MAT E R I A L  S A F E T Y  D A T A  S H E E T

SECTION 1. - - - - - - - - - - CHEMICAL IDENTIFICATION - - - - - - - - - -
CATALOG #: F4636
NAME: FORMIC ACID FREE ACID ACS REAGENT

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - -
CAS #: 64-18-6
MF: CH2O2
EC NO: 200-579-1
SYNONYMS
ACIDE FORMIQUE (FRENCH) * ACIDO FORMICO (ITALIAN) * AMEISENSAEURE (GERMAN) * AMINIC ACID * FORMIC ACID (ACGIH:OSHA) * FORMYLIC ACID * HYDROGEN CARBOXYLIC ACID * KVAS METANIOWY (POLISH) * KYSELINA MRAVENCI (CZECH) * METHANOIC ACID * MIERENZUUR (DUTCH) * RCRA WASTE NUMBER U123

SECTION 3. - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
COMBUSTIBLE (USA)
FLAMMABLE (EU)
CORROSIVE
CAUSES SEVERE BURNS.
TOXIC BY INHALATION.
HARMFUL IF SWALLOWED.
POSSIBLE SENSITIZER.
TARGET ORGAN(S):
LIVER
KIDNEYS
READILY ABSORBED THROUGH SKIN.
TOXIC IF INHALED.
DO NOT BREATHE VAPOR.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).
HYGROSCOPIC
MAY DEVELOP PRESSURE.
VENT PERIODICALLY.

SECTION 4. - - - - - - - - - FIRST-AID MEASURES - - - - - - - - - -
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.
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.
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 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.

SECTION 9. - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -
PHYSICAL PROPERTIES
BOILING POINT: 100.8 C
MELTING POINT: 8.5 C
FLASHPOINT 130F
54.44C

EXPLOSION LIMITS IN AIR:
UPPER 38 %
LOWER 12 %

VAPOR PRESSURE: 44.8 MMHG @ 20 C

SOLUBILITY:
WATER -Z1079 VERY SOLUBLE IN GLYCEROL
MISCIBLE WITH A
SPECIFIC GRAVITY: 1.22
VAPOR DENSITY: 1.6 G/L
FREEZING POINT: 7 C
VISCOITY 1.607 PAS
PH: 2.2
SWISS POISON CLASS: 3

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

INCOMPATIBILITIES
PROTECT FROM MOISTURE.
STRONG OXIDIZING AGENTS
STRONG BASES
FINELY POWDERED METALS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
CARBON MONOXIDE, CARBON DIOXIDE
HAZARDOUS POLYMERIZATION
WILL NOT OCCUR.

SECTION 11. - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - -
ACUTE EFFECTS
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.
CAUSES BURNS.
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.
HIGH CONCENTRATIONS ARE EXTREMELY DESTRUCTIVE TO THE TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
TOXIC IF INHALED.
HARMFUL IF SWALLOWED.
INGESTION CAN CAUSE IMMEDIATE BURNING PAIN IN THE MOUTH, THROAT, ABDOMEN; SEVERE SWELLING OF THE LARYNX AND SKELETAL PARALYSIS AFFECTING THE ABILITY TO BREATHE, CIRCULATORY SHOCK AND CONVULSIONS.
PROLONGED OR REPEATED EXPOSURE MAY CAUSE ALLERGIC REACTIONS IN CERTAIN SENSITIVE INDIVIDUALS.
CHRONIC EFFECTS
TARGET ORGAN(S):
KIDNEYS
LIVER
CENTRAL NERVOUS SYSTEM
BLOOD
RTECS #: LQ4900000
FORMIC ACID
IRRITATION DATA
SKN-RBT 610 MG OPEN MLD UCDS** 8/5/1968
EYE-RBT 122 MG SEV UCDS** 8/5/1968
TOXICITY DATA
ORL-WMN LDL0:2440 UG/KG AJEMEN 7,286,1989
ORL-RAT LD50:1100 MG/KG GTP2AB 23(12),49,1979
IHl-RAT LC50:15 GM/M3/15M GTP2AB 23(12),49,1979
ORL-MUS LD50:700 MG/KG GTP2AB 23(12),49,1979
IHl-MUS LC50:6200 MG/M3/15M GTP2AB 23(12),49,1979
IPR-MUS LD50:940 MG/KG IGIBA5 11,507,1962
IVN-MUS LD50:145 MG/KG ZERNAL 9,332,1969
ORL-DOG LD50:4 GM/KG AMIHA5 20,517,1959
TARGET ORGAn DATA
BEHAVIORAL (SOMNOLENCE)
VASCULAR (SHOCK)
LUNGS, THORAX OR RESPIRATION (DYSPNAE)
KIDNEY, URETER, BLADDER (OTHER CHANGES IN URINE COMPOSITION)
BLOOD (OTHER HEMOLYSIS WITH OR WITHOUT ANEMIA)
NUTRITIONAL AND GROSS METABOLIC (CHANGES IN: METABOLIC ACIDOSIS)
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 SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.
SECTION 15. - - - - - - - - - REGULATORY INFORMATION - - - - - - - - -
EUROPEAN INFORMATION
EC INDEX NO: 607-001-00-0
FLAMMABLE
CORROSIVE
R 35
CAUSES SEVERE BURNS.
S 26
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).

REVIEWS, STANDARDS, AND REGULATIONS

OEL-MAK
ACGIH TLV-STEI 10 PPM
ACGIH TLV-TWA 5 PPM
MSHA STANDARD-AIR:TWA 5 PPM (9 MG/M3)
DTLVS* 3,119,1971
OSHA PEL (GEN INDU):8H TWA 5 PPM (9 MG/M3)
CFRGR 29,1910.1000,1994
OSHA PEL (CONSTRUCT):8H TWA 5 PPM (9 MG/M3)
CFRGR 29,1926.55,1994
OSHA PEL (SHIPYARD):8H TWA 5 PPM (9 MG/M3)
CFRGR 29,1915.1000,1993
OSHA PEL (FED CONT):8H TWA 5 PPM (9 MG/M3)
CFRGR 41,50-204.50,1994
OEL-ARAB REPUBLIC OF EGYPT: TWA 5 PPM (9 MG/M3), JAN1993
OEL-AUSTRALIA: TWA 5 PPM (9 MG/M3), JAN1993
OEL-AUSTRIA: MAK 5 PPM (9 MG/M3), JAN1999
OEL-BELGIUM: TWA 5 PPM (9.4 MG/M3), JAN1993
OEL-DENMARK: TWA 5 PPM (9 MG/M3), JAN1999
OEL-FRANCE: VLE 5 PPM (9 MG/M3), JAN1999
OEL-GERMANY: MAK 5 PPM (9 MG/M3), JAN1999
OEL-HUNGARY: TWA 5 MG/M3, STEL 8 MG/M3, JAN1993
OEL-JAPAN: OEL 5 PPM (9.4 MG/M3), JAN1999
OEL-THE NETHERLANDS: MAC-TGG 5 PPM (9 MG/M3), JAN1999
OEL-NORWAY: TWA 5 PPM (9 MG/M3), JAN1999
OEL-THE PHILIPPINES: TWA 5 PPM (9 MG/M3), JAN1993
OEL-POLAND: MAC(TWA) 5 MG/M3, MAC(STEL) 15 MG/M3, JAN1999
OEL-RUSSIA: TWA 5 PPM, STEL 1 MG/M3, SKIN, JAN1993
OEL-SWEDEN: TWA 3 PPM (5 MG/M3), STEL 15 PPM (45 MG/M3), SKIN, JAN1999
OEL-SWITZERLAND: MAK-W 5 PPM (9 MG/M3), STEL 10 PPM (18 MG/M3), JAN1999
OEL-UNITED KINGDOM: TWA 5 PPM (9.6 MG/M3), SEP2000
OEL IN ARGENTINA, BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV;
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NICH REL TO FORMIC ACID-AIR:10H TWA 5 PPM
NIOH* DHHS #92-100,1992
NOHS 1974: HZD 33720; NIS 59; TNE 3537; NOS 48; TNE 34087
NOES 1983: HZD 33720; NIS 95; TNE 6368; NOS 77; TNE 158933; TFE 37338
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 2001
NIOSH ANALYTICAL METHOD, 1994: FORMIC ACID, 2011
NTP TOXICITY STUDIES, RPT# TOX-19, OCTOBER 2000
OSHA ANALYTICAL METHOD #ID-112

U.S. INFORMATION

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

SECTION 16. OTHER INFORMATION—
THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA, ALDRICH, FLUKA 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.

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