

MATERIAL SAFETY DATA SHEET

Date prepared: March 23, 2004

page 1 of 5

1. Product and Company Identification

PRODUCT IDENTIFIER: **K-tert.-Butylate**

SYNONYMS: Potassium t-butoxide (KTB)

PRODUCT USE: Strong base for deprotonations and base-catalyzed reactions

MANUFACTURED BY: BASF Corporation

1424 Mars-Evans City Road

Evans City, PA 16033

Customer Service: 1-866-4BORANES (24-Hour Telephone: 1-724-538-3510)

Transportation Emergency: 1-800-424-9300 in USA or 1-703-527-3887

BASF HOTLINE 24-Hour Emergency Response Information: 1-800-832-HELP

2. Composition/Information on Ingredients

	<u>wt%</u>	<u>Synonym(s)</u>
Potassium t-butoxide (CASRN: 865-47-4)	~100	KTB; K-t-butylate; 2-propanol, 2-methyl-, potassium salt

OSHA REGULATORY STATUS: Hazardous by definition of Hazard Communication Standard, 29 CFR 1910.1200.

3. Hazards Identification

Indications of danger (Annex II): F (Highly Flammable), C (Corrosive)

Nature of special risk attributed to dangerous substances (Annex III): R11, R14, R35

Safety advice concerning dangerous chemical substances (Annex IV): S6.1, S33, S7/8, S22, S36/37/39, S26, S43.5, S45

EMERGENCY OVERVIEW: Potassium t-butoxide is a white to off-white powder with no odor or a faint t-butyl alcohol odor. Causes severe eye, skin, and respiratory tract burns. Reacts vigorously and exothermically with water, acids, or alcohols releasing flammable vapors which can ignite. Flammable solid. May form explosive dust-air mixtures.

PHYSICAL HAZARDS: Water reactive. Reacts vigorously and exothermically with water, acids, or alcohols releasing flammable vapors which can ignite. Flammable solid. May form explosive dust-air mixtures. Not corrosive to steel; however, may be corrosive to other materials.

POTENTIAL HEALTH EFFECTS: Causes severe eye, skin, and respiratory tract burns.

Primary Routes of Entry: Eye and skin contact, inhalation, ingestionTarget Organs: Eyes, skin, respiratory tractMedical Conditions Generally Recognized as Aggravated by Exposure: Persons with preexisting skin and respiratory conditions may be more susceptible to the effects of this product.Carcinogenicity: KTB is not listed in the National Toxicology Program (NTP) Annual Report on Carcinogens, not found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs, and not listed as an OSHA carcinogen.

POTENTIAL ENVIRONMENTAL EFFECTS: No environmental toxicity data for the product. KTB reacts with water to produce potassium hydroxide (KOH) that may increase the pH of water and/or soil to create conditions that may kill fish and other living organisms. See Section 12 for additional information.

4. First Aid Measures

CAUSES SEVERE ALKALI BURNS! SEND TO A PHYSICIAN IN ALL CASES.

Note: Immediately flushing with plenty of water is the appropriate eye and skin emergency first aid treatment for this water-reactive chemical. For the eye, it is extremely important that flushing with water (with the eyelids held open) begins within the first minute after potassium t-butoxide has entered the eye and continues for the full 20 minutes. If large amounts of potassium t-butoxide are involved, caustic and flammable fumes and solutions may be produced during the emergency first aid treatment procedure; therefore, emergency showers should be adequately ventilated and equipped to handle caustic and flammable fumes and solutions that emergency first aid treatment may generate.

Eyes: Immediately flush eyes with plenty of water for at least 20 minutes while holding eyelids open.

Skin: Immediately flush skin with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Dispose of contaminated clothing and shoes in compliance with all local, state, and federal laws and regulations.

Ingestion: For any accidental contamination of the mouth, gargle with water and rinse mouth thoroughly for at least 20 minutes. If swallowed, do not induce vomiting. Give demulcent such as milk, olive oil, or margarine in small amounts up to 2 or 3 ounces. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Note to Physician: For eyes, serious alkali burns may require 2 hours of irrigation. Testing of the conjunctival sac with wide-range pH test paper, such as pHydrion paper (pH1 to pH11) every five to ten minutes in the course of irrigation can be used to obtain a measure of the rate at which the pH is returning to a tolerable value, such as a pH of 8 or 8.5. (It should not be expected to come to pH 7.) Grant, W. Morton, and Joel S. Schuman, Toxicology of the Eye, Charles C. Thomas, Springfield, IL, 1993.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: Water reactive and flammable solid

Flashpoint (closed cup): Not applicable (11.7°C/53°F for t-butyl alcohol)

Flammable limits (for t-butyl alcohol): LFL: 2.4% UFL: 8.0%

Autoignition Temperature: 483°C

EXTINGUISHING MEDIA: Use dry chemical extinguisher, DRY soda ash, or DRY sand.

DO NOT use water, carbon dioxide, halogenated, or foam extinguishing agents.

UNUSUAL FIRE AND EXPLOSION HAZARDS: KTB reacts vigorously and exothermically with water, moist air, alcohols, and acids liberating flammable alcohol vapors which can be ignited. Containers can buildup pressure if exposed to heat.

PROTECTION OF FIRE FIGHTERS: Wear full protective clothing, including protective gloves and boots. For respiratory protection, wear a NIOSH-approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode. Protect against caustic smoke, fumes, and waters.

6. Accidental Release Measures

PROCEDURES FOR CLEANUP: Wear recommended personal protective clothing. Be prepared to fight fire. Eliminate ignition sources. Do not flush spill to drain. Scoop solids into a DRY metal container, properly label, and cover. Take immediately to a waste handling area. Handle in compliance with all local, state, and federal laws and regulations.

7. Handling And Storage

HYGIENIC PRACTICES: Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Keep container tightly closed. Do not breathe dust. Use only with adequate ventilation.

STORAGE: Store under DRY nitrogen gas in a cool, DRY, well-ventilated place.

WORK PRACTICES: Keep away from heat, sparks, flame, and any possible contact with water, moist air, alcohols, or acids, and other incompatible materials. Avoid exposure to air. Avoid creating dust. Handle and store in a closed system under DRY nitrogen gas. Use DRY nitrogen gas to inert drums, transfer lines, vessels, tanks, etc., such that the atmosphere stays below 3% oxygen. Use non-sparking tools when opening or closing containers. Bond and ground all systems when handling. Since empty containers retain product residue, follow label warnings even after container is emptied.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT: See Section 8.

8. Exposure Controls/Personal Protection

ENGINEERING CONTROLS: Maintain a leakproof system. Use packless valves, welded piping, and other leakproof construction. Handle in a closed system under DRY nitrogen gas. Provide adequate local exhaust ventilation to minimize worker exposure. Prevent electrostatic charge buildup by using common bonding and grounding techniques. Use DRY nitrogen gas to inert drums, transfer lines, vessels, tanks, etc., such that the atmosphere stays below 3% oxygen.

EXPOSURE CONTROLS: None established for the product, potassium t-butoxide.

For potassium hydroxide: ACGIH TLV-C: 2 mg/m³ (ceiling)

OSHA PEL-TWA: none

NIOSH REL-TWA: 2 mg/m³

No IDLH established for potassium hydroxide.

Note that the IDLH for sodium hydroxide is 10 mg/m³.

PERSONAL PROTECTIVE EQUIPMENT:

Normal Use & Handling: When exposure to eyes and skin is possible, wear chemical protective goggles with a faceshield and flame-retardant protective clothing. Glove permeation data does not exist for this mixture. Exposure limits have not been established for potassium t-butoxide. When inhalation of dust is possible, wear a NIOSH-approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode. Eye wash and safety showers must be available and in good working order.

Emergency Handling: For firefighting, wear full protective clothing, including protective gloves and boots. For chemical spills, wear special protective clothing (vapor-protective suit with additional chemical flash fire escape protection, as specified in NFPA 1991). For respiratory protection, wear a NIOSH-approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode.

9. Physical And Chemical Properties

APPEARANCE: White to off-white powder

ODOR: No odor or a faint t-butyl alcohol odor

BOILING POINT: Sublimes at 220°C at 1 mm Hg, 180°C at 0.05 mm Hg

MELTING POINT: 464°F/240°C

BULK DENSITY: ~33-35 pounds/foot³

SOLUBILITY IN WATER: Reacts vigorously and exothermically, releasing flammable alcohol vapors

STABILITY TO AIR: Hygroscopic material; in moist air, KTB will hydrolyze releasing flammable alcohol vapor

FORMULA: KOC(CH₃)₃

10. Stability And Reactivity

STABILITY (CONDITIONS TO AVOID): Stable. Keep away from heat, sparks, and flame.

INCOMPATIBILITY (SPECIFIC MATERIALS TO AVOID): Water, moist air, alcohols, acids, halogenated hydrocarbons, oxidizers, carbon dioxide, halogens, substances with active hydrogen.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, potassium oxides, potassium hydroxide, t-butanol

HAZARDOUS POLYMERIZATION: Not expected to occur.

11. Toxicological Information

KTB, KTB dust, and the hydrolysis product (KOH) are all caustic to the skin and will cause burns to the eyes, skin, or mucous membranes of the respiratory tract. If skin and air are dry, powder on skin may not cause irritation and burns. Worker will notice a slippery feeling on washing. However, if moisture is present, powder can cause severe burns. Inhalation of the powder will cause sneezing, irritation, and burns. Eyes may redden from dust in the air. If powder gets in eyes, burns will occur.

No information is available on oral, dermal, inhalation, or sensitization testing.

TOXICITY DATA: No information found for the product.

12. Ecological Information

ECOLOGICAL DATA: No environmental toxicity data for the product.

KTB reacts with water to produce potassium hydroxide (KOH) that may increase the pH of water and/or soil to create conditions that may kill fish and other living organisms.

13. Disposal Considerations

WASTE DISPOSAL: Do not flush to sewer. Dispose in compliance with all local, state, and federal laws and regulations.

14. Transport Information

HAZARDOUS MATERIALS/DANGEROUS GOODS CLASSIFICATION:

Proper Shipping Name: Corrosive solid, water-reactive, n.o.s. (potassium t-butoxide)

Hazard Class: 8 (Subsidiary Hazard Class: 4.3 & 4.1)

Packaging Group: I

Identification Number: UN3096

15. Regulatory Information

TSCA: Potassium t-butoxide is listed on the TSCA Public Inventory.

SARA 313 INFORMATION: Potassium t-butoxide contains no chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.

CERCLA/SUPERFUND: No Reportable Quantity (RQ) listed for potassium t-butoxide.

EINECS: 212-740-3 for potassium t-butoxide

EUROPEAN LABEL INFORMATION:

Symbols: F, C

Indications of danger (Annex II): Highly Flammable, Corrosive

Nature of special risk attributed to dangerous substances (Annex III):

R11	Highly flammable.
R14	Reacts violently with water.
R35	Causes severe burns.
Safety advice concerning dangerous chemical substances (Annex IV):	
S6.1	Keep under DRY nitrogen.
S33	Take precautionary measures against static discharges.
S7/8	Keep container tightly closed and dry.
S22	Do not breathe dust.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S26	In case of contact with eye, rinse immediately with plenty of water and seek medical advice.
S43.5	In case of fire use extinguishing powder and sand. Never use water.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

CALIFORNIA: This product does not contain a chemical known to the State of California to cause cancer.

PENNSYLVANIA: This product contains no chemicals subject to the Pennsylvania Worker and Community Right-to-Know Act.

16. Other Information

MSDS STATUS: Revised Sections 1, 15, and 16.

IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE, IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OR ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITION OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY BASF HEREUNDER ARE GIVEN GRATIS AND BASF ASSUMES NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK.

© 2004

file: KTB-MSDS-ANSI-98-R4-BASF