



SIGMA-ALDRICH

ALDRICH CHEMICAL COMPANY, INC.
P.O. BOX 355
MILWAUKEE, WISCONSIN 53201, USA

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UNIVERSITY OF WISCONSIN WHITEWATER
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DATE 09/24/99
CUST#: 523216
PO#: CC/ONSRUD/92399

M A T E R I A L S A F E T Y D A T A S H E E T PAGE 1

SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #: 27037-7
NAME: TOLUENE, 99.8%, HPLC GRADE

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #: 108-88-3
MF: C7H8
EC NO: 203-625-9

SYNONYMS

ANTISAL 1A \* BENZENE, METHYL- \* CP 25 \* METHACIDE \* METHANE, PHENYL- \*
METHYLBENZENE \* METHYLBENZOL \* NCI-C07272 \* PHENYLMETHANE \* RCRA
WASTE NUMBER U220 \* TOLUEEN (DUTCH) \* TOLUEN (CZECH) \* TOLUENE (ACGIH:
OSHA) \* TOLUENO (SPANISH) \* TOLUOL \* TOLUOLO (ITALIAN) \* TOLU-SOL \*

SECTION 3. HAZARDS IDENTIFICATION

LABEL PRECAUTIONARY STATEMENTS

FLAMMABLE (USA)
HIGHLY FLAMMABLE (EU)
TOXIC
TOXIC BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
CALIF. PROP. 65 REPRODUCTIVE HAZARD.
CAUSES SEVERE IRRITATION.
TARGET ORGAN(S):
LIVER
KIDNEYS
BRAIN
BLADDER
KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH PLENTY OF WATER. WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

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.

SECTION 5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

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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.  
USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS  
VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND  
FLASH BACK.  
CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS.  
FLAMMABLE LIQUID.  
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

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

WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY  
RUBBER GLOVES.  
COVER WITH AN ACTIVATED CARBON ADSORBENT, TAKE UP AND PLACE IN CLOSED  
CONTAINERS. TRANSPORT OUTDOORS.  
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.  
EVACUATE AREA.  
SHUT OFF ALL SOURCES OF IGNITION.  
USE NONSPARKING TOOLS.

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

REFER TO SECTION 8.

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

USE ONLY IN A CHEMICAL FUME HOOD.  
SAFETY SHOWER AND EYE BATH.  
WASH THOROUGHLY AFTER HANDLING.  
DO NOT BREATHE VAPOR.  
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.  
AVOID PROLONGED OR REPEATED EXPOSURE.  
SELF-CONTAINED BREATHING APPARATUS SHOULD BE WORN.  
COMPATIBLE CHEMICAL-RESISTANT GLOVES.  
CHEMICAL SAFETY GOGGLES.  
KEEP TIGHTLY CLOSED.  
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.  
STORE IN A COOL DRY PLACE.  
TOXIC.  
SEVERE IRRITANT.

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

PHYSICAL PROPERTIES  
BOILING POINT: 110.6 C  
MELTING POINT: -93 C

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CATALOG #: 27037-7  
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SKN-RBT 435 MG MLD	UCDS** 7/23/1970
SKN-RBT 500 MG MOD	FCTOD7 20,563,1982
SKN-RBT 20 MG/24H MOD	85JCAE - 29,1986
EYE-RBT 870 UG MLD	UCDS** 7/23/1970
EYE-RBT 2 MG/24H SEV	85JCAE - 29,1986
EYE-RBT 100 MG/30S RINSE MLD	FCTOD7 20,573,1982

TOXICITY DATA

ORL-HMN LD50:50 MG/KG	YAKUD5 22,883,1980
ORL-RAT LD50:636 MG/KG	NRTXDN 2,567,1981
IHL-RAT LC50:49 GM/M3/4H	GTPZAB 32(10),23,1988
IPR-RAT LD50:1332 MG/KG	ENVRAL 40,411,1986
IVN-RAT LD50:1960 MG/KG	MELAAD 54,486,1963
UNR-RAT LD50:6900 MG/KG	GISAAA 45(12),64,1980
IHL-MUS LC50:400 PPM/24H	NRTXDN 2,567,1981
IPR-MUS LD50:59 MG/KG	NRTXDN 2,567,1981
SCU-MUS LD50:2250 MG/KG	NRTXDN 8,237,1987
UNR-MUS LD50:2 GM/KG	GISAAA 45(12),64,1980
SKN-RBT LD50:14100 UL/KG	AIHAAP 30,470,1969
IPR-GPG LD50:500 MG/KG	NRTXDN 2,567,1981
ORL-MAM LD50:4 GM/KG	GTPZAB 32(10),25,1988
IHL-MAM LC50:30 GM/M3	GTPZAB 32(10),25,1988

TARGET ORGAN DATA

BRAIN AND COVERINGS (RECORDINGS FROM SPECIFIC AREAS OF CNS)  
AUTONOMIC NERVOUS SYSTEM (OTHER: PARASYMPATHOMIMETIC)  
BEHAVIORAL (GENERAL ANESTHETIC)  
BEHAVIORAL (SOMNOLENCE)  
BEHAVIORAL (HALLUCINATIONS, DISTORTED PERCEPTIONS)  
BEHAVIORAL (CONVULSIONS OR EFFECT ON SEIZURE THRESHOLD)  
BEHAVIORAL (CHANGE IN MOTOR ACTIVITY)  
BEHAVIORAL (MUSCLE CONTRACTION OR SPASTICITY)  
BEHAVIORAL (ANTIPSYCHOTIC)  
BEHAVIORAL (IRRITABILITY)  
BEHAVIORAL (CHANGE IN PSYCHOPHYSIOLOGICAL TESTS)  
LUNGS, THORAX OR RESPIRATION (OTHER CHANGES)  
BLOOD (CHANGES IN BONE MARROW NOT INCLUDED IN ABOVE)  
MATERNAL EFFECTS (OTHER EFFECTS ON FEMALE)  
EFFECTS ON FERTILITY (ABORTION)  
SPECIFIC DEVELOPMENTAL ABNORMALITIES (MUSCULOSKELETAL SYSTEM)  
SPECIFIC DEVELOPMENTAL ABNORMALITIES (UROGENITAL SYSTEM)  
EFFECTS ON NEWBORN (BIOCHEMICAL AND METABOLIC)  
EFFECTS ON NEWBORN (PHYSICAL)  
EFFECTS ON NEWBORN (DELAYED EFFECTS)  
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 - - - - -

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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 ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. REGULATORY INFORMATION

EUROPEAN INFORMATION

EC INDEX NO: 601-021-00-3
HIGHLY FLAMMABLE
TOXIC
R 11
HIGHLY FLAMMABLE.
R 20
HARMFUL BY INHALATION.
S 16
KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.
S 23
DO NOT BREATHE FUMES.
S 29
DO NOT EMPTY INTO DRAINS.
S 33
TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK
ACGIH TLV-NOT CLASSIFIABLE AS A HUMAN CARCINOGEN DTLVS\* TLV/BEI,1997
ACGIH TLV-TWA 188 MG/M3 (50 PPM) (SKIN) DTLVS\* TLV/BEI,1997
IARC CANCER REVIEW:ANIMAL INADEQUATE EVIDENCE IMEMDT 47,79,1989
IARC CANCER REVIEW:HUMAN INADEQUATE EVIDENCE IMEMDT 47,79,1989
IARC CANCER REVIEW:GROUP 3 IMEMDT 47,79,1989
MSHA STANDARD-AIR:TWA 100 PPM (375 MG/M3) (SKIN)
DTLWS\* 3,29,1973
OSHA PEL (GEN INDU):8H TWA 200 PPM;CL 300;PK 500/10M
CFRGBR 29,1910.1000,1994
OSHA PEL (CONSTRUC):8H TWA 200 PPM (750 MG/M3)
CFRGBR 29,1926.55,1994
OSHA PEL (SHIPYARD):8H TWA 200 PPM (750 MG/M3)
CFRGBR 29,1915.1000,1993
OSHA PEL (FED CONT):8H TWA 200 PPM (750 MG/M3)
CFRGBR 41,50-204.50,1994
OEL-AUSTRALIA:TWA 100 PPM (375 MG/M3);STEL 150 PPM (560 MG/M3) JAN 1993
OEL-AUSTRIA: MAK 100 PPM (380 MG/M3) JAN1999
OEL-BELGIUM:TWA 100 PPM (377 MG/M3);STEL 150 PPM (565 MG/M3) JAN 1993
OEL-DENMARK: TWA 35 PPM (130 MG/M3); SKIN, JAN1999
OEL-FINLAND:TWA 100 PPM (375 MG/M3);STEL 150 PPM;SKIN JAN 1993

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OEL-FRANCE: VME 100 PPM (375 MG/M3), VLE 150 PPM (550 MG/M3), JAN1999  
OEL-JAPAN: OEL 50 PPM (188 MG/M3), JAN1999  
OEL-GERMANY:TWA 100 PPM (380 MG/M3) JAN 1993  
OEL-HUNGARY:TWA 100 MG/M3;STEL 300 MG/M3;SKIN JAN 1993  
OEL-JAPAN:TWA 100 PPM (380 MG/M3) JAN 1993  
OEL-POLAND: MAC(TWA) 100 MG/M3, MAC(STEL) 350 MG/M3, JAN1999  
OEL-THE NETHERLANDS:TWA 100 PPM (375 MG/M3);SKIN JAN 1993  
OEL-THE PHILIPPINES:TWA 100 PPM (375 MG/M3) JAN 1993  
OEL-RUSSIA:TWA 100 PPM;STEL 50 MG/M3 JAN 1993  
OEL-SWEDEN:TWA 50 PPM (200 MG/M3);STEL 100 PPM (400 MG/M3);SKIN JAN 1993  
OEL-SWITZERLAND:TWA 100 PPM (380 MG/M3);STEL 500 PPM JAN 1993  
OEL-THAILAND:TWA 200 PPM;STEL 300 PPM JAN 1993  
OEL-TURKEY:TWA 200 PPM (750 MG/M3) JAN 1993  
OEL-UNITED KINGDOM:TWA 100 PPM (375 MG/M3);STEL 150 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 TOLUENE-AIR:10H TWA 100 PPM;STEL 150 PPM  
NIOSH\* DHHS #92-100,1992  
NOHS 1974: HZD 73300; NIS 412; TNF 125516; NOS 206; TNE 1589482  
NOES 1983: HZD 73300; NIS 399; TNF 128510; NOS 232; TNE 2015881; TFE 391255  
ATSDR TOXICOLOGY PROFILE (NTIS\*\* PB/90/198904/AS)  
EPA GENETOX PROGRAM 1988, NEGATIVE: CELL TRANSFORM.-SA7/SHE; IN VITRO SCE-HUMAN  
EPA GENETOX PROGRAM 1988, NEGATIVE: SPERM MORPHOLOGY-MOUSE  
EPA GENETOX PROGRAM 1988, INCONCLUSIVE: E COLI POLA WITHOUT S9  
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY  
EPA TSCA 8(A) PRELIMINARY ASSESSMENT INFORMATION, FINAL RULE FEREAC 47,26992,82  
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES ON EPA IRIS DATABASE  
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JUNE 1999  
NIOSH ANALYTICAL METHOD, 1994: TOLUENE IN BLOOD, 8002  
NIOSH ANALYTICAL METHOD, 1994: HYDROCARBONS, BP 36-126 DEGREE C, 1500  
NIOSH ANALYTICAL METHOD, 1994: HYDROCARBONS, AROMATIC, 1501  
NIOSH ANALYTICAL METHOD, 1994: TOLUENE (PASSIVE), 4000  
NTP CARCINOGENESIS STUDIES (INHALATION);NO EVIDENCE:MOUSE,RAT  
NTPTR\* NTP-TR-371,1990

U.S. INFORMATION

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.  
THIS PRODUCT IS OR CONTAINS CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE DEVELOPMENTAL TOXICITY.  
CALIFORNIA PROPOSITION 65:

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. ALDRICH 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

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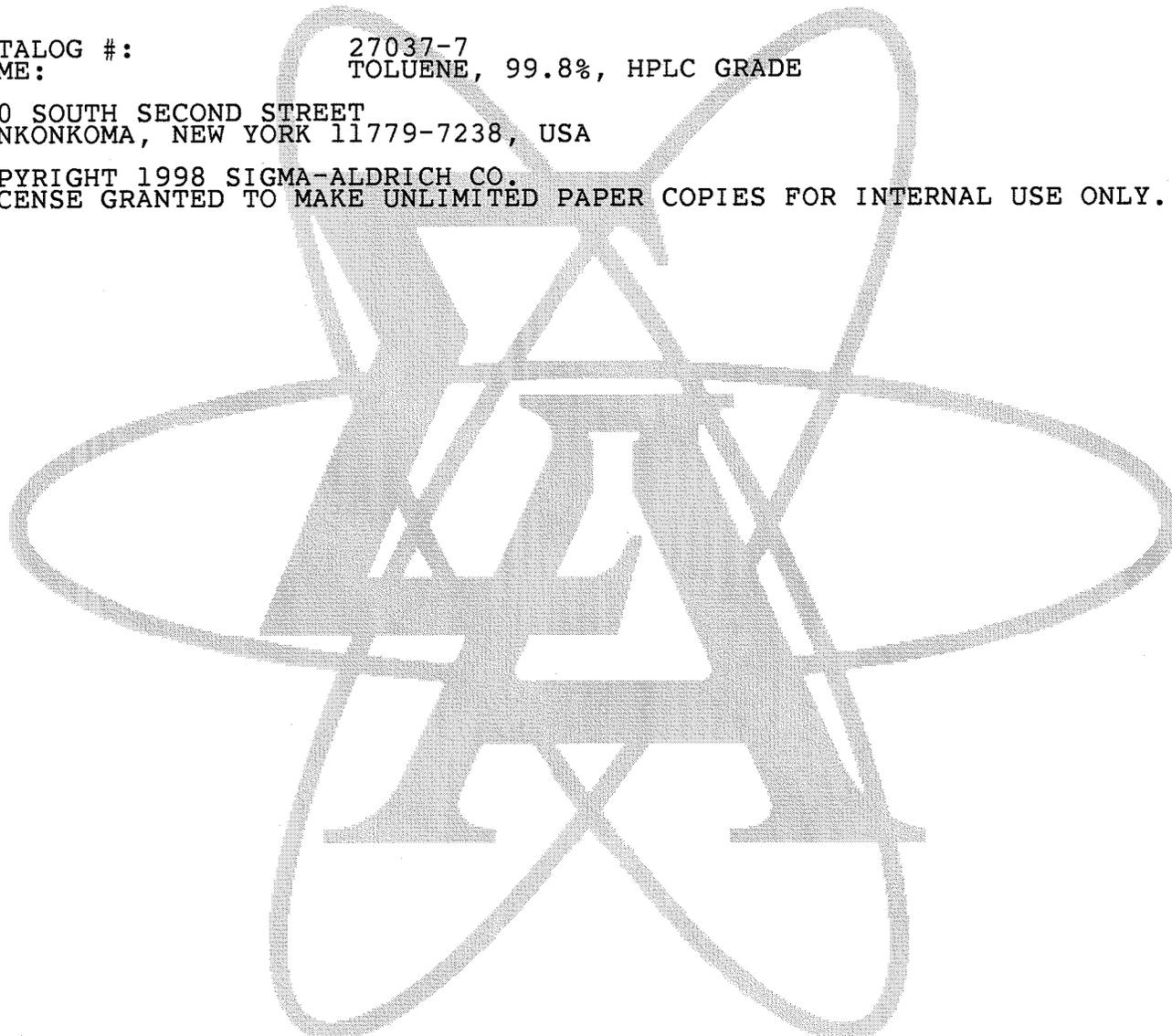
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M A T E R I A L   S A F E T Y   D A T A   S H E E T                      P A G E   7

CATALOG #: 27037-7  
NAME: TOLUENE, 99.8%, HPLC GRADE

980 SOUTH SECOND STREET  
RONKONKOMA, NEW YORK 11779-7238, USA

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