



Safety Data Sheet acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

1 Identification

- **Product identifier**
- **Trade name:** PBD-BODIPY
- **Article number:** 27945
- **Application of the substance / the mixture**
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Cayman Chemical Co.
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
USA
- **Information department:** Product safety department
- **Emergency telephone number:**
During normal opening times: +1 (734) 971-3335
US/CANADA: 800-424-9300
Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flammable Liquids 2

H225 Highly flammable liquid and vapor.



GHS06 Skull and crossbones

Acute Toxicity - Dermal 1

H310 Fatal in contact with skin.



GHS08 Health hazard

Germ Cell Mutagenicity 1A

H340 May cause genetic defects.

Carcinogenicity 1A

H350 May cause cancer.

Specific Target Organ Toxicity - Repeated Exposure
1

H372 Causes damage to the central nervous system and the hematopoietic system through prolonged or repeated exposure.

Aspiration Hazard 1

H304 May be fatal if swallowed and enters airways.

(Contd. on page 2)

US

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 1)



GHS07

Acute Toxicity - Oral 4

Skin Irritation 2

Eye Irritation 2A

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

- **Label elements**

- **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**



GHS02 GHS06 GHS07 GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**

Benzene

- **Hazard statements**

H225 Highly flammable liquid and vapor.

H302 Harmful if swallowed.

H310 Fatal in contact with skin.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H340 May cause genetic defects.

H350 May cause cancer.

H372 Causes damage to the central nervous system and the hematopoietic system through prolonged or repeated exposure.

H304 May be fatal if swallowed and enters airways.

- **Precautionary statements**

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 If swallowed: Immediately call a poison center/doctor.

P321 Specific treatment (see on this label).

P331 Do NOT induce vomiting.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313 IF exposed or concerned: Get medical advice/attention.

(Contd. on page 3)

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 2)

P314	Get medical advice/attention if you feel unwell.
P330	Rinse mouth.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use CO ₂ , powder or water spray to extinguish.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Classification system:**

- **NFPA ratings (scale 0 - 4)**



Health = 3
Fire = 3
Reactivity = 0

- **HMIS-ratings (scale 0 - 4)**



Health = *3
Fire = 3
Reactivity = 0

- **Other hazards**

- **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.
- **vPvB:** Not applicable.

3 Composition/information on ingredients

- **Chemical characterization: Mixtures**

- **Description:** Mixture of the substances listed below with nonhazardous additions.

- **Dangerous components:**

CAS: 71-43-2	Benzene	99.9%
RTECS: CY1400000		

- **Other ingredients**

148185-52-8	PBD-BODIPY	0.1%
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4 First-aid measures

- **Description of first aid measures**

- **General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

In case of irregular breathing or respiratory arrest provide artificial respiration.

- **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.

- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

- **After eye contact:**

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

- **After swallowing:** Immediately call a doctor.

(Contd. on page 4)

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 3)

- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture**
67-56-1 During heating or in case of fire poisonous gases are produced.
- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

· PAC-1:		
71-43-2	Benzene	52 ppm
· PAC-2:		
71-43-2	Benzene	800 ppm
· PAC-3:		
71-43-2	Benzene	4000* ppm

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

(Contd. on page 5)

-US

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 4)

Keep respiratory protective device available.

- **Conditions for safe storage, including any incompatibilities**
- **Storage:** Store in accordance with information listed on the product insert.
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**

· Components with limit values that require monitoring at the workplace:

71-43-2 Benzene

PEL	Short-term value: 15* mg/m ³ , 5* ppm Long-term value: 3* mg/m ³ , 1* ppm *table Z-2 for exclusions in 29CFR1910.1028(d)
REL	Short-term value: 1 ppm Long-term value: 0.1 ppm See Pocket Guide App. A
TLV	Short-term value: (2.5) NIC-0.1 ppm Long-term value: (0.5) NIC-0.02 ppm Skin; BEI, A1

· Ingredients with biological limit values:

71-43-2 Benzene

BEI	25 µg/g creatinine Medium: urine Time: end of shift Parameter: S-Phenylmercapturic acid (background)
	500 µg/g creatinine Medium: urine Time: end of shift Parameter: t,t-Muconic acid (background)

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
- **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

(Contd. on page 6)

US

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 5)

- **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

- **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form:	Liquid
Color:	Colorless
Odor:	Aromatic
Structural Formula	C ₂₁ H ₁₉ BF ₂ N ₂
Molecular Weight	348.2 g/mol
Odor threshold:	Not determined.
Formulation	A solution in benzene

- **pH-value:** Not determined.

- **Change in condition**

Melting point/Melting range:	6 °C (42.8 °F)
Boiling point/Boiling range:	80 °C (176 °F)

- **Flash point:** -11 °C (12.2 °F)

- **Flammability (solid, gaseous):** Highly flammable.

- **Ignition temperature:** 555 °C (1,031 °F)

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product is not explosive. However, formation of explosive air/ vapor mixtures are possible.

(Contd. on page 7)

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 6)

· Explosion limits:	
Lower:	1.2 Vol %
Upper:	8 Vol %
· Vapor pressure at 20 °C (68 °F):	100 hPa (75 mm Hg)
· Density at 20 °C (68 °F):	0.88 g/cm ³ (7.3436 lbs/gal)
· Relative density	Not determined.
· Vapor density	Not determined.
· Evaporation rate	Not determined.
· Solubility in / Miscibility with Water at 20 °C (68 °F):	0.7 g/l
· Partition coefficient (n-octanol/water):	Not determined.
· Viscosity:	
Dynamic at 20 °C (68 °F):	0.66 mPas
Kinematic:	Not determined.
SOLUBILITY	Benzene: 1 mg/ml
· Solvent content:	
Organic solvents:	99.9 %
VOC content:	99.90 %
	999.0 g/l / 8.34 lb/gal
Solids content:	0.0 %
· Other information	No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** strong oxidizing agents, bases, acids
- **Hazardous decomposition products:** carbon monoxide, carbon dioxide

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Dermal	LD50	48 mg/kg (mouse)
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71-43-2 Benzene

Oral	LDLO	50 mg/kg (man)
	LD50	930 mg/kg (rat)
Dermal	LD50	48 mg/kg (mouse)

(Contd. on page 8)

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 7)

Inhalative	LCL0	2 pph/5M (hmn)
	LC50/4 h	9,980 mg/l (mouse)
	Intraperitoneal LD50	1,100 µg/kg (rat)
	Intraperitoneal LD50	340 mg/kg (mouse)
	Subcutaneous LDLO	5 mg/kg (rat)

- **Primary irritant effect:**

- **on the skin:** Irritant to skin and mucous membranes.

- **on the eye:** Irritating effect.

- **Sensitization:** No sensitizing effects known.

- **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:

Harmful

Irritant

Very toxic

Danger through skin absorption.

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

71-43-2	Benzene	1
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- **NTP (National Toxicology Program)**

71-43-2	Benzene	K
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- **OSHA-Ca (Occupational Safety & Health Administration)**

71-43-2	Benzene	
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12 Ecological information

- **Toxicity**

- **Aquatic toxicity:** No further relevant information available.

- **Persistence and degradability** No further relevant information available.

- **Behavior in environmental systems:**

- **Bioaccumulative potential** No further relevant information available.

- **Mobility in soil** No further relevant information available.

- **Additional ecological information:**

- **General notes:**

Water hazard class 3 (Self-assessment): extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

- **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.

- **vPvB:** Not applicable.

- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**

- **Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

(Contd. on page 9)

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023



Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 8)

- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

<ul style="list-style-type: none"> · UN-Number · DOT, IMDG, IATA 	UN1114
<ul style="list-style-type: none"> · UN proper shipping name · DOT, IATA · IMDG 	Benzene solution BENZENE solution
<ul style="list-style-type: none"> · Transport hazard class(es) · DOT 	<div style="text-align: center;">  <p>3</p> </div>
<ul style="list-style-type: none"> · Class · Label 	3 Flammable liquids 3
<ul style="list-style-type: none"> · IMDG, IATA 	<div style="text-align: center;">  <p>3</p> </div>
<ul style="list-style-type: none"> · Class · Label 	3 Flammable liquids 3
<ul style="list-style-type: none"> · Packing group · DOT, IMDG, IATA 	II
<ul style="list-style-type: none"> · Environmental hazards: 	Not applicable.
<ul style="list-style-type: none"> · Special precautions for user · Hazard identification number (Kemler code): · EMS Number: · Stowage Category · Stowage Code 	Warning: Flammable liquids 33 F-E,S-D B SW2 Clear of living quarters.
<ul style="list-style-type: none"> · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code 	Not applicable.
<ul style="list-style-type: none"> · Transport/Additional information: · DOT · Quantity limitations 	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
<ul style="list-style-type: none"> · IMDG · Limited quantities (LQ) · Excepted quantities (EQ) 	1L Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml

(Contd. on page 10)

US

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 9)

- | | |
|--|--|
| <ul style="list-style-type: none"> · IATA · Remarks: | <p>When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.</p> |
| <ul style="list-style-type: none"> · UN "Model Regulation": | <p>UN 1114 BENZENE SOLUTION, 3, II</p> |

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**

- **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

- **Section 313 (Specific toxic chemical listings):**

71-43-2	Benzene
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- **TSCA (Toxic Substances Control Act):**

71-43-2	Benzene	ACTIVE
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- **Hazardous Air Pollutants**

71-43-2	Benzene
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- **Proposition 65**

- **Chemicals known to cause cancer:**

71-43-2	Benzene
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- **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

- **Chemicals known to cause reproductive toxicity for males:**

71-43-2	Benzene
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- **Chemicals known to cause developmental toxicity:**

71-43-2	Benzene
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- **Carcinogenic categories**

- **EPA (Environmental Protection Agency)**

71-43-2	Benzene	A, K/L
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- **TLV (Threshold Limit Value)**

71-43-2	Benzene	A1
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- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

71-43-2	Benzene
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- **National regulations:**

- **Information about limitation of use:**

Workers are not allowed to be exposed to the hazardous carcinogenic materials contained in this preparation. Exceptions can be made by the authorities in certain cases.

(Contd. on page 11)

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/16/2023

Revision date 01/16/2023

Trade name: PBD-BODIPY

(Contd. from page 10)

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- **Department issuing SDS:** Environment protection department.

- **Contact:** -

- **Date of preparation / last revision** 01/16/2023

- **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flammable Liquids 2: Flammable liquids – Category 2

Acute Toxicity - Oral 4: Acute toxicity – Category 4

Acute Toxicity - Dermal 1: Acute toxicity – Category 1

Skin Irritation 2: Skin corrosion/irritation – Category 2

Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A

Germ Cell Mutagenicity 1A: Germ cell mutagenicity – Category 1A

Carcinogenicity 1A: Carcinogenicity – Category 1A

Specific Target Organ Toxicity - Repeated Exposure 1: Specific target organ toxicity (repeated exposure) – Category 1

Aspiration Hazard 1: Aspiration hazard – Category 1

- *** Data compared to the previous version altered.**