MATERIAL SAFETY DATA SHEET

SECTION 1. - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - -
CATALOG #: 24125
NAME: ISO-BUTANOL, 99%

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - -
CAS #: 78-83-1
MF: C4H10O
EC NO: 201-148-0
SYNONYMS
ALCOOL ISOBUTYLIQUE (FRENCH) * FERMENTATION BUTYL ALCOHOL * 1-HYDROXYMETHYLPROPANE * ISOBUTANOL * ISOBUTYL ALCOHOL (ACGIH:OSHA) * ISOBUTYLALKOHOL (CZECH) * ISOPROPYLCARBINOL * 2-METHYL PROPAOOL * 2-METHYL-1-PROPANOL * 2-METHYLPROPAOOL-1-OL * 2-METHYLPROPYL ALCOHOL * 1-PROPANOL, 2-METHYL- * RCRA WASTE NUMBER U140 *

SECTION 3. - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
FLAMMABLE
IRRITANT
IRRITATING TO RESPIRATORY SYSTEM AND SKIN.
RISK OF SERIOUS DAMAGE TO EYES.
VAPORS MAY CAUSE DROWSINESS AND DIZZINESS.
TARGET ORGAN(S):
NERVES
LIVER
KEEP CONTAINER TIGHTLY CLOSED AND IN WELL-VENTILATED PLACE.
KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDINGSTUFFS.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE GLOVES AND EYE/FACE PROTECTION.
IF SWALLOWED, SEEK MEDICAL ADVICE IMMEDIATELY AND SHOW THIS CONTAINER OR LABEL.

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
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
WATER MAY BE EFFECTIVE FOR COOLING, BUT MAY NOT EFFECT EXTINGUISHMENT.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
FLAMMABLE LIQUID.
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK.
CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS.
SECTION 6. - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY
RUBBER GLOVES.
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.
EVACUATE AREA.
SHUT OFF ALL SOURCES OF IGNITION.
AVOID CONTAMINATING WATER SUPPLY.
SECTION 7. - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - -
REFER TO SECTION 8.
SECTION 8. - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
SAFETY SHOWER AND EYE BATH.
USE NONSPARKING TOOLS.
MECHANICAL EXHAUST REQUIRED.
WASH THOROUGHLY AFTER HANDLING.
WASH CONTAMINATED CLOTHING BEFORE REUSE.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
NIOSH/MSHA-APPROVED RESPIRATOR.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
CHEMICAL SAFETY GOGGLES.
KEEP CONTAINER CLOSED.
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.
STORE IN A COOL DRY PLACE.
SECTION 9. - - - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -
PHYSICAL PROPERTIES
BOILING POINT: 108 C
MELTING POINT: -108 C
FLASHPOINT 85F
29.44C
EXPLOSION LIMITS IN AIR:
UPPER 10.6 %
LOWER 1.7 %
VAPOR PRESSURE: 8 MMHG @ 20 C
SPECIFIC GRAVITY: 0.801
EVAPORATION RATE: 0.6
VAPOR DENSITY: 2.6 G/L
ODOR THRESHOLD: 1.6 PPM
VISCOSITY 4.00 PAS
SECTION 10. - - - - - - - - - STABILITY AND REACTIVITY - - - - - - - - -
STABILITY
STABLE.
INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
ACID CHLORIDES
ACID ANHYDRIDES
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
CARBON MONOXIDE, CARBON DIOXIDE
HAZARDOUS POLYMERIZATION
WILL NOT OCCUR.
SECTION 11. - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - -
ACUTE EFFECTS
CAUSES SKIN IRRITATION.
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.
CAUSES SEVERE EYE IRRITATION.
MAY BE HARMFUL IF INHALED.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.
MAY BE HARMFUL IF SWALLOWED.
SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING,
WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND
VOMITING.
CAN CAUSE CNS DEPRESSION.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED. CAUSES DERMATITIS.

LD
LC

CHRONIC EFFECTS
TARGET ORGAN(S): CENTRAL NERVOUS SYSTEM LIVER KIDNEYS

RTECS #: NP96250000
ISOBUTYL ALCOHOL

TOXICITY DATA

ORL-RAT LD50: 2460 MG/KG AMIHBC 10, 61, 1954
IPR-RAT LD50: 720 MG/KG EVHPAZ 61, 321, 1985
IVN-RAT LD50: 340 MG/KG EVHPAZ 61, 321, 1985
IPR-MUS LD50: 544 MG/KG RCOCB8 26, 75, 1979
IVN-MUS LD50: 417 MG/KG EVHPAZ 61, 321, 1985
SKN-RBT LD50: 3400 MG/KG NPIRI* 1, 11, 1974
IPR-RBT LD50: 323 MG/KG EVHPAZ 61, 321, 1985
IPR-GPG LD50: 1201 MG/KG EVHPAZ 61, 321, 1985
IPR-HAM LD50: 1401 MG/KG EVHPAZ 61, 321, 1985

TARGET ORGAN DATA
LIVER (OTHER CHANGES)
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.
BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY FLAMMABLE.
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: 603-004-00-6
FLAMMABLE
IRRITANT
R 10
FLAMMABLE.
R 37/38
IRRITATING TO RESPIRATORY SYSTEM AND SKIN.
R 41
RISK OF SERIOUS DAMAGE TO EYES.
R 67
VAPORS MAY CAUSE DROWSINESS AND DIZZINESS.
S 7/9
KEEP CONTAINER TIGHTLY CLOSED AND IN WELL-VENTILATED PLACE.
S 13
KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDINGSTUFFS.
S 26
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
S 37/39
WEAR SUITABLE GLOVES AND EYE/FACE PROTECTION.
S 46
IF SWALLOWED, SEEK MEDICAL ADVICE IMMEDIATELY AND SHOW THIS CONTAINER OR LABEL.

REVIEWS, STANDARDS, AND REGULATIONS
OEL=MAK
ACGIH TLV-TWA 50 PPM
MSHA STANDARD-AIR:TWA 100 PPM (300 MG/M3)
DTLVS* 3,140,1971
OSHA PEL (GEN INDU):8H TWA 100 PPM (300 MG/M3)
CFRGRB 29,1910.1000,1994
OSHA PEL (CONSTRUC):8H TWA 100 PPM (300 MG/M3)
CFRGRB 29,1926.55,1994
OSHA PEL (SHIPYARD):8H TWA 100 PPM (300 MG/M3)
CFRGRB 29,1915.1000,1993
OSHA PEL (FED CONT):8H TWA 100 PPM (300 MG/M3)
CFRGRB 41,50-204.50,1994
OEL-AUSTRALIA: TWA 50 PPM (150 MG/M3), JAN1993
OEL-AUSTRIA: MAK 50 PPM (150 MG/M3), JAN1999
OEL-BELGIUM: TWA 50 PPM (152 MG/M3), JAN1993
OEL-DENMARK: TWA 50 PPM (150 MG/M3), SKIN, JAN1999
OEL-FRANCE: VME 50 PPM (150 MG/M3), JAN1999
OEL-GERMANY: MAK 100 PPM (300 MG/M3), JAN1999
OEL-JAPAN: OEL 50 PPM (150 MG/M3), JAN1999
OEL-THE NETHERLANDS: MAC-TGG 50 PPM (150 MG/M3), JAN1999
OEL-THE PHILIPPINES: TWA 100 PPM (300 MG/M3), JAN1993
OEL-POLAND: MAC(TWA) 100 MG/M3, MAC(STEL) 200 MG/M3, JAN1999
OEL-RUSSIA: TWA 50 PPM, STEL 10 MG/M3, SKIN, JAN1993
OEL-SWITZERLAND: MAK-W 50 PPM (150 MG/M3), KZG-W 100 PPM (300 MG/M3), JAN1999
OEL-UNITED KINGDOM: TWA 50 PPM (154 MG/M3), STEL 75 PPM, SEP2000
OEL IN ARGENTINA, BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV;
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NIOSH REL TO ISOBUTYL ALCOHOL-AIR:10H TWA 50 PPM
NIOSH* DHHS #92-100,1992
NOHS 1974: HZD 40430; NIS 181; TNF 16985; NOS 98; TNE 107310
NOES 1983: HZD 40430; NIS 155; TNF 15449; NOS 99; TNE 256975; TFE 49376
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: ALCOHOLS II, 1401

SECTION 16. — — — — — — — — — OTHER INFORMATION— — — — — — — — —
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