

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL NAME: ENFLURANE, USP
LIST NUMBER: 9406

MANUFACTURER: HOSPITAL PRODUCTS DIVISION
ABBOTT LABORATORIES
ABBOTT PARK, ILLINOIS 60064

EMERGENCY TELEPHONE NUMBER: 1-847-937-7970
CHEMTREC TELEPHONE NUMBER: 1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME: ENFLURANE *
CAS/RTECS NUMBERS: 13838-16-9/KN6800000
OSHA-PEL 8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV 8HR TWA: 75 PPM (566 MG/M3)
STEL: N/L
CEILING: N/L
OTHER 8HR TWA: 75 PPM (566 MG/M3) [ABBOTT LABORATORIES]
LIMITS STEL: N/A
CEILING: N/A
* HAZARDOUS PER OSHA CRITERIA

3. HAZARDS INFORMATION

EMERGENCY OVERVIEW: THIS MATERIAL IS USED TO PRODUCE ANESTHESIA. IT IS AN EYE IRRITANT AND CAN CAUSE LIVER INJURY UNDER EXAGGERATED EXPOSURE CONDITIONS. TARGET ORGANS INCLUDE THE CARDIOVASCULAR SYSTEM, CENTRAL NERVOUS SYSTEM, AND RESPIRATORY SYSTEM.

ROUTE(S) OF ENTRY: SKIN: N/D
INHALATION: YES
INGESTION: NO

INGESTION RATING: NONE

SKIN ABSORPTION RATING: N/D

INHALATION RATING: NONE

CORROSIVENESS RATING: N/D

SKIN CONTACT RATING: N/D

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3. HAZARDS INFORMATION, CONTINUED

SKIN SENSITIZATION RATING: N/D

EYE CONTACT RATING: IRRITANT

TARGET ORGANS: CENTRAL NERVOUS SYSTEM, EYES, LIVER, CARDIOVASCULAR SYSTEM, RESPIRATORY SYSTEM, AND POSSIBLY REPRODUCTIVE SYSTEM.

CARCINOGENICITY RATING: NTP: N/L IARC: N/L OSHA: N/L
ACGIH: N/L
NONE

SIGNS AND SYMPTOMS: N/D. IN CLINICAL USE, ENFLURANE PRODUCES ANESTHESIA THAT CAN BE ACCOMPANIED BY HYPERTHERMIA, MUSCLE TWITCHING, RESPIRATION DEPRESSION, HYPOTENSION, ARRHYTHMIAS, SHIVERING, NAUSEA, VOMITING, ELEVATED WHITE BLOOD CELL COUNT AND LIVER INJURY. SUBCLINICAL CONCENTRATIONS HAVE PRODUCED IMPAIRMENT IN LEARNING, TRANSIENT AMNESIA, AND PSYCHOLOGICAL IMPAIRMENT.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: N/D. PATIENTS SENSITIVE TO CORTICAL STIMULATION; HYPERTHERMIA; CARDIOVASCULAR, RESPIRATORY OR LIVER AILMENTS; OR HYPERSENSITIVITY TO ENFLURANE OR OTHER HALOGENATED ANESTHETICS.

4. FIRST AID MEASURES

EYES: REMOVE FROM SOURCE OF EXPOSURE. FLUSH WITH COPIOUS AMOUNTS OF WATER. IF IRRITATION PERSISTS OR SIGNS OF TOXICITY OCCUR, SEEK MEDICAL ATTENTION. NO KNOWN ANTIDOTE. PROVIDE SYMPTOMATIC/SUPPORTIVE CARE, MAINTAINING VENTILATION WITH PURE OXYGEN, AS NECESSARY.

SKIN: REMOVE FROM SOURCE OF EXPOSURE. FLUSH WITH COPIOUS AMOUNTS OF WATER. IF IRRITATION PERSISTS OR SIGNS OF TOXICITY OCCUR, SEEK MEDICAL ATTENTION. NO KNOWN ANTIDOTE. PROVIDE SYMPTOMATIC/SUPPORTIVE CARE, MAINTAINING VENTILATION WITH PURE OXYGEN, AS NECESSARY.

INGESTION: REMOVE FROM SOURCE OF EXPOSURE. IF SIGNS OF TOXICITY OCCUR, SEEK MEDICAL ATTENTION. NO KNOWN ANTIDOTE. PROVIDE SYMPTOMATIC/SUPPORTIVE CARE, MAINTAINING VENTILATION WITH PURE OXYGEN, AS NECESSARY.

INHALATION: REMOVE FROM SOURCE OF EXPOSURE. IF SIGNS OF TOXICITY OCCUR, SEEK MEDICAL ATTENTION. NO KNOWN ANTIDOTE. PROVIDE SYMPTOMATIC/SUPPORTIVE CARE, MAINTAINING VENTILATION WITH PURE OXYGEN, AS NECESSARY.

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5. FIRE FIGHTING PROCEDURES

FLASH POINT: NON-FLAMMABLE
FLASH POINT METHOD: N/A
LOWER EXPLOSIVE LIMIT(%): N/D
UPPER EXPLOSIVE LIMIT(%): N/D
AUTOIGNITION TEMPERATURE: N/D

FIRE & EXPLOSION HAZARDS: ENFLURANE DOES NOT BURN.

EXTINGUISHING MEDIA: USE MEDIA APPROPRIATE FOR PRIMARY CAUSE OF FIRE.

FIRE FIGHTING INSTRUCTIONS: WEAR PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

6. ACCIDENTAL RELEASE MEASURES

SPILL OR RELEASE PROCEDURES: SPILLS IN POORLY VENTILATED AREAS PRESENT AN INHALATION HAZARD. ALL SPILLS, REGARDLESS OF ROOM VENTILATION CONDITIONS, REQUIRE CAREFUL HANDLING. RESTRICT SPILL AREA ACCESS TO ONLY THOSE EQUIPPED WITH PERSONAL PROTECTION SPECIFIED IN SECTION 8. ABSORB REMAINING LIQUID WITH SUITABLE MATERIAL AND CONTAINERIZE FOR DISPOSAL IN ACCORDANCE WITH SECTION 13.

7. HANDLING AND STORAGE

HANDLING: NO SPECIAL HANDLING REQUIRED.

STORAGE: RECOMMENDED STORAGE TEMPERATURE OF 25 DEGREES C.

SPECIAL PRECAUTIONS: PROTECT FROM FREEZING. AVOID EXCESSIVE HEAT.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: ANESTHETIC GAS SCAVENGING SYSTEMS SHOULD BE USED TO CONTROL WASTE ANESTHETIC. IN THE LABORATORY ENVIRONMENT, THIS PRODUCT SHOULD BE HANDLED IN A HOOD.

RESPIRATORY PROTECTION: IF ENGINEERING CONTROLS ARE IN PLACE, RESPIRATORS ARE GENERALLY NOT REQUIRED DURING NORMAL CONDITIONS OF USE. ENTRY INTO AREAS OF UNKNOWN AIRBORNE CONCENTRATION OF THIS PRODUCT SHOULD ONLY BE MADE WITH A SELF-CONTAINED BREATHING APPARATUS.

SKIN PROTECTION: UNDER NORMAL USE CONDITONS, NO SKIN PROTECTION IS ANTICIPATED. IF DIRECT SKIN CONTACT IS EXPECTED, IMPERVIOUS GLOVES \$PAGE

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION, CONTINUED

ARE RECOMMENDED.

EYE PROTECTION: UNDER NORMAL USE CONDITIONS, NO EYE PROTECTION IS ANTICIPATED. EYE PROTECTION SHOULD BE WORN IF EYE CONTACT IS LIKELY.

OTHER PROTECTION: N/A.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: CLEAR, COLORLESS, NON-FLAMMABLE LIQUID.

ODOR: CHARACTERISTIC ODOR

BOILING POINT: 56.5 C

MELTING/FREEZING POINT: N/L

VAPOR PRESSURE (MM HG): 174.5 MMHG AT 20 C

VAPOR DENSITY (AIR=1): N/L

EVAPORATION RATE: N/A

BULK DENSITY: N/D

SPECIFIC GRAVITY: 1.516 - 1.519 AT 25 DEGREES C.

SOLUBILITY: ORGANIC LIQUIDS, INCLUDING FATS AND OILS.

PH: N/L

VISCOSITY: N/L

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: PROTECT FROM FREEZING AND EXCESSIVE HEAT.

INCOMPATIBILITIES: N/D

HAZARDOUS DECOMPOSITION PRODUCTS: WHEN HEATED TO DECOMPOSITION IT EMITS VERY TOXIC FUMES OF F- AND CL-.

HAZARDOUS POLYMERIZATION: N/D

11. TOXICOLOGICAL INFORMATION

ORAL TOXICITY: LD50 = 5000-5450 MG/KG IN RATS AND MICE.

DERMAL TOXICITY: N/D

INHALATION TOXICITY: LC50 = 8100-31,500 PPM/3-4 HOURS IN ANIMALS.

CORROSIVENESS: N/D

DERMAL IRRITATION: N/D
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11. TOXICOLOGICAL INFORMATION, CONTINUED

OCULAR IRRITATION: ENFLURANE WAS MODERATELY IRRITATING TO THE EYES IN RABBITS.

DERMAL SENSITIZATION: N/D

SPECIAL TARGET ORGAN EFFECTS: N/D. CLINICALLY, ENFLURANE PRODUCES ANESTHESIA WITH A MINIMUM ALVEOLAR CONCENTRATION TO PRODUCE A SURGICAL PLAIN OF ANESTHESIA OF 16,800 PPM. A VERY SMALL AMOUNT OF AN INSPIRED DOSE (ABOUT 2.4%) IS METABOLIZED TO FLUORIDE CONTAINING METABOLITES. UNDER EXAGGERATED CONDITIONS, LARGE CONCENTRATIONS OF ENFLURANE HAVE PRODUCED INJURY TO THE LIVER, HEART AND SPLEEN AND PRODUCED MINOR SKELETAL VARIATIONS, ABNORMAL SPERMATOZOA, MATERNAL TOXICITY AND FETOTOXICITY IN ANIMALS STUDIES.

CARCINOGENICITY INFORMATION: N/D

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: N/D

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

14. TRANSPORTATION INFORMATION

DOT STATUS: NOT REGULATED
PROPER SHIPPING NAME: N/A
HAZARD CLASS: N/A
UN NUMBER: N/A
PACKING GROUP: N/A
REPORTABLE QUANTITY: N/A

IATA/ICAO STATUS: REGULATED
PROPER SHIPPING NAME: OTHER REGULATED SUBSTANCES (ENFLURANE).
HAZARD CLASS: 9
UN NUMBER: ID 8027
PACKING GROUP: III
REPORTABLE QUANTITY: N/A
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14. TRANSPORTATION INFORMATION, CONTINUED

IMO STATUS: NOT REGULATED
PROPER SHIPPING NAME: N/A

HAZARD CLASS: N/A
UN NUMBER: N/A
PACKING GROUP: N/A
REPORTABLE QUANTITY: N/A
FLASH POINT: NON-FLAMMABLE

15. REGULATORY INFORMATION

TSCA STATUS: N/A

CERCLA STATUS: N/L

SARA STATUS: N/L

RCRA STATUS: N/L

PROP 65 (CA): N/L

16. OTHER INFORMATION

LEGEND: N/A = NOT APPLICABLE

N/D = NOT DETERMINED

N/L = NOT LISTED

L = LISTED

C = CEILING

S = SHORT-TERM

(R) = REGISTERED TRADEMARK OF ABBOTT LABORATORIES

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