

**Material Safety Data Sheet**  
**Version No.: 4.0(Revision Date: 2026-03-20)**

# Master mix

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## 1. PRODUCT AND COMPANY IDENTIFICATION

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A. Product name : Master mix

B. Recommended use : Research use only

C. Supplier

Company name : Bioneer corporation

Address : 71, Techno 2-ro, Yuseong-gu, Daejeon, Republic of Korea

Telephone : +82-42-1588-9788

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## 2. HAZARDS IDENTIFICATION

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A. Emergency Overview

Not applicable

B. GHS Label elements, including precautionary statements

Pictogram

Not applicable

Signal word : Not applicable

Hazard statements(s) :

Not applicable

Precautionary statements :

Prevention :

Not applicable

Response :

Not applicable

Storage :

Not applicable

Disposal :

Not applicable

C. Other hazards which do not result in classification (Example: dust explosion hazard) : No data available

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name                                       | CAS Number | Weight per volume percent [% (w/v)] |
|---|------------|-------------------------------------|
| 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | 7365-45-9  | 5 ~ 10%                             |
| Trade secret  | -          | Trade secret                        |

### 4. FIRST AID MEASURES

A. In case of eye contact :

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.

Get immediate medical advice/attention.

B. In case of skin contact :

IF ON SKIN (or hair): Take off Immediately all contaminated clothing. Rinse SKIN with water [or shower].

Get immediate medical advice/attention.

C. If Inhaled :

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

Get immediate medical advice/attention.

D. If swallowed :

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Get immediate medical advice/attention.

E. Notes to physician :

Notify medical personnel of contaminated situations and have them take appropriate protective measures.

### 5. FIRE-FIGHTING MEASURES

A. Suitable (or unsuitable) extinguishing media :

Suitable extinguishing media: Water, Foam, Carbon dioxide (CO<sub>2</sub>), Dry powder.

Unsuitable extinguishing media: For this mixture no limitations of extinguishing agents are given.

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B. Specific hazards arising from the chemical (Example: Hazardous substances generated during combustion) :

Material may produce irritating and highly toxic gases from decomposition by heat and combustion during burning.

When heated, vapors may form explosive mixtures with air: explosion hazards indoors, outdoors and in sewers

C. Special protective actions for firefighters :

Rescuers should put on appropriate protective gear.

Evacuate area and fight fire from a safe distance.

Move containers from fire area if you can do it without risk.

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## 6. ACCIDENTAL RELEASE MEASURES

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A. Personal precautions, protective equipment :

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

Clean up spills immediately, observing precautions in '8. EXPOSURE CONTROLS/PERSONAL PROTECTION' section.

Isolate hazard area.

Keep unnecessary and unprotected personnel from entering.

Eliminate all ignition sources.

Stop leak if you can do it without risk.

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

B. Environmental precautions :

Runoff from fire control may be corrosive and/or toxic and cause pollution.

Prevent entry into water ways, sewers, basements or confined areas.

C. The methods of purification and removal :

Absorb spills with inert material (e.g., dry sand or earth), then place in a chemical waste container.

Reduce dust and prevent scattering by moistening with water.

Dissolve in water and collect for proper disposal.

Absorb the liquid and scrub the area with detergent and water.

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## 7. HANDLING AND STORAGE

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A. Precautions for safe handling :

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

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

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Use carefully in handling/storage.

Use only outdoors or in a well-ventilated area.

Loosen closure cautiously before opening.

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

Wash your hands thoroughly after handling.

Avoid prolonged or repeated contact with skin.

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

Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

B. Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated place. Keep container tightly closed.

Do not apply any physical shock to container.

Avoid direct sunlight.

Keep in the original container.

Please pay attention to incompatibilities materials and conditions to avoid.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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A. Occupational Exposure Limits :

No data available

B. Appropriate engineering controls :

No data available

C. Personal Protective Equipment :

Respiratory protection :

No data available

Eye protection :

Wear the protective glasses or breathable safety goggles to protect from particles causing eye irritation or other disorder.

An eye wash unit and safety shower station should be available nearby work place.

Hand protection :

Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Skin and body protection :

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Wear appropriate resistant protective clothing by considering physical and chemical properties of chemicals.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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- A. Appearance (form, color, etc) : No data available
- B. Odor : No data available
- C. Odor Threshold : No data available
- D. pH : No data available
- E. Melting/Freezing point : No data available
- F. Initial boiling point/range : No data available
- G. Flash point : No data available
- H. Evaporation rate : No data available
- I. Flammability (solid, gas) : No data available
- J. Lower/upper explosion limit : No data available
- K. Vapor pressure : No data available
- L. Water solubility : No data available
- M. Relative vapor density : No data available
- N. Density : No data available
- O. Partition coefficient: n-octanol/water : No data available
- P. Autoignition temperature : No data available
- Q. Decomposition temperature : No data available
- R. Viscosity : No data available
- S. Molecular weight : No data available

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## 10. STABILITY AND REACTIVITY

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- A. Chemical stability/Possibility of hazardous reactions :  
No data available
  - B. Conditions to avoid :  
No data available
-

C. Incompatible materials :

No data available

D. Hazardous decomposition products :

No data available

## 11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

| Category                  | Chemical name   | Content           |
|---------------------------|---|-------------------|
| Likely routes of exposure | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | No data available |
|                           | Trade secret  | No data available |

B. Delayed and immediate effects and also chronic effects from short and long term exposure

| Category                       | Chemical name   | Content  |
|--------------------------------|---|--|
| Acute toxicity<br>(Oral)       | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | LD50 Oral – Rat – male and female – > 2,000 mg/kg  |
|                                | Trade secret  | LD50 Oral – Rat – male and female – > 2,000 mg/kg  |
| Acute toxicity<br>(Dermal)     | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | LD50 Dermal – Rat – male and female – > 2,000 mg/kg  |
|                                | Trade secret  | LD50 Dermal – Rat – male and female – > 2,000 mg/kg<br>LD50 Dermal – Rabbit – female -> 20,000 mg/kg |
| Acute toxicity<br>(Inhalation) | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | No data available  |
|                                | Trade secret  | No data available  |
| Skin                           | 4-(2-Hydroxyethyl)-   | No data available  |

|  |   |                   |
|--|---|-------------------|
| corrosion/irritation                               | piperazine-1-ethanesulfonic acid                    |                   |
|  | Trade secret  | No data available |
| Serious eye damage/eye irritation                  | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |
|  | Trade secret  | No data available |
| Respiratory or skin sensitization                  | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |
|  | Trade secret  | No data available |
| Germ cell mutagenicity                             | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |
|  | Trade secret  | No data available |
| Carcinogenicity                                    | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |
|  | Trade secret  | No data available |
| Reproductive toxicity                              | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |
|  | Trade secret  | No data available |
| Specific target organ toxicity – single exposure   | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |
|  | Trade secret  | No data available |
| Specific target organ toxicity – repeated exposure | 4-(2-Hydroxyethyl)-piperazine-1-ethanesulfonic acid | No data available |

|                   |   |                   |
|-------------------|---|-------------------|
|                   | Trade secret  | No data available |
| Aspiration hazard | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | No data available |
|                   | Trade secret  | No data available |

C. Numerical measures of toxicity (Example: Acute toxicity estimate)

| Category                             | Chemical name | Content        |
|--------------------------------------|---------------|----------------|
| Acute toxicity estimate (Oral)       | Master mix    | > 10,000 mg/kg |
| Acute toxicity estimate (Dermal)     | Master mix    | > 27,000 mg/kg |
| Acute toxicity estimate (Inhalation) | Master mix    | > 800 mg/kg    |

**12. ECOLOGICAL INFORMATION**

| Category                | Chemical name   | Content  |
|-------------------------|---|--|
| Ecotoxicity (Fish)      | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | LC50 – Danio rerio (zebra fish) – > 100 mg/l – 96 h<br>(OECD Test Guideline 203)   |
|                         | Trade secret  | LC50 – Poecilia reticulata (guppy) –> 100 mg/l – 96 h<br>(OECD Test Guideline 203) |
| Ecotoxicity (Crustacea) | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | EC50 – Daphnia magna (Water flea) – > 100 mg/l – 48 h<br>(OECD Test Guideline 202) |
|                         | Trade secret  | EC50 – Daphnia magna – >100 mg/l – 48 h  |

|                                  |   |   |
|----------------------------------|---|---|
|                                  |   | (OECD Test Guideline 202)   |
| Ecotoxicity (Algae)              | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | ErC50 – Pseudokirchneriella subcapitata (green algae) – ><br>100 mg/l – 72 h<br>(OECD Test Guideline 201) |
|                                  | Trade secret  | EC50 – Other – >100 mg/l – 96 h<br>(OECD Test Guideline 201)  |
| Persistence and<br>degradability | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | aerobic – Exposure time 28 d<br>Result: 0 % – Not readily biodegradable.<br>(OECD Test Guideline 301D)    |
|                                  | Trade secret  | No data available   |
| Bioaccumulative<br>potential     | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | Partition coefficient n-octanol/water (Log Pow)<br>–4.07 Source: National Library of Medicine             |
|                                  | Trade secret  | Partition coefficient n-octanol/water (Log Pow): –2.07  |
| Mobility in soil                 | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | 0.01354 Source: EPI Suite   |
|                                  | Trade secret  | No data available   |
| Other adverse<br>effects         | 4-(2-Hydroxyethyl)-<br>piperazine-1-<br>ethanesulfonic acid | No data available   |
|                                  | Trade secret  | No data available   |

### 13. DISPOSAL CONSIDERATIONS

A. Disposal methods :

Waste material must be disposed of in accordance with the national and local regulations.

B. Special precautions for disposal :

The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle

and dispose, person who establish and operate waste disposal facilities.

## 14. TRANSPORT INFORMATION

| UN RTDG                                  | ADR            | IMDG           | IATA           |
|--|----------------|----------------|----------------|
| A. UN number                             |                |                |                |
| Not applicable                           | Not applicable | Not applicable | Not applicable |
| B. UN proper shipping name               |                |                |                |
| Not applicable                           | Not applicable | Not applicable | Not applicable |
| C. Transport hazard class(es)            |                |                |                |
| Not applicable                           | Not applicable | Not applicable | Not applicable |
| Not applicable                           | Not applicable | Not applicable | Not applicable |
| D. Packing group                         |                |                |                |
| Not applicable                           | Not applicable | Not applicable | Not applicable |
| E. Marine pollutant                      |                |                |                |
| Not applicable                           | Not applicable | Not applicable | Not applicable |
| – No supplementary information available |                |                |                |

F. Special precautions for user:

in case of fire : **Not applicable**

in case of leakage : **Not applicable**

## 15. REGULATORY INFORMATION

A. Occupational Safety and Health Act

| Category  | Applicable or Not Applicable | Detail information |
|---|------------------------------|--------------------|
| Hazardous Substances Prohibited for Manufacturing | Not applicable               | –                  |
| Hazardous Substances Requiring Permission         | Not applicable               | –                  |
| Threshold Limit Values Chemicals                  | Not applicable               | –                  |
| Hazardous Substances Below                        | Not applicable               | –                  |

|  |                |   |
|--|----------------|---|
| Permissible Level  |                |   |
| Hazardous Substances Subject to Working Environment Measurement      | Not applicable | – |
| Hazardous Substances Subject to Workers Requiring Health Examination | Not applicable | – |
| Hazardous Substances Subject to Control                              | Not applicable | – |
| Substance Subject to Submission of PSM                               | Not applicable | – |

B. Chemicals Control Act

| Category                                      | Applicable or Not Applicable | Detail information |
|---|------------------------------|--------------------|
| Toxic Substances                              | Not applicable               | –                  |
| Prohibited Substances                         | Not applicable               | –                  |
| Restricted Substances                         | Not applicable               | –                  |
| Substances Requiring Preparation for Accident | Not applicable               | –                  |

C. ACT ON REGISTRATION, EVALUATION, ETC. OF CHEMICALS (K-REACH)

| Category  | Applicable or Not Applicable | Detail information |
|---|------------------------------|--------------------|
| Korea Existing Chemicals Inventory (MOE, Republic of Korea) | Applicable                   | Trade secret       |
| Priority Existing Chemicals (MOE, Republic of Korea)        | Not applicable               | –                  |
| Substances Subject to Intensive Control                     | Not applicable               | –                  |
| CMR Substances  | Not applicable               | –                  |

D. Safety Control of Dangerous Substances Act

| Category                                   | Applicable or Not Applicable | Detail information  |
|--|------------------------------|---|
| Safety Control of Dangerous Substances Act | Applicable                   | Trade secret<br>(Class 4 Flammable liquid – category 6 Fourth class Petroleum Water (Designated quantity: 6,000 liter)) |

E. Wastes Control Act

| Category                                  | Applicable or Not Applicable | Detail information |
|---|------------------------------|--------------------|
| Hazardous Substances in Designated wastes | Not applicable               | –                  |
| Types of wastes                           | No data available            | –                  |

F. Other Domestic and International Regulatory Information

– Domestic

| Category  | Applicable or Not Applicable | Detail information |
|---|------------------------------|--------------------|
| Persistent Organic Pollutants(POPs) Control Act | Not applicable               | –                  |
| Ozone Depleting Substances(ODS)                 | Not applicable               | –                  |

– International

– EU Regulatory Information

| Category                 | Applicable or Not Applicable                           | Detail information |
|--------------------------|--|--------------------|
| EU Candidate list (SVHC) | Contains no substance(s) listed on the REACH Candidate | –                  |

|   | List  |   |
|---|---|---|
| EU authorization list (REACH Annex XIV) | Contains no substance(s) listed on REACH Annex XIV (Authorisation List) |   |
| EU restriction list (REACH Annex XVII)  | Not applicable  | – |

– US Regulatory Information

| Category                        | Applicable or Not Applicable | Detail information |
|---------------------------------|------------------------------|--------------------|
| CERCLA Section 103 (40CFR302.4) | Applicable                   | On the inventory   |
| EPCRA Section 302 (40CFR355.30) | Not applicable               | –                  |
| EPCRA Section 304 (40CFR355.40) | Not applicable               | –                  |
| EPCRA Section 313 (40CFR372.65) | Not applicable               | –                  |

– International agreements

No data available

## 16. OTHER INFORMATION

### A. Key literature reference and sources for data

- 1) Chemical reagent provider's Material Safety Data Sheet. (2. HAZARDS IDENTIFICATION // 4. FIRST AID MEASURES // 5. FIRE-FIGHTING MEASURES // 6. ACCIDENTAL RELEASE MEASURES // 7. HANDLING AND STORAGE // 8. EXPOSURE CONTROLS/PERSONAL PROTECTION // 9. PHYSICAL AND CHEMICAL PROPERTIES // 10. STABILITY AND REACTIVITY // 11. TOXICOLOGICAL INFORMATION // 12. TOXICOLOGICAL INFORMATION)
- 2) Korea Occupational Safety & Health Agency chemical information, <http://msds.kosha.or.kr/MSDSInfo/> (2. HAZARDS IDENTIFICATION // 4. FIRST AID MEASURES // 5. FIRE-FIGHTING MEASURES // 6. ACCIDENTAL RELEASE MEASURES // 7. HANDLING AND STORAGE // 8. EXPOSURE CONTROLS/PERSONAL PROTECTION // 9. PHYSICAL AND CHEMICAL PROPERTIES // 10. STABILITY AND REACTIVITY // 11. TOXICOLOGICAL INFORMATION // 12. TOXICOLOGICAL INFORMATION)
- 3) ExESS Material Safety Data Sheet program's database search. (8. EXPOSURE CONTROLS/PERSONAL PROTECTION // 11. TOXICOLOGICAL INFORMATION // 12. ECOLOGICAL INFORMATION // 14. TRANSPORT

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INFORMATION // 15. REGULATORY INFORMATION)

4. Korea Maritime Dangerous Goods Inspection & Research Institute, <http://eng.komdi.or.kr/> (14. TRANSPORT INFORMATION)

B. Issue date : 26-April-2013

C. Revision number and Last date revised : 4 (20-March-2026)

D. Disclaimer :

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 appropriate safety precautions. It does not represent any guarantee of the properties of the product. BIONEER corporation shall not be held liable for any damage resulting from handling or from contact with the above product.

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