



Product Information (203) 740-3471 / Emergency Assistance CHEMTREC 1-800-424-9300

## MATERIAL SAFETY DATA SHEETS

Manufacturer: PHARMCO-AAPER  
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### SEC-BUTYL ALCOHOL

#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: sec-Butyl Alcohol

Synonyms: 2-Butanol; Butan-2-ol; s-Butyl alcohol; 2-Butyl alcohol; Butylene hydrate; Ethyl methyl carbinol; 2-Hydroxybutane; Methyl ethyl carbinol; 1-Methylpropanol; SBA; (+/-)-2-Butanol

Chemical Formula: C<sub>2</sub>H<sub>5</sub>CH(OH)CH<sub>3</sub>

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

#### 2. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
sec-Butyl Alcohol	78-92-2	>99%	Yes

#### 3. HAZARDS IDENTIFICATION

WARNING! FLAMMABLE LIQUID AND VAPOR. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. BREATHING VAPORS MAY CAUSE DROWZINESS AND DIZZINESS. MAY FORM EXPLOSIVE PEROXIDES. TARGET ORGANS: CENTRAL NERVOUS SYSTEM, RESPIRATORY SYSTEM, EYES.

***Acute Exposure Hazards:***

Inhalation Hazard: May cause central nervous system effects characterized by excitement followed by headache, drowsiness, nausea, and vomiting. Advanced stages may cause collapse, unconsciousness, and coma. Causes respiratory tract irritation. Vapors may cause dizziness or suffocation. May cause blood changes.

Ingestion Hazard: Causes gastrointestinal irritation with nausea, vomiting, and diarrhea. May cause central nervous system depression with excitement followed by headache, drowsiness, nausea, and vomiting. Advanced stages may cause collapse, unconsciousness, coma, and possible death. Aspiration into lungs may cause chemical pneumonitis, which may be fatal.

Skin Contact Hazard: Brief exposure are not expected to cause irritation. Repeated or prolonged exposure may cause drying and cracking of skin.

Eye Contact Hazard: Causes eye irritation.

***Chronic Exposure Hazards:*** Repeated or prolonged exposure may cause dermatitis and defatting of skin. May cause liver and kidney damage. May cause lung damage. Animal evidence suggests that fetotoxicity and teratogenicity may be

observed at doses that also cause harm to the mother.

Teratogenic: Some effects indicated.

#### 4. FIRST-AID MEASURES

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

Ingestion: Potential aspiration hazard if swallowed. Get medical help immediately. Do not induce vomiting unless directed by medical personnel. If vomiting occurs naturally, have victim lean forward. Never give anything by mouth to an unconscious person.

Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation persists.

Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention.

Notes to Physician: Treat symptomatically and supportively.

#### 5. FIRE FIGHTING MEASURES

Flammability: Flammable liquid and vapor

Auto-ignition Temperature: 405° C (761° F)

Flash Point: 24° C (75° F)

Flammable Limits: Lower Limit – 1.7 vol %, Upper Limit – 9.8 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (carbon monoxide and carbon dioxide).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Vapors may form explosive mixtures with air. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Fire Fighting Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

#### 6. ACCIDENTAL RELEASE MEASURES

Use water spray to reduce vapors. Water spray may reduce vapors but still not prevent ignition in closed spaces. Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Do not use sawdust or any combustible material. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

#### 7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist. Do not allow to evaporate to near dryness. Do not store in aluminum equipment at temperatures over 120° F.

Storage: Keep in a flammables area away in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Storage under a nitrogen blanket has been recommended. Do not store in aluminum containers. Keep away from sources of ignition. Containers should be dated when opened and tested periodically for the presence of peroxides. All peroxidizable substances should be stored away from heat and light and be protected from ignition sources.

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear chemical splash goggles. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

ACGIH – 100 ppm TWA

NIOSH – 100 ppm TWA; 305 mg/m<sup>3</sup> TWA; 2000 ppm IDLH;

OSHA Final PELs – 150 ppm TWA; 450 mg/m<sup>3</sup> TWA

OSHA Vacated PELs: 100 ppm TWA; 305 mg/m<sup>3</sup> TWA

Eye Protection: Wear protective chemical goggles or other appropriate eye protection.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Strong sweet. Fruity odor

Odor Threshold: Not available

Taste: Not available

Molecular Formula: C<sub>2</sub>H<sub>5</sub>CH(OH)CH<sub>3</sub>

Molecular Weight: 74.12

pH: Not available.

Boiling Point: 99.5° C @ 760 mm Hg

Freezing/Melting Point: -115° C

Decomposition Temperature: Not available

Specific Gravity: 0.808 g/cm<sup>3</sup>

Vapor Density (Air=1): 2.6

Vapor Pressure: 12 mm Hg @ 20° C.

Evaporation Rate (Butyl acetate = 1): Not available.

Viscosity: 3.5 cP 20° C

Solubility: Slightly soluble

## 10. STABILITY AND REACTIVITY

Stability: Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when subjected to heat or shock. This material is most hazardous when peroxide levels are concentrated by distillation or evaporation.

Conditions to Avoid: High temperatures, light, ignition sources.

Incompatibility With Various Substances: Strong oxidizing agents, strong acids, aluminum, organic peroxides, isocyanates, aliphatic amines, chromium trioxide.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

## 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Animal Toxicity (RTECS):

Inhalation, rat: LC50 = 48,500 mg/m<sup>3</sup>/4H;

Oral, rabbit: LD50 = 4893 mg/kg;

Oral, rabbit: LD50 = 4900 mg/kg;

Oral, rat: LD50 = 2193 mg/kg;

Oral, rat: LD50 = 6200 mg/kg;

Skin, rat: LD50 = >2 g/kg;

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: No information available.

Teratogenicity: Inhalation, rat: TCl<sub>o</sub> = 5000 ppm/7H (female 1-19 days after conception) Effects on embryo or fetus - toxicity (except death e.g. stunted fetus); Inhalation, rat: TCl<sub>o</sub> = 7000 ppm/7H (female 1-19 days after conception) Effects on embryo or fetus – fetal death and specific developmental abnormalities – musculoskeletal system.

Reproductive Effects: Inhalation, rat: TCl<sub>o</sub> = 7000 ppm/7H (female 1-19 days after conception) fertility - post implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

Mutagenicity: No information available.

Neurotoxicity: No information available.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity:

Fish: Goldfish: LC50 = 4300 mg/L, 24H, unspecified;

If released to the soil, sec-butanol will leach into the ground. It should volatilize from dry soil and biodegradation will probably be the key process affecting fate in the soil. If released to the water, biodegradation will also probably be the key process affecting fate in the water.

Environmental Fate: Adsorption to sediment and bioconcentration in fish will not be significant transportation processes. In the atmosphere, sec-butanol will be lost by reaction with photochemically produced hydroxyl radicals. Estimated half-life is 2 days.

Physical: Log P (oct) = 0.61.

## 13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. This material is neither a "P" listed waste nor a "U" listed waste under 40 CFR 261.33. .

## 14. TRANSPORT INFORMATION

### US DOT

Proper Shipping Name: Butanols

Hazard Class: 3

UN Number: UN1120

Packing Group: III

### Canada TDG

Proper Shipping Name: Butanols

Hazard Class: 3

UN Number: UN1120

Packing Group: III

Additional Information: Flashpoint 26 C

### International (Water, I.M.O.)

Proper Shipping Name: Butanols

Hazard Class: 3

UN Number: UN1120

Packing Group: III

### International (Air, I.C.A.O.)

Proper Shipping Name: Butanols

Hazard Class: 3

UN Number: UN1120

Packing Group: III

## 15. REGULATORY INFORMATION

US Federal Regulations:

TSCA: CAS# 78-92-2 is listed on the TSCA Inventory.

Health and Safety Reporting List: Not listed.

Chemical Test Rules: CAS# 78-92-2: Not listed.

Section 12b: Not listed.

TSCA Significant New Use Rule: Does not have an SNUR under TSCA.

CERCLA Hazardous Substances: CAS# 78-92-2 does not have an RQ

SARA Section 302: Does not have a TPO

SARA Codes: CAS# 78-92-2 – immediate, delayed, fire, reactive

Section 313: sec-butanol (CAS# 78-92-2) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.

Clean Air Act: CAS# 78-92-2 is not listed as a hazardous air pollutant (HAP). It is not a Class 1 Ozone Depleter. It is not a Class 2 Ozone Depleter.

Clean Water Act: CAS# 78-92-2 is not listed as a Hazardous Substance. It is not a Priority Pollutant. It is not a Toxic Pollutant.

OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 78-92-2 is on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts

California Prop 65: California No Significant Risk Level: Not listed

Canada:

DSL/NDSL: CAS# 78-92-2 is listed on Canada's DSL list.

WHMIS: This product has a WHMIS classification of B2, D2B. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations.

Ingredient Disclosure List: CAS#78-92-2 is listed on Canada's Ingredient Disclosure List.

DSCL (EEC):

Hazard Symbols: Xi

Risk Phrases: R10 – Flammable; R36/37 – Irritating to eyes and respiratory system; R67 – vapors may cause dizziness and dizziness.

Safety Phrases: S7/9 – Keep container tightly closed and in a well-ventilated place; S13 – Keep away food, drinks, and animal feeding stuffs; S24/25 – Avoid contact with skin and eyes; S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S46 – If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/protection): CAS# 78-92-2: 1

National Fire Protective Association: Health - 2, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings involve data and interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

## 16. OTHER INFORMATION

Originally Prepared: 1/1/2006

Last Revised: 12/20/2007

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.