

SAFETY DATA SHEET

Date: February 7, 2024

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Paraformaldehyde, 4% in PBS Ready-to Use Fixative
Catalog Number: 22023
Unit Size: 20 mL
Manufacturer/Supplier: Biotium, Inc.
46117 Landing Parkway, Fremont, CA 94538, USA
Phone: 1-510-265-1027, Fax: 1-510-265-1352
Web: <http://www.biotium.com>

Use as laboratory reagent. For research use only. Not for food, drug, household, or cosmetic use.

2. HAZARDS IDENTIFICATION

GHS classification**Signal word** Danger**Health hazards**

Carc. 1B

Muta. 2

Acute Tox. 3

Skin Corr. 1B

Skin Sens. 1

Physical hazards None**Hazard statements**

H301: Toxic if swallowed

H311: Toxic in contact with skin

H314: Causes severe skin burns and eye damage

H317: May cause an allergic skin reaction

H331: Toxic if inhaled

H341: Suspected of causing genetic defects

H350: May cause cancer

Precautionary statements

P201: Obtain special instructions before use.

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

P203: Obtain, read and follow all safety instructions before use.

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

P261: Avoid breathing dust/fume/gas/mist/vapors/spray.

P264: Wash hands thoroughly after handling.

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

P271: Use only outdoors or in a well-ventilated area.

P272: Contaminated work clothing should not be allowed out of the workplace.

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

P281: Use personal protective equipment as required.

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P301+P316: IF SWALLOWED: Get emergency medical help immediately.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302+P352: IF ON SKIN: wash with plenty of soap and water

P302+P361+P354: IF ON SKIN: Take off Immediately all contaminated clothing. Immediately rinse with water for several minutes.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.

P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+ P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P305+P354+P338: IF IN EYES: Immediately rinse 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.
P310: Immediately call a POISON CENTER or doctor/physician.
P311: Call a POISON CENTER or doctor/physician (Toxic if inhaled).
P312: Call a POISON CENTER or doctor/physician if you feel unwell.
P316: Get emergency medical help immediately.
P318: If exposed or concerned, get medical advice.
P321: Specific treatment on label (Toxic if swallowed, May cause an allergic skin reaction, Toxic if inhaled).
P322: Specific treatment on label (Toxic in contact with skin).
P330: Rinse mouth.
P333+P313: IF SKIN irritation or rash occurs: Get medical advice/attention.
P361: Remove/Take off immediately all contaminated clothing.
P363: Wash contaminated clothing before reuse.
P361+P364: Take off immediately all contaminated clothing and wash it before reuse.
P362+P364: Take off contaminated clothing and wash it before reuse.
P363: Wash contaminated clothing before reuse.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P501: Dispose of content and container in accordance with all local, regional, national and international regulations.

GHS hazard pictogram**WHMIS classification****Signal word** Danger**Health hazards**

Flammable gases: 1

Acute toxicity (inhalation): 2

Serious eye damage/eye irritation: 2

Germ cell mutagenicity: 2

Carcinogenicity: 1A

Specific target organ toxicity - single exposure (respiratory tract irritation): 3

Hazard statements

H220: Extremely flammable gas

H330: Fatal if inhaled

H319: Causes serious eye irritation

H341: Suspected of causing genetic defects

H350: May cause cancer

H335: May cause respiratory irritation

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.

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

P261: Avoid breathing dust/fume/gas/mist/vapors/spray.

P264: Wash hands thoroughly after handling.

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

P271: Use only outdoors or in a well-ventilated area.

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

P281: Use personal protective equipment as required.

P284: Wear respiratory protection.
 P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 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.
 P310: Immediately call a POISON CENTER or doctor/physician.
 P312: Call a POISON CENTER or doctor/physician if you feel unwell.
 P320: Specific treatment is urgent (see ... on this label).
 P337+P313P: IF eye irritation persists: Get medical advice/attention.
 P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 P381: Eliminate all ignition sources if safe to do so.
 P403: Store in a well-ventilated place.
 P403+P233: Store in a well-ventilated place. Keep container tightly closed.
 P405: Store locked up.
 P501: Dispose of content and container in accordance with all local, regional, national and international regulations

WHMIS Hazard pictogram

NFPA Rating

Health hazard: 3
 Fire: 4
 Reactivity Hazard: 0

Classification according to Regulation (EC) No 1272/2008[CLP]

Acute Toxicity: 3
 Skin Corrosion: 1B
 Skin Sensitization: 1
 Germ Cell Mutagenicity: 2
 Carcinogenicity: 1B

Labeling according to Regulation (EC) No 1272/2008[CLP]
Hazard pictogram


Signal word Danger

Hazard statements

H301: Toxic if swallowed.
 H311: Toxic in contact with skin.
 H314: Causes severe skin burns and eye damage.
 H317: May cause an allergic skin reaction.
 H331: Toxic if inhaled.
 H341: Suspected of causing genetic defects.
 H350: May cause cancer.

Precautionary statements

P201: Obtain special instructions before use.
 P202: Do not handle until all safety precautions have been read and understood.
 P203: Obtain, read and follow all safety instructions before use.
 P260: Do not breathe dust/fume/gas/mist/vapors/spray.
 P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
 P264: Wash hands thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.
 P271: Use only outdoors or in a well-ventilated area.
 P272: Contaminated work clothing should not be allowed out of the workplace.
 P280: Wear protective gloves/protective clothing/eye protection/face protection.
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 P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 P301+P316: IF SWALLOWED: Get emergency medical help immediately.
 P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P302+P352: IF ON SKIN: wash with plenty of soap and water
 P302+P361+P354: IF ON SKIN: Take off Immediately all contaminated clothing. Immediately rinse with water for several minutes.
 P303+P361+P353: IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.
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 P405: Store locked up.
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3. COMPOSITION/INFORMATION ON INGREDIENTS

Name	CAS No.	EC No.	Weight %	Classification
Formaldehyde	50-00-0	200-001-8	<5%	Carc. 1B (GHS, EC) Muta. 2 (GHS, EC, WHMIS) Acute Tox. 3 (GHS, EC) Skin Corr. 1B (GHS, EC) Skin Sens. 1 (GHS, EC) Flam. Gas. 1 (WHMIS) Acute Toxicity (inhal.): 2 (WHMIS) Serious eye damage/eye irrit. 2 (WHMIS) Carc. 1A (WHMIS) Specific target organ tox. - single exposure (resp. tract irrit.) 3 (WHMIS)

4. FIRST- AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Carbon dioxide, dry chemical extinguishers, foam extinguishers or water.

Special protective equipment for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid breathing vapors, mist, or gas. Remove all sources of ignition.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up

Contain spillage. Soak up spilled substance with inert absorbent material. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid inhalation of vapor or mist.

Avoid direct contact with substance.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Substance: Formaldehyde

CAS no. 50-00-0

Country	Australia	Austria	Belgium	Canada - Ontario	Canada - Québec	Denmark
Limit value, 8hours	1 ppm 1.2 mg/m ³	0.3 ppm 0.37 mg/m ³	--	--	--	0.3 (1)(2) ppm 0.37 (1)(2) mg/m ³
Limit value, short term	2 ppm 2.5 mg/m ³	0.6 (1) ppm 0.74 (1) mg/m ³	0.3 (1)(2)(3) ppm 0.38 (1)(2)(3) mg/m ³	1 ppm 1.5 (1) ppm	2 (1) ppm 3 (1) mg/m ³	0.3 (1)(2)(3) ppm 0.4 (1)(2)(3) mg/m ³

Country	European Union	Finland	France	Germany (AGS)	Germany (DFG)
Limit value, 8hours	0.3 (1) ppm 0.37 (1) mg/m ³	0.3 ppm 0.37 mg/m ³	0.3 (1) ppm 0.37 (1) mg/m ³	0.3 ppm 0.37 mg/m ³	0.3 ppm 0.37 mg/m ³
Limit value, short term	0.6 (1)(2) ppm 0.74 (1)(2) mg/m ³	0.6 (1) ppm 0.74 (1) mg/m ³	0.6 (1) ppm 0.74 (1) mg/m ³	0.6 (1) ppm 0.74 (1) mg/m ³	0.6 (1) ppm 1 (2) ppm 0.74 (1) mg/m ³ 1.2 (2) mg/m ³

Country	Hungary	Ireland	Israel	Italy	Japan (MHLW)	Japan (JSOH)
Limit value, 8hours	0.6 (1) mg/m ³	0.3 ppm 0.37 mg/m ³	0.2 ppm 0.24 mg/m ³	0.3 (1) ppm 0.5 (1)(2) ppm 0.37 (1) mg/m ³ 0.62 (1)(2) mg/m ³	0.1 ppm	0.1 ppm 0.2 (1) ppm 0.12 mg/m ³ 0.24 (1) mg/m ³
Limit value, short term	0.6 (1)(2) mg/m ³	0.6 (1) ppm 0.738 (1) mg/m ³	0.3 (1) ppm 0.37 (1) mg/m ³	0.6 (1)(3) ppm 0.74 (1)(3) mg/m ³	--	--

Country	Latvia	New Zealand	Norway	People's Republic of China	Poland	Romania
Limit value, 8hours	0.3 (1)(2) ppm 0.37 (1)(2) mg/m ³	0.3 ppm	0.5 ppm 0.6 mg/m ³	--	0.37 mg/m ³	0.3 (1) ppm 0.37 (1) mg/m ³
Limit value, short term	0.6 (1)(3) ppm 0.74 (1)(3) mg/m ³	0.6 (1) ppm	1 (1) ppm 1.2 (1) mg/m ³	0.5 (1) mg/m ³	0.74 (1) mg/m ³	0.6 (1)(3) ppm 0.74 (1)(3) mg/m ³

Country	Singapore	South Africa	South Africa Mining	South Korea	Spain	Sweden
Limit value, 8hours	--	0.2 ppm	1 ppm 1.2 mg/m ³	0.3 ppm	0.3 ppm 0.37 mg/m ³	0.3 ppm 0.37 mg/m ³
Limit value, short term	0.3 ppm 0.37 mg/m ³	0.6 (1) ppm	2 ppm 2.5 mg/m ³	--	0.6 (1) ppm 0.74 (1) mg/m ³	0.6 (1) ppm 0.74 (1) mg/m ³

Country	Switzerland	The Netherlands	USA - NIOSH	USA - OSHA	United Kingdom
Limit value, 8hours	0.3 ppm 0.37 mg/m ³	0.15 mg/m ³	0.016 ppm	0.75 ppm	2 ppm 2.5 mg/m ³
Limit value, short term	0.6 (1) ppm 0.74 (1) mg/m ³	0.5 (1) mg/m ³	0.1 ppm	2 (1) ppm	2 ppm 2.5 mg/m ³

Austria (1) Ceiling limit value

Belgium (1) Additional indication "C" means that the agent falls within the scope of Title 2 concerning carcinogenic, mutagenic and reprotoxic agents of Book VI of the Codex on well-being at work. (2) Additional indication "M" means that irritation occurs when the exposure exceeds the limit value or there is a risk of acute poisoning. The work process must be designed in such a way that the exposure never exceeds the limit value. For evaluation, the sampled period should be as short as possible. However, the sampled period shall be long enough to perform a reliable measurement. The measured result shall be related to the considered period. (3) 15 minutes average value

Canada - Ontario (1) Ceiling limit value

Canada - Québec (1) Ceiling limit value

Denmark (1) Skin (2) Carcinogenic (3) Ceiling limit value

European Union (1) Limit value of 0,62 mg/m³ or 0,5 ppm for the health care, funeral and embalming sectors until 11 July 2024 (2) 15 minute as average value Bold-type: Binding Occupational Exposure Limit Value (BOELV) ~ (for references see [bibliography](#))

Finland (1) 15 minutes average value

France Bold type: Restrictive statutory limit values (1) LV (8h) of 0.62 mg/m³ or 0.5 ppm for the healthcare, funeral and embalming sectors until July 11, 2024. (2) 15 minutes average value

Germany (AGS) (1) 15 minutes average value

Germany (DFG) (1) 15 minutes average value (2) Ceiling limit value

Hungary (1) Skin (2) 15 minutes average value

Ireland (1) 15 minutes average value

Israel (1) Ceiling limit value

Italy (1) The substance can cause sensitisation of the skin (2) Limit value for the health care, funeral and embalming sectors until 11 July 2024 (3) 15 minutes average value

Japan (JSOH) (1) Occupational exposure limit ceiling: Reference value to the maximal exposure concentration of the substance during a working day
 Latvia (1) Skin (2) Until 11 July 2024, for formaldehyde in the fields of health care, funeral, and embalming - 0.62 mg/m³ or 0.5 ppm; (3) 15 minutes average value
 New Zealand (1) 15 minutes average value
 Norway (1) Ceiling limit value
 People's Republic of China (1) Ceiling limit value
 Poland (1) 15 minutes average value
 Romania (1) Limit value of 0,62 mg/m³ or 0,5 ppm for the health care, funeral and embalming sectors until 11 July 2024
 (2) 15 minutes average value
 South Africa (1) 15 minutes average value
 South Africa Mining (1) 15 minutes average value
 Spain (1) 15 minutes average value
 Sweden (1) 15 minutes average value
 The Netherlands (1) 15 minutes average value
 USA - NIOSH (1) Ceiling limit value (15 min)
 USA - OSHA (1) 15 minutes average value

Personal protective equipment

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Respiratory protection

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Eye protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Name	Paraformaldehyde, 4% in PBS
Appearance	Liquid
Odor	No data available
Odor threshold	No data available
pH	6.9-7.5
Melting point/freezing point	No data available
Boiling point	No data available
Flash point	No data available
Evaporate rate	No data available
Flammability	No data available
Explosive limits	No data available
Vapor pressure	No data available
Vapor density	No data available
Relative density	No data available
Solubility	Soluble
Partition coefficient:n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

No data available

Conditions to avoid

Heat, flames and sparks.

Materials to avoid

No data available

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

11. TOXICOLOGICAL INFORMATION**Acute toxicity**

Oral LD50 Rat - 100 mg/kg

Inhalation LC50 Rat - male and female - 4 h - < 0.57 mg/l

Dermal LD50 Rabbit - 270 mg/kg

Other information on acute toxicity No data available

Skin corrosion/irritation No data available

Serious eye damage/eye irritation No data available

Respiratory or skin sensitization No data available

Germ cell mutagenicity No data available

Carcinogenicity

Possible carcinogen

IARC: 1 - Group 1: Carcinogenic to humans (Formaldehyde)

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity No data available

Specific target organ toxicity - single exposure (Globally Harmonized System)

No data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)

No data available

Aspiration hazard

No data available

Potential health effects

Inhalation May be harmful if inhaled. May cause respiratory tract irritation.

Ingestion May be harmful if swallowed.

Skin May be harmful if absorbed through skin. May cause skin irritation.

Eyes May cause eye irritation.

Additional Information

Burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Handle in accordance with good industrial hygiene and safety practice.

Liver - Irregularities - Based on Human Evidence

RTECS: LP8925000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish static test LC50 - Morone saxatilis - 6.7 mg/l - 96 h Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates static test EC50 - Daphnia pulex (Water flea) - 5.8 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae static test EC50 - Desmodesmus subspicatus (green algae) - 4.89 mg/l - 72 h (OECD Test Guideline 201) Toxicity to bacteria static test EC50 - activated sludge - 19 mg/l - 3 h (OECD Test Guideline 209)

Toxicity to bacteria static test EC50 - activated sludge - 19 mg/l - 3 h (OECD Test Guideline 209)

Persistence and degradability No information available

Bioaccumulative potential No information available

Mobility in soil No information available

Results of PBT and vPvB assessment No information available

Other adverse effects No information available

Additional information

13. DISPOSAL CONSIDERATIONS

Do not dispose product directly into sewage. Consult local, state, or national regulation for proper disposal.

14. TRANSPORT INFORMATION

IATA, IMDG, DOT (US), TDG	Not dangerous goods during transportation	
UN number	None	
UN proper shipping name	None	
Transport hazard class	None	
Packing group	None	
Environmental hazards	None	
Transport in bulk according to Annex II of MARPOL 73/78 and IBC Code	None	
Special precaution for user	None	

15. REGULATION INFORMATION

US Federal Regulations

US Toxic Substances Control Act (TSCA): Formaldehyde	CAS-No.	50-00-0
	Revision Date	2023-02-01

SARA 302:	Formaldehyde	CAS-No.	50-00-0
		Revision Date	2007-07-01

SARA 313:	Formaldehyde	CAS-No.	50-00-0
		Revision Date	2007-07-01

SARA 311/312: No chemicals were found

WHMIS Hazard Class

Flammable gases: 1
 Acute toxicity (inhalation): 2
 Serious eye damage/eye irritation: 2
 Germ cell mutagenicity: 2
 Carcinogenicity: 1A
 Specific target organ toxicity - single exposure (respiratory tract irritation): 3

16. OTHER INFORMATION

Classification according to Regulation (EC) Nr. 1272/2008
Refer to section 2 and section 3

Prepared by: Regulatory Department
Biotium Inc.
Version no. 5
Revision date (Initials) 2/7/2024 (JD)
Reason for revision Update to new document template.

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