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M A T 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 #: D4254
NAME: N,N-DIMETHYLFORMAMIDE

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

CAS #: 68-12-2
MF: C3H7NO
EC NO: 200-679-5

SYNONYMS

DIMETHYLAMID KYSELINY MRAVENCÍ (CZECH) * DIMETHYLFORMAMID (GERMAN) *
DIMETHYL FORMAMIDE * N,N-DIMETHYL FORMAMIDE * DIMETHYLFORMAMIDE
(ACGIH:OSHA) * N,N-DIMETHYLMETHANAMIDE * DIMETILFORMAMIDE (ITALIAN) *
DIMETHYLFORMAMIDU (CZECH) * DMF * DMFA * DWUMETYLOFORMAMID (POLISH) *
N-FORMYLDIMETHYLAMINE * NCI-C60913 * NSC 5356 * U-4224 *

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

LABEL PRECAUTIONARY STATEMENTS

TOXIC
MAY CAUSE HARM TO THE UNBORN CHILD.
HARMFUL BY INHALATION AND IN CONTACT WITH SKIN.
IRRITATING TO EYES AND SKIN.
COMBUSTIBLE.
READILY ABSORBED THROUGH SKIN.
TARGET ORGAN(S):
LIVER
KIDNEYS
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.

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

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED
CLOTHING AND SHOES.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.
DISCARD CONTAMINATED SHOES.

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

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

EVACUATE AREA.
WEAR SELF-CONTAINED BREATHING APPARATUS, 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.

ADDITIONAL INFORMATION

DIMETHYLFORMAMIDE (DMF) MIXED WITH TRIETHYLALUMINUM IS EXPLOSIVE WHEN HEATED. IT REACTS VIOLENTLY WITH CARBON TETRACHLORIDE OR 1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (BENZENE HEXACHLORIDE) ABOVE 65 C AND WITH SUCH OXIDIZING AGENTS AS CHROMIC ANHYDRIDE, MAGNESIUM NITRATE, POTASSIUM PERMANGANATE, BROMINE AND NITRIC ACID.

RUNAWAY REACTIONS WITH SODIUM HYDRIDE AND BOROHYDRIDE HAVE BEEN REPORTED.

CAN REACT VIGOROUSLY IN THE PRESENCE OF IRON WITH HALOGENATED HYDROCARBONS AT MODERATE TEMPERATURES.

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

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.

SAFETY SHOWER AND EYE BATH.

IMPERVIOUS PROTECTIVE CLOTHING.

FACESHIELD (8-INCH MINIMUM).

USE ONLY IN A CHEMICAL FUME HOOD.

DO NOT BREATHE VAPOR.

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

AVOID PROLONGED OR REPEATED EXPOSURE.

WASH THOROUGHLY AFTER HANDLING.

KEEP TIGHTLY CLOSED.

KEEP AWAY FROM HEAT AND OPEN FLAME.

STORE IN A COOL DRY PLACE.

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

APPEARANCE AND ODOR

LIQUID.

PHYSICAL PROPERTIES

BOILING POINT: 153 C
MELTING POINT: -61 C
FLASHPOINT 136F
57.77C

EXPLOSION LIMITS IN AIR:

UPPER 15.2%
LOWER 2.2%

AUTOIGNITION TEMPERATURE: 833 F 444C

VAPOR PRESSURE: 2.7MM 20 C

SPECIFIC GRAVITY: 0.944

VAPOR DENSITY: 2.5

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

STABILITY

STABLE.

INCOMPATIBILITIES

ACID CHLORIDES
OXIDIZING AGENTS
CHLOROFORMATES
REDUCING AGENTS
HALOGENS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, AND NITROGEN OXIDES.

HAZARDOUS POLYMERIZATION

WILL NOT OCCUR.

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

ACUTE EFFECTS

HARMFUL IF INHALED.

HARMFUL IF ABSORBED THROUGH SKIN.

MAY BE HARMFUL IF SWALLOWED.

CAUSES EYE AND SKIN IRRITATION.

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

EXPOSURE CAN CAUSE:

STOMACH PAINS, VOMITING, DIARRHEA.

NAUSEA, DIZZINESS AND HEADACHE

READILY ABSORBED THROUGH SKIN.

CHRONIC EFFECTS

THIS PRODUCT IS OR CONTAINS A COMPONENT THAT HAS BEEN REPORTED TO BE
POSSIBLY CARCINOGENIC BASED ON ITS IARC, ACGIH, NTP OR EPA
CLASSIFICATION.

MAY CAUSE CONGENITAL MALFORMATION IN THE FETUS.

TARGET ORGAN(S):

LIVER

KIDNEYS

CENTRAL NERVOUS SYSTEM

CARDIOVASCULAR SYSTEM

BLOOD

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

ADDITIONAL INFORMATION

WARNING: INTOLERANCE FOR ALCOHOL CAN OCCUR UP TO 4 DAYS AFTER
DIMETHYLFORMAMIDE EXPOSURE. N,N-DIMETHYLFORMAMIDE IS CONSIDERED TO BE
A POTENT LIVER TOXIN.

RTECS #: LQ2100000

FORMAMIDE, N,N-DIMETHYL-

IRRITATION DATA

SKN-HMN 100%/24H MLD

BJIMAG 13,51,1956

EYE-RBT 100 MG RINSE SEV

DCTODJ 9,147,1986

TOXICITY DATA

ORL-RAT LD50:2800 MG/KG

ZEKBAI 69,103,1967

IPR-RAT LD50:1400 MG/KG

BJIMAG 13,51,1956

SCU-RAT LD50:3800 MG/KG

ARZNAD 15,618,1965

IVN-RAT LD50:2 GM/KG

ZEKBAI 69,103,1967

UNR-RAT LD50:>3 GM/KG

ARZNAD 18,645,1968

ORL-MUS LD50:3700 MG/KG

GISAAA 23(5),31,1958

IHL-MUS LC50:9400 MG/M3/2H

TPKVAL 1,54,1961

IPR-MUS LD50:650 MG/KG

CNCRA6 30,9,1963

SCU-MUS LD50:4500 MG/KG

ARZNAD 15,618,1965

IVN-MUS LD50:2500 MG/KG

ARZNAD 15,618,1965

IMS-MUS LD50:3900 MG/KG

ARZNAD 15,618,1965

IVN-DOG LD50:470 MG/KG

ARZNAD 15,618,1965

IPR-CAT LD50:500 MG/KG

BJIMAG 13,51,1956

ORL-RBT LD50:5 GM/KG

NTIS** OTS0520699

SKN-RBT LD50:4720 MG/KG

AIHAAP 30,470,1969

IPR-RBT LD50:1 GM/KG

BJIMAG 13,51,1956

IVN-RBT LD50:1800 MG/KG

ARZNAD 15,618,1965

IVN-GPG LD50:1050 MG/KG

ARZNAD 15,618,1965

TARGET ORGAN DATA

BEHAVIORAL (SOMNOLENCE)

BEHAVIORAL (MUSCLE WEAKNESS)

LIVER (OTHER CHANGES)

KIDNEY, URETER, BLADDER (OTHER CHANGES IN URINE COMPOSITION)

ENDOCRINE (EFFECT ON MENSTRUAL CYCLE)

BLOOD (CHANGES IN CELL COUNT)

PATERNAL EFFECTS (SPERMATOGENESIS)

MATERNAL EFFECTS (OTHER EFFECTS ON FEMALE)

EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)

EFFECTS ON EMBRYO OR FETUS (EXTRA EMBRYONIC STRUCTURES)

EFFECTS ON EMBRYO OR FETUS (FETOTOXICITY)

SPECIFIC DEVELOPMENTAL ABNORMALITIES (BODY WALL)

SPECIFIC DEVELOPMENTAL ABNORMALITIES (MUSCULOSKELETAL SYSTEM)

NUTRITIONAL AND GROSS METABOLIC (WEIGHT LOSS OR DECREASED WEIGHT GAIN)

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 - - - - -

THIS COMBUSTIBLE MATERIAL MAY BE BURNED 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: 616-001-00-X

TOXIC

R 20/21

HARMFUL BY INHALATION AND IN CONTACT WITH SKIN.

R 36

IRRITATING TO EYES.

R 61

MAY CAUSE HARM TO THE UNBORN CHILD.

S 45

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

IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

S 53

AVOID EXPOSURE - OBTAIN SPECIAL INSTRUCTIONS BEFORE USE.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK

ACGIH TLV-NOT CLASSIFIABLE AS A HUMAN CARCINOGEN DTLVS* TLV/BEI,1997

ACGIH TLV-TWA 30 MG/M3 (10 PPM) (SKIN) DTLVS* TLV/BEI,1997

IARC CANCER REVIEW:HUMAN LIMITED EVIDENCE IMEMDT 47,171,1989

IARC CANCER REVIEW:ANIMAL INADEQUATE EVIDENCE IMEMDT 47,171,1989

IARC CANCER REVIEW:GROUP 2B IMEMDT 47,171,1989

MSHA STANDARD-AIR:TWA 10 PPM (30 MG/M3) (SKIN)

DTLVS* 3,90,1971

OSHA PEL (GEN INDU):8H TWA 10 PPM (30 MG/M3) (SKIN)

CFRGBR 29,1910.1000,1994

OSHA PEL (CONSTRUC):8H TWA 10 PPM (30 MG/M3) (SKIN)

CFRGBR 29,1926.55,1994

OSHA PEL (SHIPYARD):8H TWA 10 PPM (30 MG/M3) (SKIN)

CFRGBR 29,1915.1000,1993

OSHA PEL (FED CONT):8H TWA 10 PPM (30 MG/M3) (SKIN)

CFRGBR 41,50-204.50,1994

OEL-AUSTRALIA:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-BELGIUM:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-DENMARK:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-FINLAND:TWA 10 PPM (30 MG/M3);STEL 20 PPM (60 MG/M3);SKIN JAN 1993

OEL-FRANCE:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-GERMANY:TWA 20 PPM (60 MG/M3);SKIN JAN 1993

OEL-HUNGARY:TWA 10 MG/M3;STEL 20 MG/M3;SKIN JAN 1993

OEL-JAPAN:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-THE NETHERLANDS:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-THE PHILIPPINES:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-POLAND:TWA 10 MG/M3 JAN 1993

OEL-RUSSIA:TWA 10 PPM;STEL 10 MG/M3;SKIN JAN 1993

OEL-SWEDEN:TWA 10 PPM (30 MG/M3);STEL 15 PPM (45 MG/M3);SKIN JAN 1993

OEL-SWITZERLAND:TWA 10 PPM (30 MG/M3);STEL 20 PPM;SKIN JAN 1993

OEL-TURKEY:TWA 10 PPM (30 MG/M3);SKIN JAN 1993

OEL-UNITED KINGDOM:TWA 10 PPM (30 MG/M3);STEL 20 PPM;SKIN JAN 1993

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

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV

NIOSH REL TO DIMETHYLFORMAMIDE-AIR:10H TWA 10 PPM (SK)

NIOSH* DHHS #92-100,1992

NOHS 1974: HZD 26560; NIS 64; TNF 3115; NOS 71; TNE 69191

NOES 1983: HZD 26560; NIS 85; TNF 6209; NOS 93; TNE 124683; TFE 16011

EPA GENETOX PROGRAM 1988, NEGATIVE: SHE-CLONAL ASSAY; SPERM

MORPHOLOGY-MOUSE

EPA GENETOX PROGRAM 1988, NEGATIVE: IN VITRO UDS IN RAT LIVER

EPA GENETOX PROGRAM 1988, INCONCLUSIVE: MAMMALIAN MICRONUCLEUS
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, JUNE 1998
NIOSH ANALYTICAL METHOD, 1994: DIMETHYLFORMAMIDE, 2004
NTP TOXICITY STUDIES, RPT# TOX-22, OCTOBER 1997
OSHA ANALYTICAL METHOD #ID-66

U.S. INFORMATION

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

SECTION 16. - - - - - OTHER INFORMATION- - - - -

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