

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

PRODUCT IDENTIFICATION

PRODUCT NAME: TETRAHYDROFURAN
COMMON SYNONYMS: THF; 1,4-EPOXYBUTANE; BUTYLENE OXIDE;
CYCLOTETRAMETHYLENE
OXIDE
CHEMICAL FAMILY: ETHERS
FORMULA: C4H8O
FORMULA WT.: 72.11
CAS NO.: 109-99-9
NIOSH/RTECS NO.: LU5950000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 9449,9441,9442,9450,V530,9215,9440

CHEMTREC # (800) 424-9300 NATIONAL RESPONSE CENTER # (800) 424-8802
J.T.BAKER INC. 222 RED SCHOOL LANE PHILLIPSBURG, NJ 08865 24-HOUR
EMERGENCY TELEPHONE -- (201) 859-2151

EFFECTIVE: 01/04/94 ISSUED: 04/08/95
REVISION #05

PRECAUTIONARY LABELING

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	2	MODERATE
FLAMMABILITY	-	3	SEVERE (FLAMMABLE)
REACTIVITY	-	2	MODERATE
CONTACT	-	1	SLIGHT

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

U.S. PRECAUTIONARY LABELING

DANGER

EXTREMELY FLAMMABLE. CAUSES SEVERE IRRITATION. MAY FORM EXPLOSIVE PEROXIDES.
HARMFUL IF SWALLOWED OR INHALED.
KEEP AWAY FROM HEAT, SPARKS, FLAME. AVOID CONTACT WITH EYES, SKIN, CLOTHING.
AVOID BREATHING VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. IN CASE OF FIRE, USE ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE - WATER MAY BE INEFFECTIVE. FLUSH SPILL AREA WITH WATER SPRAY.

PRECAUTIONARY LABELING (CONTINUED)

INTERNATIONAL LABELING

HIGHLY FLAMMABLE. MAY FORM EXPLOSIVE PEROXIDES. IRRITATING TO EYES AND

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

RESPIRATORY SYSTEM.
KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING. DO NOT EMPTY INTO DRAINS.
TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.

SAF-T-DATA* STORAGE COLOR CODE: RED (FLAMMABLE)

COMPONENTS

COMPONENT ACGIH/TLV	CAS NO.	WEIGHT %	OSHA/PEL
TETRAHYDROFURAN PPM	109-99-9	90-100	200 PPM 200

PHYSICAL DATA

BOILING POINT: 66 C (150 F)
(AT 760 MM HG) VAPOR PRESSURE (MMHG): 129
(20 C)

MELTING POINT: -109 C (-164 F)
(AT 760 MM HG) VAPOR DENSITY (AIR=1): 2.5

SPECIFIC GRAVITY: 0.89
(H2O=1) EVAPORATION RATE: 8.0
(BUTYL ACETATE = 1)

SOLUBILITY(H2O): COMPLETE (100%) % VOLATILES BY VOLUME: 100
(21 C)

PH: N/A

ODOR THRESHOLD (P.P.M.): N/A PHYSICAL STATE: LIQUID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: COLORLESS LIQUID. ETHER-LIKE ODOR.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP): -14 C (6 F) NFPA 704M RATING: 2-3-1

AUTOIGNITION TEMPERATURE: 320 C (610 F)

FLAMMABLE LIMITS: UPPER - 11.8 % LOWER - 2.0 %

FIRE EXTINGUISHING MEDIA

USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. (WATER MAY BE INEFFECTIVE.)

SPECIAL FIRE-FIGHTING PROCEDURES

FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

VAPORS MAY FLOW ALONG SURFACES TO DISTANT IGNITION SOURCES AND FLASH BACK.

CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE. MAY FORM EXPLOSIVE PEROXIDES, ESPECIALLY WHEN HEATED.

TOXIC GASES PRODUCED
CARBON MONOXIDE, CARBON DIOXIDE

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT
NONE IDENTIFIED.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE
NONE IDENTIFIED.

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV/TWA): 590 MG/M (200 PPM)

SHORT-TERM EXPOSURE LIMIT (STEL): 735 MG/M (250 PPM)

PERMISSIBLE EXPOSURE LIMIT (PEL): 590 MG/M (200 PPM)

TOXICITY OF COMPONENTS

ORAL WOMAN LDLO FOR TETRAHYDROFURAN
25000PPM

ORAL RAT LD50 FOR TETRAHYDROFURAN 1650
MG/KG

INTRAPERITONEAL RAT LD50 FOR TETRAHYDROFURAN 2900
MG/KG

INHALATION-2HR RAT LC50 FOR TETRAHYDROFURAN 78
G/M

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: HEADACHE, NAUSEA, VOMITING, DIZZINESS, NARCOSIS,
RESPIRATORY FAILURE, LOW BLOOD PRESSURE, CENTRAL
NERVOUS SYSTEM DEPRESSION, COUGHING, DIFFICULT BREATHING

SKIN CONTACT: SEVERE IRRITATION OR BURNS

EYE CONTACT: SEVERE IRRITATION OR BURNS

SKIN ABSORPTION: DERMATITIS

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

INGESTION: HEADACHE, NAUSEA, VOMITING, DIZZINESS,
GASTROINTESTINAL IRRITATION

CHRONIC EFFECTS: KIDNEY DAMAGE, LIVER DAMAGE

TARGET ORGANS

EYES, SKIN, RESPIRATORY SYSTEM, CENTRAL NERVOUS SYSTEM, LIVER,
KIDNEYS

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
SKIN DISORDERS, RESPIRATORY SYSTEM DISEASE

PRIMARY ROUTES OF ENTRY

INHALATION, EYE CONTACT, SKIN CONTACT, INGESTION

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, DO NOT INDUCE
VOMITING. IF CONSCIOUS, GIVE LARGE AMOUNTS OF WATER.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING,
GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT,
GIVE OXYGEN. PROMPT ACTION IS ESSENTIAL.

SKIN CONTACT: IN CASE OF CONTACT, FLUSH SKIN WITH WATER.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH WITH PLENTY
OF WATER FOR AT LEAST 15 MINUTES.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

ACUTE: YES CHRONIC: YES FLAMMABILITY: YES PRESSURE: NO REACTIVITY: NO

EXTREMELY HAZARDOUS SUBSTANCE: NO

CERCLA HAZARDOUS SUBSTANCE: YES CONTAINS FURAN, TETRAHYDRO- (RQ =
1000

LBS)

SARA 313 TOXIC CHEMICALS: NO

TSCA INVENTORY: YES

REACTIVITY DATA

STABILITY: STABLE
OCCUR

HAZARDOUS POLYMERIZATION: WILL NOT

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION, LIGHT,
AIR

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

INCOMPATIBLES: STRONG OXIDIZING AGENTS, STRONG REDUCING AGENTS,
STRONG BASES

DECOMPOSITION PRODUCTS: EXPLOSIVE PEROXIDES, CARBON MONOXIDE, CARBON
DIOXIDE

SPILL & DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE
CLOTHING. SHUT

OFF IGNITION SOURCES; NO FLARES, SMOKING OR FLAMES IN AREA. STOP
LEAK IF

YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE
UP

WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO
CONTAINER FOR LATER DISPOSAL. FLUSH AREA WITH WATER.

J. T. BAKER SOLUSORB(R) SOLVENT ADSORBENT IS RECOMMENDED FOR SPILLS OF
THIS
PRODUCT.

DISPOSAL PROCEDURE

DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL
ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: U213 (TOXIC WASTE)

INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET
TLV

REQUIREMENTS.

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE
TO
CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS UP

ORGANIC
1000 PPM, A CHEMICAL CARTRIDGE RESPIRATOR WITH

LEVEL, A
VAPOR CARTRIDGE IS RECOMMENDED. ABOVE THIS

RECOMMENDED.
SELF-CONTAINED BREATHING APPARATUS IS

EYE/SKIN PROTECTION: SAFETY GOGGLES, UNIFORM, APRON, POLYVINYL
ALCOHOLGLOVES ARE RECOMMENDED.

STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA* STORAGE COLOR CODE: RED (FLAMMABLE)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-
VENTILATED,

FLAMMABLE LIQUID STORAGE AREA. KEEP PRODUCT OUT OF LIGHT.

SPECIAL PRECAUTIONS

BOND AND GROUND CONTAINERS WHEN TRANSFERRING LIQUID. USE CAUTION

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

WHEN

OPENING CAP. IMPORTANT - DO NOT USE AFTER EXPIRATION DATE.

TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: TETRAHYDROFURAN
HAZARD CLASS: 3
UN/NA: UN2056 REPORTABLE QUANTITY: 1000 LBS. PACKAGING GROUP: II
LABELS: 3 FLAMMABLE LIQUID
REGULATORY REFERENCES: 49CFR 172.101

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: TETRAHYDROFURAN
HAZARD CLASS: 3.2 I.M.O. PAGE: 3282
UN: UN2056 MARINE POLLUTANTS: NO PACKAGING GROUP: II
LABELS: 3 FLAMMABLE LIQUID
REGULATORY REFERENCES: 49CFR PART 176; IMDG CODE

AIR (I.C.A.O.)

PROPER SHIPPING NAME: TETRAHYDROFURAN
HAZARD CLASS: 3
UN: UN2056 PACKAGING GROUP: II
LABELS: 3 FLAMMABLE LIQUID
REGULATORY REFERENCES: 49CFR PART 175; ICAO=== WE BELIEVE THE
TRANSPORTATION

FACTUAL AND DATA AND REFERENCES CONTAINED HEREIN TO BE
MEANT AS THE OPINION OF QUALIFIED EXPERTS. THE DATA IS
PRODUCT A GUIDE TO THE OVERALL CLASSIFICATION OF THE
BE AND IS NOT PACKAGE SIZE SPECIFIC, NOR SHOULD IT
THE TAKEN AS A WARRANTY OR REPRESENTATION FOR WHICH
CONSIDERATION, COMPANY ASSUMES LEGAL RESPONSIBILITY.=== THE
IN INFORMATION IS OFFERED SOLELY FOR YOUR
LOCAL ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND
49CFR LAWS AND REGULATIONS. SEE SHIPPER REQUIREMENTS
TRAINING 49 171.2, CERTIFICATION 172.204, AND EMPLOYEE
CFR 173.1(B).

U.S. CUSTOMS HARMONIZATION NUMBER: 29321100006

MATERIAL SAFETY DATA SHEET

TETRAHYDROFURAN
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

NOTE: WHEN HANDLING LIQUID PRODUCTS, SECONDARY PROTECTIVE CONTAINERS MUST BE USED FOR CARRYING. N/A = NOT APPLICABLE, OR NOT AVAILABLE N/E = NOT ESTABLISHED. THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE REQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND REGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED IN, CHEMICAL HANDLING. THE USER IS RESPONSIBLE FOR DETERMINING THE PRECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR APPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND FACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL OR BREATHING CHEMICAL VAPORS/FUMES. EXPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS CHEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES ARE SO VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE OR INTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL. BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE. THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT HEeded. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET. NOTE: CHEMTREC, CANUTEC, AND NATIONAL RESPONSE CENTER EMERGENCY TELEPHONE NUMBERS ARE TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS. ALL NON-EMERGENCY QUESTIONS SHOULD BE DIRECTED TO CUSTOMER SERVICE (1-800-JTBAKER ASSISTANCE. COPYRIGHT 1995 J.T.BAKER INC. * TRADEMARKS OF J.T.BAKER INC. APPROVED BY QUALITY ASSURANCE DEPARTMENT.