sec-Butanol, 99%
MSDS# 20410

Section 1 - Chemical Product and Company Identification

MSDS Name: sec-Butanol, 99%
Catalog Numbers:
10770-0000, 10770-0010, 10770-0025, 10770-0200, 22029-0000, 22029-0010,
61026-1000, B/5200/08, B/5200/15, B/5200/17, B/5200/21, B/5200/25,
B/5200/PB17, B/5210/15, B/5210/17, B/5210/PB17

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

Company Identification: Fisher Scientific UK
Bishop Meadow Road, Loughborough
Leics. LE11 5RG
For information in Europe, call: (01509) 231166
Emergency Number, Europe: 01509 231166

Section 2 - Composition, Information on Ingredients

CAS#: 78-92-2
Chemical Name: sec-Butyl alcohol
%: 99
EINECS#: 201-158-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Flammable. Irritating to eyes and respiratory system. Vapours may cause drowsiness and dizziness.

Potential Health Effects

Eye:
Causes eye irritation. Vapors cause eye irritation.

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

Ingestion:
Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation:
Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Vapors may cause dizziness or suffocation. May cause blood changes.

Chronic:
Prolonged or repeated skin contact may cause defatting and
dermatitis. 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 harmful effects in the mothers.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

If vomiting occurs naturally, have victim lean forward.

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Flammable liquid and vapor. 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. This liquid floats on water and may travel to a source of ignition and spread fire.

Extinguishing Media: Use water spray, alcohol foam, CO2, dry chemical.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring
Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Do not allow to evaporate to near dryness. Do not store or handle in aluminum equipment at temperatures over 120 °F.

Storage:
Keep away from heat, sparks, and flame. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Storage under a nitrogen blanket has been recommended. Do not store in aluminum containers. 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.

Section 8 - Exposure Controls, Personal Protection
Engineering Controls:
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits
CAS# 78-92-2:
United Kingdom, WEL - TWA: 100 ppm TWA; 308 mg/m³ TWA
United Kingdom, WEL - STEL: 150 ppm STEL; 462 mg/m³ STEL
United States OSHA: 150 ppm TWA; 450 mg/m³ TWA
Belgium - TWA: 100 ppm VLE; 307 mg/m³ VLE
France - VME: 100 ppm VME; 300 mg/m³ VME
Japan: 100 ppm OEL; 300 mg/m³ OEL
Malaysia: 100 ppm TWA; 303 mg/m³ TWA
Netherlands: 150 ppm MAC; 450 mg/m³ MAC
Russia: 10 mg/m³ TWA (vapor)
Russia: 30 mg/m³ STEL (vapor)
Spain: 100 ppm VLA-ED; 308 mg/m³ VLA-ED

Personal Protective Equipment
Eyes:
Wear chemical splash goggles.

Skin:
Wear appropriate protective gloves to prevent skin exposure.

Clothing:
Wear appropriate protective clothing to prevent skin exposure.

Respirators:
A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties
Physical State: Liquid
Color: clear, colorless
Odor: strong odor - sweet, fruity odor
pH:                         Not available
Vapor Pressure:             12 mm Hg @ 20 deg C
Viscosity:                  3.5 cps @ 20 deg C
Boiling Point:              99.5 deg C @ 760 mmHg (211.10 F)
Freezing/Melting Point:     -115 deg C (-175.00 F)
Autoignition Temperature:   405 deg C (761.00 deg F)
Flash Point:                24 deg C (75.20 deg F)
Explosion Limits: Lower: 1.7% @ 100 C
Explosion Limits: Upper: 9.8% @ 100 C
Decomposition Temperature:  Not available
Solubility in water:        12.5 g/100 ml @ 20 C
Specific Gravity/Density:   0.808 g/ml
Molecular Formula:          C4H10O
Molecular Weight:           74.12

Section 10 - Stability and Reactivity

Chemical 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.

Incompatibilities with Other Materials
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.

RTECS#:
CAS# 78-92-2: EO1750000
LD50/LC50:
RTECS: CAS# 78-92-2: Inhalation, rat: LC50 = 48500 mg/m3/4H; 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 gm/kg;.
Carcinogenicity:
sec-Butyl alcohol -
Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other:
No information found.

Section 11 - Toxicological Information

Ecotoxicity:
Fish: Goldfish: LC50 = 4300 mg/L; 24 Hr; Unspecified

Section 12 - Ecological Information

Dispose of in a manner consistent with federal, state, and local regulations.

Section 13 - Disposal Considerations

IATA
Shipping Name:           BUTANOLS
Hazard Class:            3
UN Number:              1120
Packing Group:          III

IMO
Shipping Name:           BUTANOLS
Hazard Class:            3.3
UN Number:               1120
Packing Group:           III

RID/ADR
Shipping Name:           BUTANOLS
Hazard Class:            3
UN Number:               1120
Packing Group:           III

Section 15 - Regulatory Information

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XI
Risk Phrases:
R 10  Flammable.
R 36/37  Irritating to eyes and respiratory system.
R 67  Vapours may cause drowsiness and dizziness.

Safety Phrases:
S 7/9  Keep container tightly closed and in a well-ventilated place.
S 13  Keep away from food, drink and animal feeding stuffs.
S 24/25  Avoid contact with skin and eyes.
S 26  In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 46  If swallowed, seek medical advice immediately and show this container or label.

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

Canada
CAS# 78-92-2 is listed on Canada's DSL List

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

Section 16 - Other Information

MSDS Creation Date:
7/19/1999
Revision #8 Date
6/06/2006
Revisions were made in Sections: 9

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