

Material Safety Data Sheet

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Version 1.2

According to 91/155/EEC

1 - Product and Company Information

Product Name PIPERONYL BUTOXIDE, TECH., 90%
 Product Number 291102

Company Sigma-Aldrich Pte Ltd
 #08-01 Citilink Warehouse
 Singapore 118529
 Singapore

Technical Phone # 65 271 1089
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
PIPERONYL BUTOXIDE	51-03-6	200-076-7	None

Formula C19H30O5
 Molecular Weight 338.45 AMU
 Synonyms 1,3-Benzodioxole,
 5-((2-(2-butoxyethoxy)ethoxy)methyl)-6-propyl- *
 Butacide * Butocide * Butoxide * Butoxide
 (synergist) *
 alpha-(2-(2-Butoxyethoxy)ethoxy)-4,5-methylenedioxy-2-propyltoluene *
 alpha-(2-(2-n-Butoxyethoxy)-ethoxy)-4,5-methylene dioxo-2-propyltoluene *
 5-((2-(2-Butoxyethoxy)ethoxy)methyl)-6-propyl-1,3-benzodioxole * Butyl carbitol 6-propylpiperonyl ether * Butyl-carbityl (6-propylpiperonyl) ether * ENT 14,250 * FMC 5273 *
 3,4-Methylenedioxy-6-propylbenzyl-n-butyl-diaethyl englykolaether (German) *
 3,4-Methylenedioxy-6-propylbenzyl n-butyl diethyleneglycol ether * NCI-C02813 * NIA 5273 *
 Nusyn-noxfish * Piperonyl butoxide *
 6-(Propylpiperonyl)-butyl carbityl ether *
 6-Propylpiperonyl butyl diethylene glycol ether *
 5-Propyl-4-(2,5,8-trioxa-dodecyl)-1,3-benzodioxol (German)

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Toxic in contact with skin. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Avoid prolonged or repeated exposure. Do not get in eyes, on skin, on clothing.

STORAGE

Conditions of Storage: Keep tightly closed.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Liquid	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	180 °C	1 mmHg
MP/MP Range	N/A	
Flash Point	171 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	1.059 g/cm ³	
Partition Coefficient	Log Kow: 4.29	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: XS8050000

ACUTE TOXICITY

LC50

Inhalation

Rat

> 5,900 mg/m³

4 H

LD50

Oral

Rat
6150 mg/kg

LD50
Skin
Rat
> 7950 mg/kg

LD50
Oral
Mouse
2600 mg/kg
Remarks: Behavioral:Somnolence (general depressed activity).
Behavioral:Tremor. Skin and Appendages: Other: Hair.

LD50
Oral
Dog
7500 UL/KG

LD50
Oral
Rabbit
2650 mg/kg

LD50
Skin
Rabbit
200 mg/kg

SIGNS AND SYMPTOMS OF EXPOSURE

Ingestion of large amounts causes vomiting and diarrhea. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: Toxic if absorbed through skin.
Eye Contact: May cause eye irritation.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: May be harmful if swallowed.

CHRONIC EXPOSURE - CARCINOGEN

Rat
Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors.

Mouse
Route of Application: Oral
Exposure Time: 1Y
Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors.

Mouse
Route of Application: Subcutaneous
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Liver:Tumors.

Mouse
Route of Application: Oral

Exposure Time: 1Y
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Human
50 UG/L
Cell Type: Embryo
Mutation in mammalian somatic cells.

Mouse
30 MG/L
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Hamster
500 UG/L
Cell Type: Embryo
Morphological transformation.

Hamster
250 UMOL/L
Cell Type: ovary
Sister chromatid exchange

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 3600 MG/KG
Route of Application: Oral
Exposure Time: (11-12D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 1065 MG/KG
Route of Application: Oral
Exposure Time: (9D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 89600 UG/KG
Route of Application: Oral
Exposure Time: (MULTIGENERATION)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral.

Species: Mouse
Dose: 9 GM/KG
Route of Application: Subcutaneous
Exposure Time: (6-14D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Eye, ear.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 3 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 2130 MG/KG
Route of Application: Oral
Exposure Time: (11-12D PREG)
Result: Maternal Effects: Other effects. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).
Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 5 GM/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 1385 MG/KG
Route of Application: Oral
Exposure Time: (9D PREG)
Result: Effects on Newborn: Behavioral.

Species: Mouse
Dose: 200 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (1D MALE)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 9 GM/KG
Route of Application: Subcutaneous
Exposure Time: (6-14D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).

12 - Ecological Information

BIOACCUMULATION POTENTIAL: Indication of bioaccumulation.

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 0.51 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h

Value: 6.12 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 2810
Class: 6.1
PG: II
Proper Shipping Name: Toxic liquid, organic, n.o.s.

IMDG

UN#: 2810
Class: 6.1
PG: II
Proper Shipping Name: Toxic liquid, organic, n.o.s.
Marine Pollutant: No
Severe Marine Pollutant: No
Technical Name: Required

IATA

UN#: 2810
Class: 6.1
PG: II
Proper Shipping Name: Toxic liquid, organic, n.o.s.
Inhalation Packing Group I: No
Technical Name: Required

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

INDICATION OF DANGER: T N

Toxic. Dangerous for the environment.

R-PHRASES: 24 50/53

Toxic in contact with skin. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASES: 36/37 45 60 61

Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

SWITZERLAND

SWISS POISON CLASS: 4

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to

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