIDES
SODIUM OXIDES
POTASSIUM OXIDES
HAZARDOUS POLYMERIZATION
WILL NOT OCCUR.

SECTION 11. ----- TOXICOLOGICAL INFORMATION -----

ACUTE EFFECTS:
MAY CAUSE SKIN IRRITATION.
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.
MAY CAUSE EYE IRRITATION.
MAY BE HARMFUL IF INHALED.
MATERIAL MAY BE IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.
MAY BE HARMFUL IF SWALLOWED.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
RTECS DATA AND SYNONYMS SUPPLIED ARE FOR THE MOST ABUNDANT HAZARDOUS
COMPONENT OF THIS PRODUCT.

RTECS #: WC4500000

SODIUM MONOHYDROGEN PHOSPHATE (2:1:1)

IRRITATION DATA:

SKN-RBT 500 MG/24H MLD	28ZPAK -,16,1972
EYE-RBT 500 MG/24H MLD	28ZPAK -,16,1972

TOXICITY DATA

ORL-RAT LD50:17 GM/KG	28ZPAK -,16,1972
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TARGET ORGAN DATA

BEHAVIORAL (TETANY)

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

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL.
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR
EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT B-BRIDGE INTERNATIONAL FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION

CAUTION: SUBSTANCE NOT YET FULLY TESTED.

RTECS DATA AND SYNONYMS SUPPLIED ARE FOR THE MOST ABUNDANT HAZARDOUS COMPONENT OF THIS PRODUCT.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK

EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION

FEREAC 54,7740,1989

NOHS 1974: HZD 83514; NIS 85; TNF 6564; NOS 60; TNE 57176

NOES 1983: HZD 83514; NIS 166; TNF 21015; NOS 135; TNE 1230592; TFE 912048

EPA TSCA SECTION 8(B) CHEMICAL INVENTORY

Bovine Serum Albumin (BSA)

SECTION 1. ----- CHEMICAL IDENTIFICATION-----

NAME: PROTEIN STANDARD (BOVINE SERUM ALBUMIN)

SECTION 2. ----- COMPOSITION/INFORMATION ON INGREDIENTS -----

CAS #: 9048-46-8

EC NO: 232-936-2

HAZARDOUS INGREDIENTS:

CONTAINS SODIUM AZIDE, CHEMICAL ABSTRACTS REGISTRY NUMBER 26628-22-8.

CONTAINS SODIUM CHLORIDE, CHEMICAL ABSTRACTS REGISTRY NUMBER 7647-14-5.

SECTION 3. ----- HAZARDS IDENTIFICATION -----

LABEL PRECAUTIONARY STATEMENTS:

HARMFUL

HARMFUL IN CONTACT WITH SKIN AND IF SWALLOWED.

CONTACT WITH ACIDS LIBERATES VERY TOXIC GAS.

SODIUM AZIDE MAY REACT WITH LEAD AND COPPER PLUMBING TO

FORM HIGHLY EXPLOSIVE METAL AZIDES.

KEEP CONTAINER TIGHTLY CLOSED.

WEAR SUITABLE PROTECTIVE CLOTHING AND GLOVES.

REFRIGERATE.

SECTION 4. ----- FIRST-AID MEASURES-----

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

IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION.

IF BREATHING IS DIFFICULT, GIVE OXYGEN.

IN CASE OF SKIN CONTACT, FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.

REMOVE CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN.

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

ASSURE ADEQUATE FLUSHING BY SEPARATING THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.

SECTION 5. ----- FIRE FIGHTING MEASURES -----

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

SPECIAL FIREFIGHTING PROCEDURES:

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS:

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.

EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. ----- ACCIDENTAL RELEASE MEASURES-----

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES.

SPILLED MATERIAL SHOULD BE CAREFULLY WIPED UP OR MOISTENED WITH WATER AND REMOVED.

VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. ----- HANDLING AND STORAGE -----

REFER TO SECTION 8.

SECTION 8. ----- EXPOSURE CONTROLS/PERSONAL PROTECTION -----

SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
WASH THOROUGHLY AFTER HANDLING.
WASH CONTAMINATED CLOTHING BEFORE REUSE.
AVOID INHALATION.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
NIOSH/MSHA-APPROVED RESPIRATOR.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
CHEMICAL SAFETY GOGGLES.
KEEP TIGHTLY CLOSED.
STORE AT 2-8°C (35.6-46.4°F).

SECTION 9. ----- PHYSICAL AND CHEMICAL PROPERTIES -----

APPEARANCE AND ODOR: LIQUID.

SECTION 10. ----- STABILITY AND REACTIVITY -----

STABILITY: STABLE.

INCOMPATIBILITIES:

DIMETHYL SULFATE IS INCOMPATIBLE WITH SODIUM AZIDE.

ACID CHLORIDES

HALOGENATED SOLVENTS

AVOID CONTACT WITH METALS.

AVOID CONTACT WITH ACID.

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.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION 11. ----- TOXICOLOGICAL INFORMATION -----

ACUTE EFFECTS:

MAY CAUSE SKIN IRRITATION.

HARMFUL IF ABSORBED THROUGH SKIN.

MAY CAUSE EYE IRRITATION.

MAY BE HARMFUL IF INHALED.

MATERIAL MAY BE IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.

HARMFUL IF SWALLOWED.

MANY AZIDES CAUSE A FALL IN BLOOD PRESSURE AND SOME INHIBIT ENZYME ACTION.

LABORATORY EXPERIMENTS IN ANIMALS HAVE SHOWN SODIUM AZIDE TO PRODUCE A PROFOUND HYPOTENSIVE EFFECT, DEMYELINATION OF MYELINATED NERVE FIBERS IN THE CENTRAL NERVOUS SYSTEM,

TESTICULAR DAMAGE, BLINDNESS, ATTACKS OF RIGIDITY, HEPATIC AND CEREBRAL EFFECTS.

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL.

OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT B-BRIDGE INTERNATIONAL FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION:

HARMFUL

R 22

HARMFUL IF SWALLOWED.

3,3',5,5'-tetramethylbenzidine

SECTION 1. ----- CHEMICAL IDENTIFICATION-----

NAME: 3,3',5,5'-TETRAMETHYLBENZIDINE SOLUTION

SECTION 2. ----- COMPOSITION/INFORMATION ON INGREDIENTS -----

CAS #: 54827-17-7

EC NO: 259-364-6

SYNONYMS: 3,3',5,5'-TETRAMETHYLBENZIDINE , 3,5,3',5'-TETRAMETHYLBENZIDINE ,

SECTION 3. ----- HAZARDS IDENTIFICATION -----

LABEL PRECAUTIONARY STATEMENTS:

IRRITANT

IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.

DO NOT BREATHE DUST.

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.

WEAR SUITABLE PROTECTIVE CLOTHING.

LIGHT AND MOISTURE SENSITIVE.

REFRIGERATE.

SECTION 4. ----- FIRST-AID MEASURES-----

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

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

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.

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

SECTION 5. ----- FIRE FIGHTING MEASURES -----

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

SPECIAL FIREFIGHTING PROCEDURES:

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

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

SECTION 6. ----- ACCIDENTAL RELEASE MEASURES-----

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, 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.

SECTION 7. ----- HANDLING AND STORAGE-----

REFER TO SECTION 8.

SECTION 8. ----- EXPOSURE CONTROLS/PERSONAL PROTECTION-----

SAFETY SHOWER AND EYE BATH.

MECHANICAL EXHAUST REQUIRED.

WASH THOROUGHLY AFTER HANDLING.

DO NOT BREATHE DUST.

AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

AVOID PROLONGED OR REPEATED EXPOSURE.

NIOSH/MSHA-APPROVED RESPIRATOR.

COMPATIBLE CHEMICAL-RESISTANT GLOVES.

CHEMICAL SAFETY GOGGLES.

KEEP TIGHTLY CLOSED.

REFRIGERATE.

SECTION 9. ----- PHYSICAL AND CHEMICAL PROPERTIES -----

APPEARANCE AND ODOR: SOLID.

PHYSICAL PROPERTIES:

BOILING POINT: 168 - 169 C

MELTING POINT: 166 - 170 C

SOLUBILITY: WATER -Z1077

SECTION 10. -----STABILITY AND REACTIVITY -----

STABILITY: STABLE.

INCOMPATIBILITIES:

PROTECT FROM LIGHT.

PROTECT FROM MOISTURE.

AVOID CONTACT WITH METALS.

STRONG ACIDS
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE,
NITROGEN OXIDES
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION 11. ----- TOXICOLOGICAL INFORMATION -----

ACUTE EFFECTS:
CAUSES SKIN IRRITATION.
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.
CAUSES EYE IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.
MAY BE HARMFUL IF INHALED.
MAY BE HARMFUL IF SWALLOWED.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

RTECS #: DV2300000

(1,1'-BIPHENYL)-4,4-DIAMINE, 3,3',5,5'-TETRAMETHYL-

TOXICITY DATA:

IPR-MUS LD50:135 MG/KG PMRSDJ 1,682,1981
ORL-QAL LD50:>316 MG/KG EESADV 6,149,1982
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR
COMPLETE INFORMATION.

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL.
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR
EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT B-BRIDGE INTERNATIONAL FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION:

IRRITANT
R 36/37/38
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.

S 22
DO NOT BREATHE DUST.

S 26

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL
ADVICE.

S 36
WEAR SUITABLE PROTECTIVE CLOTHING.

REVIEWS, STANDARDS, AND REGULATIONS:

OEL=MAK

EPA GENETOX PROGRAM 1988, POSITIVE: MAMMALIAN MICRONUCLEUS
EPA GENETOX PROGRAM 1988, NEGATIVE: HISTIDINE REVERSION-AMES TEST;
SPERM MORPHOLOGY-MOUSE
EPA GENETOX PROGRAM 1988, NEGATIVE: IN VITRO UDS-HUMAN FIBROBLAST
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 2001

Sulfuric Acid

SECTION 1. ----- CHEMICAL IDENTIFICATION -----

NAME: SULFURIC ACID 75%

SECTION 2. ----- COMPOSITION/INFORMATION ON INGREDIENTS -----

CAS #:NONE

EC NO: 231-639-5

SYNONYMS: ACIDE SULFURIQUE (FRENCH), ACIDO SOLFORICO (ITALIAN), BATTERY ACID, BOV, DIHYDROGEN SULFATE, DIPPING ACID, ELECTROLYTE ACID, MATTING ACID, OIL OF VITRIOL, SCHWEFELSAEURELOESUNGEN (GERMAN), STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID, SULFURIC ACID (ACGIH:OSHA), SULPHURIC ACID, VITRIOL BROWN OIL, ZWAVELZUROPLOSSINGEN (DUTCH),

SECTION 3. ----- HAZARDS IDENTIFICATION -----

LABEL PRECAUTIONARY STATEMENTS:

HIGHLY TOXIC (USA)

TOXIC (EU)

CAUSES SEVERE BURNS.

TOXIC BY INHALATION.

TARGET ORGAN(S):

TEETH

CARDIOVASCULAR SYSTEM

IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE

IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE

PROTECTION.

DO NOT BREATHE VAPOR.

NEVER ADD WATER TO THIS PRODUCT.

SECTION 4. ----- FIRST-AID MEASURES-----

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

DO NOT INDUCE VOMITING.

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

IN CASE OF SKIN CONTACT, FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.

REMOVE

CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN.

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

ASSURE ADEQUATE FLUSHING BY SEPARATING THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.

SECTION 5. ----- FIRE FIGHTING MEASURES -----

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

DO NOT USE WATER.

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

UNUSUAL FIRE AND EXPLOSIONS HAZARDS: STRONG DEHYDRATING AGENT WHICH MAY CAUSE IGNITION OF FINELY DIVIDED MATERIALS ON CONTACT.

EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

WATER REACTIVE MATERIAL.

SECTION 6. ----- ACCIDENTAL RELEASE MEASURES-----

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.

EVACUATE AREA.

SECTION 7. ----- HANDLING AND STORAGE-----

REFER TO SECTION 8.

SECTION 8. ----- EXPOSURE CONTROLS/PERSONAL PROTECTION-----

SAFETY SHOWER AND EYE BATH.

USE ONLY IN A CHEMICAL FUME HOOD.

WASH CONTAMINATED CLOTHING BEFORE REUSE.

DISCARD CONTAMINATED SHOES.

WASH THOROUGHLY AFTER HANDLING.

DO NOT BREATHE VAPOR.

DO NOT GET IN EYES, ON SKIN, ON CLOTHING.

AVOID PROLONGED OR REPEATED EXPOSURE.

NIOSH/MSHA-APPROVED RESPIRATOR.

COMPATIBLE CHEMICAL-RESISTANT GLOVES.

CHEMICAL SAFETY GOGGLES.

FACESHIELD (8-INCH MINIMUM).

KEEP TIGHTLY CLOSED.

STORE IN A COOL DRY PLACE.
DO NOT ALLOW CONTACT WITH WATER.

SECTION 9. ----- PHYSICAL AND CHEMICAL PROPERTIES -----

APPEARANCE AND ODOR: LIQUID.

PHYSICAL PROPERTIES:

BOILING POINT: 290 C
MELTING POINT: 10.31 C
VAPOR PRESSURE: 1 MMHG @ 145.8 C
SOLUBILITY: WATER -Z1076
SPECIFIC GRAVITY: 1.8 G
VAPOR DENSITY: < 0.3 G/L
FREEZING POINT: 3 C
VISCOSITY: 21 PAS
PH: 1.2
SWISS POISON CLASS: 2

SECTION 10. -----STABILITY AND REACTIVITY -----

STABILITY: STABLE.

INCOMPATIBILITIES:

PROTECT FROM MOISTURE.

DO NOT ALLOW WATER TO ENTER CONTAINER BECAUSE OF VIOLENT REACTION.

STRONG OXIDIZING AGENTS

DO NOT ALLOW CONTACT WITH WATER.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: SULFUR OXIDES

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION 11. ----- TOXICOLOGICAL INFORMATION -----

ACUTE EFFECTS:

CAUSES BURNS.

MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.

MATERIAL IS EXTREMELY DESTRUCTIVE TO THE TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.

TOXIC IF INHALED.

MAY BE HARMFUL IF SWALLOWED.

MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES AND SKIN.

INHALATION MAY RESULT IN SPASM, INFLAMMATION AND EDEMA OF THE LARYNX AND BRONCHI, CHEMICAL PNEUMONITIS AND PULMONARY EDEMA.

SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND VOMITING.

TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT

BEEN THOROUGHLY INVESTIGATED.

CHRONIC EFFECTS:

THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS DETERMINED THAT OCCUPATIONAL EXPOSURE TO STRONG-INORGANIC-ACID MISTS CONTAINING SULFURIC ACID IS CARCINOGENIC TO HUMANS (GROUP 1).

TARGET ORGAN(S): TEETH CARDIOVASCULAR SYSTEM

RTECS #: WS5600000

SULFURIC ACID

IRRITATION DATA:

EYE-RBT 250 UG SEV AJOPAA 29,1363,1946
EYE-RBT 5 MG/30S RINSE SEV TXCYAC 23,281,1982

TOXICITY DATA:

UNR-MAN LDLO:135 MG/KG 85DCAI 2,73,1970
ORL-RAT LD50:2140 MG/KG AIHAAP 30,470,1969
IHL-RAT LC50:510 MG/M3/2H 85GMAT -,107,1982
IHL-MUS LC50:320 MG/M3/2H 85GMAT -,107,1982
IHL-GPG LC50:18 MG/M3 MELAAD 45,590,1954

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

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR
EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT B-BRIDGE INTERNATIONAL FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION:

EC INDEX NO: 016-020-00-8

TOXIC

R 35

CAUSES SEVERE BURNS.

S 26

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL
ADVICE.

S 30

NEVER ADD WATER TO THIS PRODUCT.

S 45

IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL
WHERE POSSIBLE).

REVIEWS, STANDARDS, AND REGULATIONS:

OEL=MAK

ACGIH TLV-SUSPECTED HUMAN CARCINOGEN DTLVS* TLV/BEI,1999

ACGIH TLV-STEL 3 MG/M3 DTLVS* TLV/BEI,1999

ACGIH TLV-TWA 1 MG/M3 DTLVS* TLV/BEI,1999

IARC CANCER REVIEW:HUMAN SUFFICIENT EVIDENCE IMEMDT 54,41,1992

IARC CANCER REVIEW:GROUP 1 IMEMDT 54,41,1992

EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION

FEREAC 54,7740,1989

MSHA STANDARD-AIR:TWA 1 MG/M3

DTLVS* 3,239,1971

OSHA PEL (GEN INDU):8H TWA 1 MG/M3

CFRGBR 29,1910.1000,1994

OSHA PEL (CONSTRUC):8H TWA 1 MG/M3

CFRGBR 29,1926.55,1994

OSHA PEL (SHIPYARD):8H TWA 1 MG/M3

CFRGBR 29,1915.1000,1993

OSHA PEL (FED CONT):8H TWA 1 MG/M3

CFRGBR 41,50-204.50,1994

OEL-ARAB REPUBLIC OF EGYPT: TWA 1 MG/M3, JAN1993

OEL-AUSTRALIA: TWA 1 MG/M3, JAN1993

OEL-AUSTRIA: MAK 1 MG/M3, JAN1999

OEL-BELGIUM: TWA 1 MG/M3, STEL 3 MG/M3, JAN1993

OEL-DENMARK: TWA 1 MG/M3, JAN1999

OEL-FINLAND: TWA 1 MG/M3, STEL 3 MG/M3, SKIN, JAN1999

OEL-FRANCE: VME 1 MG/M3, VLE 3 MG/M3, JAN1999

OEL-GERMANY: MAK 1 MG/M3, JAN1999

OEL-HUNGARY: STEL 1 MG/M3, JAN1993

OEL-JAPAN: OEL 1 MG/M3, JAN1999

OEL-THE NETHERLANDS: MAC-TGG 1 MG/M3, JAN1999

OEL-NORWAY: TWA 1 MG/M3, JAN1999

OEL-POLAND: MAC(TWA) 1 MG/M3, MAC(STEL) 3 MG/M3, JAN1999

OEL-RUSSIA: STEL 1 MG/M3, SKIN, JAN1993

OEL-SWEDEN: NGV 1 MG/M3, TKV 3 MG/M3, JAN1999

OEL-SWITZERLAND: MAK-W 1 MG/M3, KZG-W 2 MG/M3, JAN1999

OEL-THAILAND: TWA 1 MG/M3, JAN1993

OEL-TURKEY: TWA 1 MG/M3, JAN1993

OEL-UNITED KINGDOM: TWA 1 MG/M3, SEP2000

OEL IN ARGENTINA, BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV;

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV

NIOSH REL TO SULFURIC ACID-AIR:10H TWA 1 MG/M3

NIOSH* DHHS #92-100,1992

NOHS 1974: HZD 70870; NIS 313; TNF 54746; NOS 143; TNE 499446
NOES 1983: HZD 70870; NIS 300; TNF 54516; NOS 182; TNE 775587; TFE
173653
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
EPA TSCA SECTION 8(E) RISK NOTIFICATION, 8EHQ-0892-9247;8EHQ-0892-9248
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 2001
NIOSH ANALYTICAL METHOD, 1994: ACIDS, INORGANIC, 7903
NTP 9TH REPORT ON CARCINOGENS, 2000:KNOWN TO BE HUMAN CARCINOGEN
OSHA ANALYTICAL METHOD #ID-113

ProClin 300

Section 1 - Product and Company Information

Product Name PROCLIN 300 50ML
Product Number 48126
Brand SUPELCO
Company Sigma-Aldrich
Street Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS MO 63103 US
Technical Phone: 314 771 5765
Emergency Phone: 414 273 3850 Ext. 5996
Fax: 800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name CAS # SARA 313
PROCLIN(TM) 300 None No
Ingredient Name CAS # Percent SARA 313
GLYCOLS None >= 91 No
<= 97
MODIFIED ALKYL CARBOXYLATE None >= 1 No
3.6
5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE 26172-55-4 >= 2.1 No
<= 2.9
2-METHYL-4-ISOTHIAZOLIN-3-ONE 2682-20-4 >= 0.6 No
<= 1.1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Corrosive.
Causes burns. May cause sensitization by skin contact.
Combustible.
HMIS RATING
HEALTH: 3
FLAMMABILITY: 2
REACTIVITY: 0
NFPA RATING
HEALTH: 3
FLAMMABILITY: 2
REACTIVITY: 0
For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is
conscious. Call a physician. Do not induce vomiting..INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give

artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

Call a physician.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT

> 151 °F > 66 °C Method: closed cup

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Use extinguishing media appropriate to surrounding fire conditions.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s): Emits toxic fumes under fire conditions.

Combustible liquid.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors.

Ventilate area and wash spill site after material pickup is complete.

ENVIRONMENTAL PRECAUTION(S)

Avoid contaminating sewers and waterways with this material.

ADDITIONAL INFORMATION (E.G. REFER TO INFORMATION UNDER OTHER HEADINGS)

Decontaminate spill area with a solution of 10% sodium bisulfite in water. Rinse decontaminated solution to a chemical sewer after standing for 30 minutes.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: The maximum recommended storage temperature for this material is 55°C/131°F. The minimum recommended storage temperature for this material is 0°C/32°F. The product as supplied evolves gas (largely carbon dioxide) slowly. To prevent the buildup of pressure the product is packaged in specially vented containers. Keep this product in the original container when not in use. Container must be stored in an upright position to prevent spilling the contents through the vent. Keep tightly closed. Keep away from heat and open flame.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

Other: Faceshield (8-inch minimum).

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance Physical State: Liquid

Property Value At Temperature or Pressure

Molecular Weight N/A

pH 4.1 Concentration: 100 g/l

BP/BP Range 189 °C

MP/MP Range -40 °C

Freezing Point N/A

Vapor Pressure 0.06 mmHg

Vapor Density > 1 g/l

Saturated Vapor Conc. N/A

SG/Density 1.03 g/cm³

Bulk Density N/A

Odor Threshold N/A

Volatile% < 95 %

VOC Content N/A

Water Content N/A

Solvent Content N/A

Evaporation Rate < 1

Viscosity 58.5 Pas 25 °C

Surface Tension N/A

Partition Coefficient Log Kow: < 3

Decomposition Temp. N/A

Flash Point > 151 °F > 66 °C Method: closed cup

Explosion Limits N/A

Flammability N/A

Autoignition Temp N/A

Refractive Index N/A

Optical Rotation N/A

Miscellaneous Data N/A

Solubility Solubility in Water: Soluble.

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Oxidizing agents, Reducing agents, Amines, Mercaptans.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Nitrogen oxides, Sulfur oxides, Hydrogen chloride gas.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes burns.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes burns.

Inhalation: Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

SENSITIZATION

Skin: May cause allergic skin reaction.

SIGNS AND SYMPTOMS OF EXPOSURE

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause: Dermatitis. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Oral

rat, female

3,723 mg/kg

LD50

Oral

rat, male

3,600 mg/kg

LD50

Skin

Rabbit

> 3,600 mg/kg

LD50

Skin

Rabbit

3,500 mg/kg

LD50

IRRITATION DATA

Skin

Rabbit

18.6 %

Remarks: Severe irritation effect

Skin

Rabbit

9.3 %

Remarks: Moderate irritation effect

Skin

Rabbit

1.8 %

Remarks: No irritation effect

Eyes

Rabbit

Remarks: Severe irritation effect

Eyes

Rabbit

9.3 %

Remarks: Moderate irritation effect

Eyes

Rabbit

1.8 %

Remarks: No irritation effect

Eyes

Rabbit

Remarks: Severe irritation effect

Skin

Rabbit

Remarks: Severe irritation effect

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber.

Section 14 - Transport Information

DOT

Proper Shipping Name: Corrosive liquid, acidic, organic, n.o.s.

UN#: 3265

Class: 8

Packing Group: Packing Group II

Hazard Label: Corrosive

PIH: Not PIH

IATA

Proper Shipping Name: Corrosive liquid, acidic, organic, n.o.s.

IATA UN Number: 3265

Hazard Class: 8

Packing Group: II

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION

Symbol of Danger: C

Indication of Danger: Corrosive.

R: 34 43

Risk Statements: Causes burns. May cause sensitization by skin contact.

S: 26 36/37/39 45

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Corrosive.

Risk Statements: Causes burns. May cause sensitization by skin contact.

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Statements: Combustible.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

CANADA REGULATORY INFORMATION

WHMIS Classification: 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.

DSL: No

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

N,N-Dimethylformamide

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME :N,N-Dimethylformamide

MANUFACTURER :Wako Pure Chemical Industries,Ltd.

SUPPLIER(In JAPAN):Wako Pure Chemical Industries,Ltd.

ADDRESS :1-2,Doshomachi 3-chome,Chuo-ku,Osaka,540-8605,Japan

TELEPHONE NUMBER &EMERGENCY TELEPHONE NUMBER:(06)6203-3741

SUPPLIER(In U.S.A.):Wako Chemicals USA,Inc.

ADDRESS :1600 Bellwood Road,Richmond,VA 23237,U.S.A.

TELEPHONE NUMBER :(800)992-9256

EMERGENCY TELEPHONE NUMBER :(800)424-9300 (CHEMTREC)

SUPPLIER(In EUROPE):Wako Chemicals GmbH,Germany

ADDRESS :Nissanstrasse 2,D-41468 Neuss,GERMANY

TELEPHONE NUMBER &EMERGENCY TELEPHONE NUMBER :(02131)311-0

Section 2 - COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME :N,N-Dimethylformamide

SYNONYMS :DMF,DMFA

FORMULA :C₃H₇NO

MOLECULAR WEIGHT :73.09

CAS NUMBER :68-12-2

TSCA INVENTORY :Listed

EINECS No.:200-679-5

INDICATION OF DANGER :*SYMBOL* :T ,*R-phrases* :61-20/21-36

Section 3 - HAZARDS IDENTIFICATION

May cause harm to the unborn child.

Harmful by inhalation and in contact with skin.

Irritating to eyes.

Harmful if ingested.

Causes skin irritation.

NFPA HR=health-1,flam.-2,react.-0,HMIS HR=health-1,flam.-2,react.-0

Section 4 - FIRST AID MEASURES

GENERAL ADVICE :Wash off immediately with soap and plenty of water.In the case of respirable dust and/or fumes,use self-contained breathing apparatus and dust impervious protective suit.Use personal protective equipment.

INHALATION :Move victim to fresh air.If breathing is difficult,give oxygen.If breathing has stopped,administer artificial respiration.Maintain normal body temperature with a blanket.If irritation persists,transport to a hospital immediately.

SKIN CONTACT: Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. If irritation persists, transport to a hospital immediately.

EYE CONTACT: Remove any contact lenses at once. Flush eyes well with flooding amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. If irritation persists, transport to a hospital immediately.

INGESTION: Rinse mouth, give plenty of water to dilute the substance. Never give anything by mouth to an unconscious person. Transport to a hospital immediately.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical powder, foam, water spray

FIRE & EXPLOSION HAZARDS: Flammable liquid. Hazardous toxic and irritating fumes or smoke may be emitted.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS: Firemen should wear normal protective equipment (full bunker gear) and positive-pressure self-contained breathing apparatus.

Section 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Remove ignition sources and ventilate area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS: Prevent spills from entering sewers, watercourses or low areas.

METHODS FOR CLEAN UP: Do not touch spilled material without suitable protection (See section 8). Take up spilled material with ashes or other absorbents. After material is completely picked up, wash the spill site with soap and water and ventilate the area. Put all wastes in a plastic bag for disposal and seal it tightly. Remove, clean, or dispose of contaminated clothing.

Section 7 - HANDLING AND STORAGE

Research use only.

HANDLING: Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Handle material with suitable protection away from source of heat or ignition and use non-sparking type tools. This material is hygroscopic. Packed on inactive gas.

STORAGE: Store away from sunlight in well-ventilated dry place at room temperature (preferably cool place). Keep container tightly closed.

INCOMPATIBLE PRODUCTS: Oxidizers, reducing agents, acids, alkalis, acid chlorides, chloroformates, halogens

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES: Use exhaust ventilation to keep airborne concentrations below exposure limits. Use only with adequate ventilation.

VENTILATION: Local Exhaust; Necessary, Mechanical (General); Necessary Special; Closed system is necessary.

CONTROL PARAMETER:

OSHA Final Limits; TWA=10ppm, 30mg/m³; skin designation

ACGIH TLV(s); TWA=10ppm, 30mg/m³; skin notation

PERSONAL PROTECTION:

Respiratory protection; NIOSH/MSHA approved respirator

Hand protection; Impervious gloves

Eye protection; Safety glasses (goggles)

Skin protection; Protective clothing

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless clear liquid

ODOR: Characteristic odor

pH: Not available

BOILING POINT: 153 °C = 307.4 °F

MELTING POINT :-61 °C=-77.8 ° F
FLASH POINT :57.8 °C=136.04 ° F(TCC)
AUTOIGNITION TEMPERATURE :445 °C=833 ° F
FLAMMABILITY (solid,gas):
DECOMPOSITION TEMPERATURE :Not available
EXPLOSIVE LIMITS :Lower;2.2%,Upper;15.2%
VAPOR PRESSURE :356Pa (at 20 °C=68 ° F)
SPECIFIC GRAVITY :0.947 ~ 0.952g/ml (at 20 °C=68 ° F)
SOLUBILITY IN :
WATER ;Miscible
USUAL ORGANIC SOLVENTS ;Miscible
log Po/w :-0.87

Section 10 - STABILITY AND REACTIVITY

CONDITION TO AVOID :Sunlight,heat,open flames,high temperature,sparks,
static electrical charge,other ignition sources
INCOMPATIBILITY(MATERIAL TO AVOID):Oxidizers,reducing agents,acids,alkalis,acid
chlorides,chloroformates,halogens
HAZARDOUS DECOMPOSITION PRODUCTS :Carbon monoxide,nitrogen oxides and dimethylamine may
be formed.
HAZARDOUS POLYMERIZATION :Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA :LD50(ori, rat):2,800mg/kg(ZEKBAI 69,103,67),
LC50(ihl,mouse):9,400mg/m³/2H(TPKVAL 1,54,61)
IRRITATION DATA :Eye;rabbit;20mg open(JIHTAB 30,63,48),
Skin;human;100%/24H;Mild(BJIMAG 13,51,56)
MUTATION DATA :Cytogenetic analysis;human:lymphocyte;100nmol/L
(CHPUA4 31,548,81)
REPRODUCTIVE EFFECTS DATA :TDLo(ori,rabbit):418mg/kg(6-18Dpreg);Effects on
Fertility(ARZNAD 30,1557,80),
TCLo(ihl, rat):4mg/m³/4H(1-19Dpreg);Effects on
fertility;Effects on embryo or fetus(TPKVAL 14,32,75)
TUMORIGENIC DATA :Not available
ADDITIONAL INFORMATION :NTP ;Not listed,
IARC ;Possibly Carcinogenic to Humans(Group 2B)
OSHA ;Not listed,
ACGIH;Not Classifiable as a Human Carcinogen (A4)
EPA GENETOX PROGRAM 1986,Negative:in vitro UDS in rat
liver

Section 12 - ECOLOGICAL INFORMATION

BIODEGRADABILITY :This material is not biodegradable.
BIOACCUMULATION POTENTIAL :This material is not or low bioaccumulatable.
AQUATIC TOXICITY :Not available
OTHER INFORMATION :WGK;1

Section 13 - DISPOSAL CONSIDERATION

Burn in a chemical incinerator equipped with an afterburner and scrubber in accordance
with all applicable regulations.Any disposal practice must be in compliance with
country,local,state,and federal laws and regulations (contact country,local or state
environmental agency for specific rules).

Section 14 - TRANSPORT INFORMATION

IATA:
PROPER SHIPPING NAME ;N,N-Dimethylformamide
CLASS or DIVISION ;Flammable liquid.(Class 3)
UN or ID No.;UN2265

DOT(Department of Transportation):
PROPER SHIPPING NAME ;N,N-Dimethylformamide
HAZARD CLASS ;Flammable liquid (Class 3)
IDENTIFICATION NUMBER;UN2265

Section 15 - REGULATORY INFORMATION

US REGULATIONS :

TSCA CHIPs,CAA/111 Volat.Org.Comp.,CAA/112 1990 Amend.,NIOSH Recommend.Subst.,

CERCLA Haz.Subst.,SARA III/313 Tox.Chem.,SARA/110 Prio.List CERCLA Haz.Subst.

(ATSDR),NTP Test.Prog.,DOT Haz.Mat.,DOT Haz.Sub.and Rep.Quant.,

Mass.Subst.List,New Jers.RTK Haz.Subst.List,Penn.Haz.Subst.List,

Canad.WHMIS IDL 1%conc.,

EPA:CERCLA RQ=100lb,EPCRA TPQ=Not listed

EPCRA section 313 de minimis concentration is 0.1%.

OSHA:TQ=Not listed

SARA:Health Assessment Rank is 240.

EU REGULATIONS :

SYMBOL :T

R-phrases :61-20/21-36

May cause harm to the unborn child.

Harmful by inhalation and in contact with skin.

Irritating to eyes.

S-phrases :53-45

Avoid exposure-obtain special instructions before use.

In case of accident or if you feel unwell,seek medical advice immediately.

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Section 16 - OTHER INFORMATION

No specific notes

The above information is believed to be correct to be the best of our knowledge and information but does not purport to be all inclusive and shall be used only as a guide.

This product is intended to be used by expert persons having chemical knowledge and skill, at their own discretion and risk and Wako shall not be held liable for any damage resulting from handling or from contact with the above material.

All MSDS links listed are for general informational purposes only. We are not recommending the manufacturers above, nor were their products necessarily used in the manufacture of this product. The above chemicals are made by a number of manufacturers. Please note that the solutions used in the Biotrin Urinary Collagen IV EIA are generally very dilute.