



**Kit Components**

11/07/2012

| Product code   | Description                 |
|----------------|-----------------------------|
| <b>1660005</b> | <b>GFP Purification Kit</b> |
| 1669020EDU     |                             |
| 166005EDU      |                             |

Components:

|         |                               |
|---------|-------------------------------|
| 9702998 | TE Buffer                     |
| 9703002 | Equilibration Buffer          |
| 9703001 | Binding Buffer                |
| 9703003 | Column Wash Buffer            |
| 1660406 | Arabinose Lyophilized         |
| 1660413 | Macro-Prep® Methyl HIC Column |
| 1660415 | Lysozyme Lyophilized          |
| 1660412 | LB Broth, Capsules            |
| 1660407 | Ampicillin, lyophilized       |

|  |  |
|--|--|
|  |  |
|  |  |

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: **TE Buffer**
- Catalog or product number: 9702998
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

(510)741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment:  
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:  
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.
- The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.

**Label elements**

- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GerStoffV).
- Safety phrases:  
60 This material and its container must be disposed of as hazardous waste.
- Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

**3 Composition/information on ingredients**

- Chemical characterization: Substances
- CAS No. Description:  
7732-18-5 water

(Contd. on page 2) USA

Trade name: **TE Buffer**

(Contd. of page 1)

- Identification number(s):
  - EC number: 231-791-2
  - Chemical characterization: Mixtures
  - Description: Mixture of the substances listed below with non-hazardous additions.
  - List of dangerous and non-hazardous components:
- |           |                                 |        |          |
|-----------|---------------------------------|--------|----------|
| 77-86-1   | Tris(hydroxymethyl)aminomethane | Xn R22 | 0.1-1.0% |
| 7732-18-5 | water                           | Xi R36 | 50-100%  |
- Additional information For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- General information No special measures required.
- After inhalation Supply fresh air; consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Rinse opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions: Dilute with plenty of water.
- Methods and material for containment and cleaning up:  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- Reference to other sections
- No dangerous substances are released.
- See Section 7 for information on safe handling
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling No special measures required.

(Contd. on page 3) USA

Trade name: TE Buffer

- Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
- Storage
- Requirements to be met by storerooms and receptacles: According to product specification
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.
- Specific end use(s): No further relevant information available.

(Contd. of page 2)

**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: The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment
- General protective and hygienic measures: The usual precautionary measures for handling chemicals should be followed.
- Breathing equipment: Not required.
- Protection of hands: Protective gloves.
- Material of gloves: Synthetic gloves
- 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: Safety glasses

**9 Physical and chemical properties**

- Information on basic physical and chemical properties
- General information
- Appearance:
- Form: Liquid
- Color: Colorless
- Odor: Odorless
- Odour threshold: Not determined.
- pH-value: Not determined.
- Change in condition
- Melting point/Melting range: 0°C
- Boiling point/Boiling range: undetermined
- Flash point: Not applicable
- Flammability (solid, gaseous): Not applicable.
- Ignition temperature:
- Decomposition temperature: Not determined.
- Auto igniting: Product is not selfigniting.

(Contd. on page 4)  
USA

Trade name: TE Buffer

- Danger of explosion: Product does not present an explosion hazard.
- Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.
- Vapor pressure at 20°C: 23 hPa
- Density at 20°C: 1 g/cm<sup>3</sup>
- Relative density: Not determined.
- Vapour density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with Water: Fully miscible
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - dynamic: Not determined.
  - kinematic: Not determined.
- Solvent content:
  - Organic solvents: 0.0 %
  - Water: 99.8 %
- Solids content: 0.2 %
- Other information: No further relevant information available.

(Contd. of page 3)

**10 Stability and reactivity**

- Reactivity
- 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: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: No irritant effect.
- No irritant effect.
- Irritant effect:
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
  - The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version.

(Contd. on page 5)  
USA

Trade name: TE Buffer

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

- Carcinogenic categories
- IARC (International Agency for Research on Cancer)
- None of the ingredients is listed.
- NTP (National Toxicology Program)
- None of the ingredients is listed.
- Target organs: Not applicable.

(Contd. of page 4)

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: Generally not hazardous for water.
- 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
- Hand over to hazardous waste disposers.
- Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

- UN-Number
- DOT, ADR, ADN, IMDG, IATA
- UN proper shipping name
- DOT, ADR, ADN, IMDG, IATA
- Transport hazard class(es)
- DOT, ADR, ADN, IMDG, IATA
- Class

(Contd. on page 6)

USA

Trade name: TE Buffer

- Packing group
- DOT, ADR, IMDG, IATA
- Environmental hazards:
- Marine pollutant:
- Special precautions for user
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Transport/Additional information:
- Not dangerous according to the above specifications.

(Contd. of page 5)

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
- Section 302/304 (40CFR355.30 / 40CFR355.40):
- None of the ingredients is listed.
- Section 313 (40CFR372.65):
- None of the ingredients is listed.
- TSCA (Toxic Substances Control Act):
- All ingredients are listed.
- Carcinogenic categories
- EPA (Environmental Protection Agency)
- None of the ingredients is listed.
- TLV (Threshold Limit Value established by ACGIH)
- None of the ingredients is listed.
- MAK (German Maximum Workplace Concentration)
- None of the ingredients is listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health)
- None of the ingredients is listed.
- OSHA-Ca (Occupational Safety & Health Administration)
- None of the ingredients is listed.
- National regulations
- Water hazard class: Generally not hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

- This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.
- Department issuing MSDS: Environmental Health and Safety.
- Contact:
- Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 741-1000

(Contd. on page 7)

USA

Printing date 11/07/2012

## BIO-RAD Material Safety Data Sheet

Page 7/7

Reviewed on 09/11/2012

Trade name: TE Buffer

(Contd. of page 6)

Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547, 1(510) 724-7000  
\* Data compared to the previous version altered.

USA

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: Equilibration Buffer
- Catalog or product number: 9703002
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547  
(510)741-1000
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment:  
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:  
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.  
The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.
- Label elements
- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GerStoffV).
- Safety phrases:  
60 This material and its container must be disposed of as hazardous waste.
- 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 non-hazardous additions.

(Contd. on page 2) USA

Trade name: Equilibration Buffer

(Contd. of page 1)

| Listing of dangerous and non-hazardous components: |                           |
|--|---------------------------|
| Ammonium Sulfate                                   | 20-35%                    |
| 77-86-1 Tris(hydroxymethyl)aminomethane            | Xn R22 0-1-1.0%<br>Xi R36 |
| 7732-18-5 water                                    | 50-100%                   |

Additional information For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- General information No special measures required.
- After inhalation Supply fresh air, consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Rinse opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions:  
Dilute with plenty of water.  
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).
- Reference to other sections  
No dangerous substances are released.  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling No special measures required.
- Information about protection against explosions and fires: No special measures required.

(Contd. on page 3) USA

Trade name: Equilibration Buffer

(Contd. of page 2)

- **Conditions for safe storage, including any incompatibilities**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** According to product specification
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **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:**  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment**
- **General protective and hygienic measures:** The usual precautionary measures for handling chemicals should be followed.
- **Breathing equipment:** Not required.
- **Protection of hands:** Protective gloves.
- **Material of gloves:** Synthetic gloves
- **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:** Safety glasses

**9 Physical and chemical properties**

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
- **Form:** Liquid
- **Color:** Colorless
- **Odour:** Odorless
- **Odour threshold:** Not determined.
- **pH-value:** Not determined.
- **Change in condition**
- **Melting point/Melting range:** undetermined
- **Boiling point/Boiling range:** undetermined
- **Flash point:** Not applicable
- **Flammability (solid, gaseous)** Not applicable.
- **Ignition temperature:**
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not selfigniting.

(Contd. on page 4) USA

Trade name: Equilibration Buffer

(Contd. of page 3)

- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:** Not determined.
- **Lower:** Not determined.
- **Upper:** Not determined.
- **Vapor pressure at 20°C:** 23 hPa
- **Density at 20°C:** 1.046 g/cm<sup>3</sup>
- **Relative density** Not determined.
- **Vapour density** Not determined.
- **Evaporation rate** Not determined.
- **Solubility in / Miscibility with Water:** Fully miscible
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:** Not determined.
- **dynamic:** Not determined.
- **Kinematic:** Not determined.
- **Solvent content:** 0.0 %
- **Organic solvents:** 73.4 %
- **Water:** 26.6 %
- **Solids content:** 26.6 %
- **Other information:** No further relevant information available.

**10 Stability and reactivity**

- **Reactivity**
- **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:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known

**11 Toxicological Information**

- **Information on toxicological effects**
- **Acute toxicity:**
- **LD<sub>50</sub> values for hazardous components per OSHA criteria:**
- **Ammonium Sulfate**
- **Oral LD<sub>50</sub> 3000 mg/kg (rat)**
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** No irritant effect.
- **No irritant effect.**
- **Irritant effect:**
- **Sensitization:** No sensitizing effects known.

(Contd. on page 5) USA



Trade name: Equilibration Buffer

(Contd. of page 4)

Additional toxicological information: The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

- Carcinogenic categories
IARC (International Agency for Research on Cancer)
None of the ingredients is listed.
NTP (National Toxicology Program)
None of the ingredients is listed.
Target organs: Not applicable.

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 1 (German Regulation) (Self-assessment): slightly hazardous for water.
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
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
Hand over to hazardous waste disposers.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

- UN-Number
DOT, ADP, ADM, IMDG, IATA
UN proper shipping name
DOT, ADP, ADM, IMDG, IATA

(Contd. on page 6) USA

Trade name: Equilibration Buffer

(Contd. of page 5)

- Transport hazard class(es)
DOT, ADP, ADM, IMDG, IATA
Class
Packing group
DOT, ADP, IMDG, IATA
Environmental hazards:
Marine pollutant:
Special precautions for user
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Transport/Additional information: Not dangerous according to the above specifications.

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
Section 302/304 (40CFR355.30 / 40CFR355.40):
None of the ingredients is listed.
Section 313 (40CFR372.65):
Ammonium Sulfate
TSCA (Toxic Substances Control Act):
All ingredients are listed.
Carcinogenic categories
EPA (Environmental Protection Agency)
None of the ingredients is listed.
TLV (Threshold Limit Value established by ACGIH)
None of the ingredients is listed.
MAK (German Maximum Workplace Concentration)
None of the ingredients is listed.
NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients is listed.
OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed.
National regulations
Water hazard class 1 (Self-assessment): slightly hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

(Contd. on page 7) USA

**BIO-RAD**

**Material Safety Data Sheet**

Page 7/7

Printing date 11/07/2012

Reviewed on 09/11/2012

Trade name: Equilibration Buffer

(Contd. of page 6)

**16 Other Information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

• Department issuing MSDS: Environmental Health and Safety.

• Contact: Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547. 1(510) 741-1000

Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547. 1(510) 724-7000

\* Data compared to the previous version altered.

USA

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: **Binding Buffer**
- Catalog or product number: 9703001
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment:  
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:  
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.
- The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.
- Label elements
- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GefStoffV).
- Safety phrases:  
60 This material and its container must be disposed of as hazardous waste.
- 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 non-hazardous additions.

Trade name: **Binding Buffer**

(Contd. of page 1)

| Listing of dangerous and non-hazardous components: |                                 |                           |
|--|---------------------------------|---------------------------|
| Ammonium Sulfate                                   |                                 |                           |
| 77-86-1  | Tris(hydroxymethyl)aminomethane | Xn R22 0.1-1.0%<br>Xi R36 |
| 7732-18-5  | water                           | 35-50%                    |

Additional information For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- General information No special measures required.
- After inhalation Supply fresh air; consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Rinse opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions:  
Dilute with plenty of water.  
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).
- Reference to other sections  
No dangerous substances are released.  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling No special measures required.
- Information about protection against explosions and fires: No special measures required.

Trade name: Binding Buffer

(Contd. of page 2)

- Conditions for safe storage, including any incompatibilities
- Storage
- Requirements to be met by storerooms and receptacles: According to product specification
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.
- 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: The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment
- General protective and hygienic measures The usual precautionary measures for handling chemicals should be followed.
- Breathing equipment: Not required.
- Protection of hands: Protective gloves
- Material of gloves Synthetic gloves
- 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: Safety glasses

**9 Physical and chemical properties**

|   |                              |
|---|------------------------------|
| · Information on basic physical and chemical properties |                              |
| · General Information                                   |                              |
| · Appearance:   | Liquid                       |
| · Form:   | Colorless                    |
| · Color:  | Colorless                    |
| · Odor:   | Not determined.              |
| · Odour threshold:                                      | Not determined.              |
| · pH-value:   | Not determined.              |
| · Change in condition                                   | undetermined                 |
| · Melting point/Melting range:                          | undetermined                 |
| · Boiling point/Boiling range:                          | undetermined                 |
| · Flash point:  | Not applicable               |
| · Flammability (solid, gaseous)                         | Not applicable.              |
| · Ignition temperature:                                 |                              |
| · Decomposition temperature:                            | Not determined.              |
| · Auto igniting:  | Product is not selfigniting. |

(Contd. on page 4)  
USA

Trade name: Binding Buffer

(Contd. of page 3)

- Danger of explosion: Product does not present an explosion hazard.
- Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.
- Vapor pressure at 20°C: 23 hPa
- Density at 20°C: 1,096 g/cm<sup>3</sup>
- Relative density: Not determined.
- Vapor density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with
  - Water: Fully miscible
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - dynamic: Not determined.
  - kinematic: Not determined.
- Solvent content:
  - Organic solvents: 0.0 %
  - Water: 46.8 %
- Solids content: 53.2 %
- Other information: No further relevant information available.

**10 Stability and reactivity**

- Reactivity
- 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: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
  - LD<sub>50</sub> values for hazardous components per OSHA criteria:
 

|                              |  |
|------------------------------|--|
| Ammonium Sulfate             |  |
| Oral [LD50] 3000 mg/kg (rat) |  |
- Primary irritant effect:
  - on the skin: No irritant effect.
  - No irritant effect.
  - Irritant effect.
- Sensitization: No sensitizing effects known.

(Contd. on page 5)  
USA

Trade name: Binding Buffer

(Contd. of page 4)

**Additional toxicological information:**  
The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version.  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

- Carcinogenic categories
- IARC (International Agency for Research on Cancer)
- None of the ingredients is listed.
- NTP (National Toxicology Program)
- None of the ingredients is listed.
- Target organs: Not applicable.

**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 1 (German Regulation) (Self-assessment): slightly hazardous for water.
- Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- 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
- Hand over to hazardous waste disposers.
- Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- Recommended cleansing agent: Water, if necessary with cleansing agents.

**14 Transport information**

- UN-Number
- DOT, ADN, IMDG, IATA
- UN proper shipping name
- DOT, ADN, IMDG, IATA

(Contd. on page 6) USA

Trade name: Binding Buffer

(Contd. of page 5)

- Transport hazard class(es)
- DOT, ADN, IMDG, IATA
- Class
- Packing group
- DOT, ADN, IMDG, IATA
- Environmental hazards:
- Marine pollutant:
- Special precautions for user
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Transport/Additional information: Not dangerous according to the above specifications.

**15 Regulatory information**

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
- Section 302/304 (40CFR355.30 / 40CFR355.40):
- None of the ingredients is listed.
- Section 313 (40CFR372.65):
- Ammonium Sulfate
- TSCA (Toxic Substances Control Act):
- All ingredients are listed.
- Carcinogenic categories
- EPA (Environmental Protection Agency)
- None of the ingredients is listed.
- TLV (Threshold Limit Value established by ACGIH)
- None of the ingredients is listed.
- MAK (German Maximum Workplace Concentration)
- None of the ingredients is listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health)
- None of the ingredients is listed.
- OSHA-Ca (Occupational Safety & Health Administration)
- None of the ingredients is listed.
- National regulations
- Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

(Contd. on page 7) USA

Printing date 11/07/2012

## **BIO-RAD** Material Safety Data Sheet

Reviewed on 09/11/2012

Page 7/7

Trade name: Binding Buffer

(Contd. of page 6)

### **16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing MSDS: Environmental Health and Safety.
- Contact:  
Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 741-1000

Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 724-7000

USA

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: Column Wash Buffer
- Catalog or product number: 9703003
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547  
(510)741-1000
- Information department:  
Technical services; customer support  
tsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 676/48/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment:  
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:  
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.  
The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.
- Label elements
- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GeStoffV).
- Safety phrases:  
60 This material and its container must be disposed of as hazardous waste.
- 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 non-hazardous additions.

Trade name: Column Wash Buffer

**List of dangerous and non-hazardous components:**

| (Contd. of page 1) |                                 | 10-20%             |
|--------------------|---------------------------------|--------------------|
| Ammonium Sulfate   |                                 |                    |
| 77-86-1            | Tris(hydroxymethyl)aminomethane | Xn R22<br>0.1-1.0% |
| 7732-18-5          | water                           | Xi R36<br>50-100%  |

Additional information For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- General information No special measures required
- After inhalation Supply fresh air; consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Flush opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions:  
Dilute with plenty of water.  
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).
- Reference to other sections
- No dangerous substances are released
- See Section 7 for information on safe handling
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling No special measures required.
- Information about protection against explosions and fires: No special measures required.

Trade name: Column Wash Buffer

(Contd. of page 2)

- Conditions for safe storage, including any incompatibilities
- Storage
- Requirements to be met by storerooms and receptacles: According to product specification
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None
- Specific end use(s): No further relevant information available.

**8 Exposure control/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:  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment
- General protective and hygienic measures: The usual precautionary measures for handling chemicals should be followed.
- Breathing equipment: Not required.
- Protection of hands: Protective gloves.
- Material of gloves: Synthetic gloves
- 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: Safety glasses

**9 Physical and chemical properties**

|   |                              |
|---|------------------------------|
| · Information on basic physical and chemical properties |                              |
| · General Information                                   |                              |
| · Appearance:   | Liquid                       |
| · Form:   | Colorless                    |
| · Odor:   | Odorless                     |
| · Odour threshold:                                      | Not determined.              |
| · pH-value:   | Not determined.              |
| · Change in condition                                   |                              |
| Melting point/Melting range:                            | undetermined                 |
| Boiling point/Boiling range:                            | undetermined                 |
| · Flash point:  | Not applicable               |
| · Flammability (solid, gaseous)                         | Not applicable.              |
| · Ignition temperature:                                 |                              |
| Decomposition temperature:                              | Not determined.              |
| · Auto igniting:  | Product is not selfigniting. |

(Contd. on page 4)  
USA

Trade name: Column Wash Buffer

(Contd. of page 3)

- Danger of explosion: Product does not present an explosion hazard.
- Explosion limits:  
  Lower: Not determined.  
  Upper: Not determined.
- Vapor pressure at 20°C: 23 hPa
- Density at 20°C: 1,029 g/cm<sup>3</sup>
- Relative density: Not determined.
- Vapour density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with  
  Water: Fully miscible
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:  
  dynamic: Not determined.  
  kinematic: Not determined.
- Solvent content:  
  Organic solvents: 0,0 %  
  Water: 82,7 %
- Solids content: 17,3 %
- Other information: No further relevant information available.

**10 Stability and reactivity**

- Reactivity
- 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: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
- LD/L CS0 values for hazardous components per OSHA criteria:

|                             |  |
|-----------------------------|--|
| Ammonium Sulfate            |  |
| Oral LD50: 3000 mg/kg (rat) |  |

- Primary irritant effect:  
  on the skin: No irritant effect.  
  on the eye: No irritant effect.  
  No irritant effect.
- Sensitization: No sensitizing effects known.

(Contd. on page 5)  
USA



Trade name: Column Wash Buffer

(Contd. of page 4)

- **Additional toxicological information:**  
The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version.  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- **Carcinogenic categories**
- **IARC (International Agency for Research on Cancer)**  
None of the ingredients is listed.
- **NTP (National Toxicology Program)**  
None of the ingredients is listed.
- **Target organs:** Not applicable.

**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 1 (German Regulation) (Self-assessment): slightly hazardous for water.  
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **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**  
Hand over to hazardous waste disposers.  
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

**14 Transport information**

- **UN-Number**  
· DOT, ADR, ADN, IMDG, IATA  
Void
- **UN proper shipping name**  
· DOT, ADR, ADN, IMDG, IATA  
Void

(Contd. on page 6) USA

Trade name: Column Wash Buffer

(Contd. of page 5)

- **Transport hazard class(es)**  
· DOT, ADR, ADN, IMDG, IATA  
· Class  
Void
- **Packing group**  
· DOT, ADR, IMDG, IATA  
Void
- **Environmental hazards:**  
· Marine pollutant:  
No
- **Special precautions for user**  
Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**  
Not applicable.
- **Transport/Additional information:**  
Not dangerous according to the above specifications.

**15 Regulatory information**

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)**
- **Section 302/304 (40CFR355.30 / 40CFR355.40):**  
None of the ingredients is listed.
- **Section 313 (40CFR372.69):**  
Ammonium Sulfate
- **TSCA (Toxic Substances Control Act):**  
All ingredients are listed.
- **Carcinogenic categories**
- **EPA (Environmental Protection Agency)**  
None of the ingredients is listed.
- **TLV (Threshold Limit Value established by ACGIH)**  
None of the ingredients is listed.
- **MAK (German Maximum Workplace Concentration)**  
None of the ingredients is listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health)**  
None of the ingredients is listed.
- **OSHA-Ca (Occupational Safety & Health Administration)**  
None of the ingredients is listed.

- **National regulations**
- **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

(Contd. on page 7) USA

**BIO-RAD**

**Material Safety Data Sheet**

Page 7/7

Printing date 11/07/2012

Reviewed on 09/11/2012

Trade name: Column Wash Buffer

(Contd. of page 6)

**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing MSDS: Environmental Health and Safety;

· Contact: Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 741-1000

· Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 724-7000

USA

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: Arabinose Lyophilized
- Catalog or product number: 1660406, 1660406EDU, 9702997
- CAS Number: 10323-20-3
- EC number: 233-708-5
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com  
Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

(510)741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/648/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment: not applicable
- Classification system:  
The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.

Label elements

- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The substance is not subject to classification according to EU lists and other sources of literature known to us.  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GetStoffV).
- Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

**3 Composition/information on ingredients**

- Chemical characterization: Substances
- CAS No. Description:  
10323-20-3 L-arabinose

(Contd. on page 2) USA

Trade name: Arabinose Lyophilized

- Identification number(s):
- EC number: 233-708-5
- Additional information: For the wording of the listed risk phrases refer to section 15.

(Contd. of page 1)

**4 First aid measures**

- Description of first aid measures
- General information No special measures required.
- After inhalation Supply fresh air; consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Rinse opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions: No special measures required.
- Methods and material for containment and cleaning up: Pick up mechanically.
- Reference to other sections
- No dangerous substances are released
- See Section 7 for information on safe handling
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling No special measures required.
- Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
- Storage
- Requirements to be met by storerooms and receptacles: According to product specification
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.

(Contd. on page 3) USA

Trade name: Arabinose Lyophilized

Specific end use(s) No further relevant information available.

(Contd. of page 2)

**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: Not required.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment
- General protective and hygienic measures The usual precautionary measures for handling chemicals should be followed.
- Protection of hands: Protective gloves.
- Material of gloves: Synthetic gloves
- 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: Safety glasses

**9 Physical and chemical properties**

Information on basic physical and chemical properties  
General Information

|                               |   |
|-------------------------------|---|
| Appearance:                   | Solid<br>Whitish                              |
| Form:                         | Whitish                                       |
| Color:                        | Odorless                                      |
| Odor:                         | Odor determined.                              |
| Odour threshold:              | Not applicable.                               |
| pH-value:                     | Not applicable.                               |
| Change in condition           |   |
| Melting point/Melting range:  | 158°C   |
| Boiling point/Boiling range:  | undetermined                                  |
| Flash point:                  | Not applicable                                |
| Flammability (solid, gaseous) | Product is not flammable.                     |
| Ignition temperature:         |   |
| Decomposition temperature:    | Not determined.                               |
| Auto igniting:                | Not determined.                               |
| Danger of explosion:          | Product does not present an explosion hazard. |
| Explosion limits:             |   |
| Lower:                        | Not determined.                               |
| Upper:                        | Not determined.                               |
| Vapor pressure:               | Not applicable.                               |
| Density at 20°C:              | 0.35 g/cm <sup>3</sup>                        |
| Relative density              | Not determined.                               |
| Vapour density                | Not applicable.                               |

(Contd. on page 4)

USA

Trade name: Arabinose Lyophilized

(Contd. of page 3)

|  |  |
|--|--|
| Evaporation rate                         | Not applicable.                            |
| Solubility in / Miscibility with Water:  | Fully miscible                             |
| Partition coefficient (n-octanol/water): | Not determined.                            |
| Viscosity:                               |  |
| dynamic:                                 | Not applicable.                            |
| kinematic:                               | Not applicable.                            |
| Organic solvents:                        | 0.0 %                                      |
| Solids content:                          | 100.0 %                                    |
| Other information                        | No further relevant information available. |

**10 Stability and reactivity**

- Reactivity
- 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: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect:
- on the skin: No irritant effect.
- on the eye: No irritant effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
- When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- The substance is not subject to classification according to the latest version of the EU lists.
- Carcinogenic categories
- IARC (International Agency for Research on Cancer)
- Substance is not listed.
- NTP (National Toxicology Program)
- Substance is not listed.
- Target organs: Not applicable.

**12 Ecological information**

- Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.

(Contd. on page 5)

USA

Trade name: Arabinose Lyophilized

(Contd. of page 4)

- Behavior in environmental systems:
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- Additional ecological information:
- General notes: Generally not hazardous for water.
- 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: Hand over to hazardous waste disposers. Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- Recommended cleansing agent: Water, if necessary with cleansing agents.

**14 Transport information**

|  |  |
|--|--|
| • UN-Number  | Void   |
| • DOT, ADR, ADN, IMDG, IATA  | Void   |
| • UN proper shipping name  | Void   |
| • DOT, ADR, ADN, IMDG, IATA  | Void   |
| • Transport hazard class(es)   | Void   |
| • DOT, ADR, ADN, IMDG, IATA  | Void   |
| • Class  | Void   |
| • Packing group  | Void   |
| • DOT, ADR, IMDG, IATA   | Void   |
| • Environmental hazards:   | No   |
| • Marine pollutant:  | Not applicable.                                      |
| • Special precautions for user   | Not applicable.                                      |
| • Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not applicable.                                      |
| • Transport/Additional information:  | Not dangerous according to the above specifications. |

(Contd. on page 6)

USA

Trade name: Arabinose Lyophilized

(Contd. of page 5)

**15 Regulatory information**

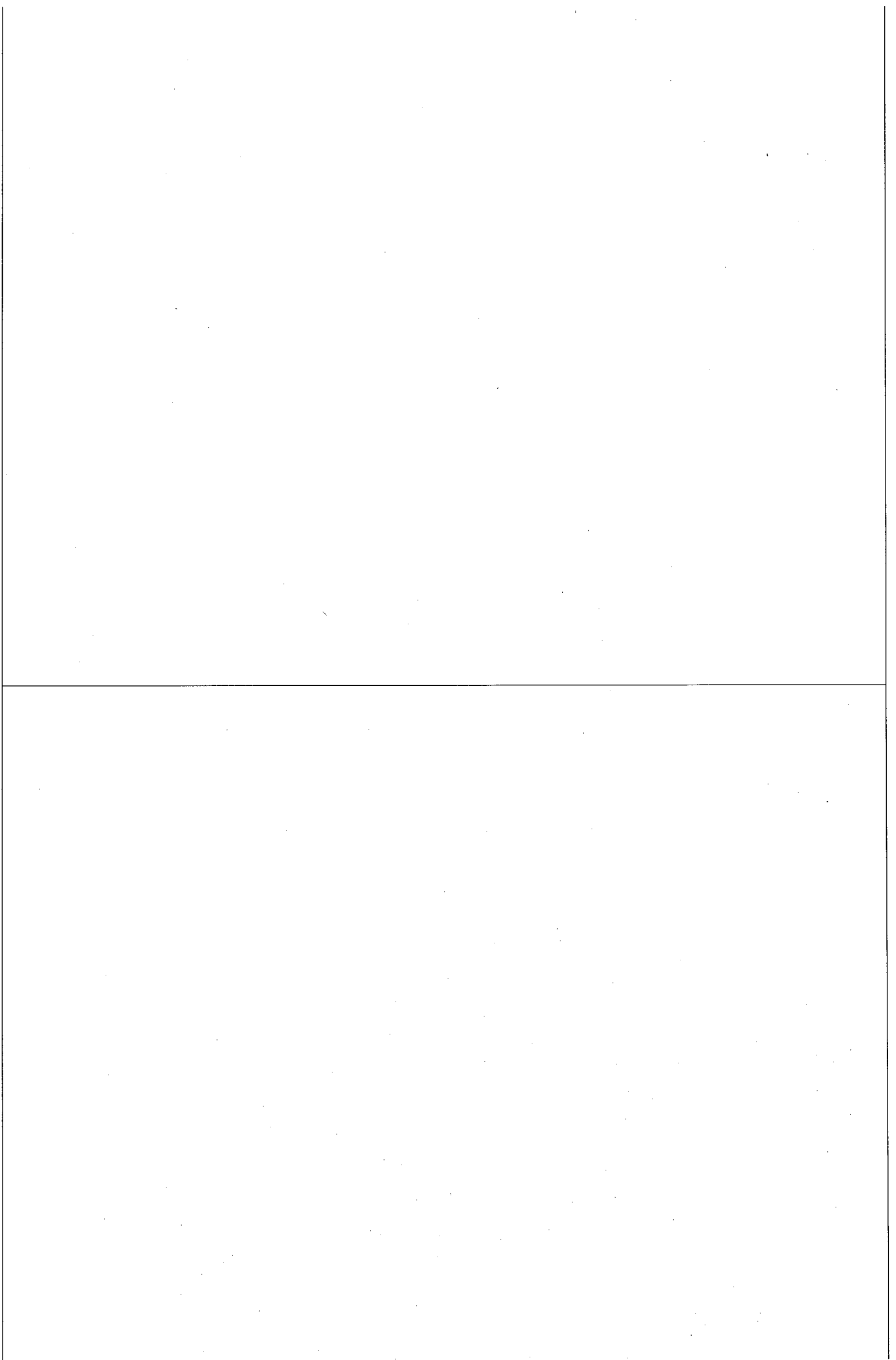
- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
- Section 302/304 (40CFR355.30 / 40CFR355.40): Substance not listed.
- Section 313 (40CFR372.65): Substance is not listed.
- TSCA (Toxic Substances Control Act): Substance is listed.
- Carcinogenic categories
- EPA (Environmental Protection Agency) Substance is not listed.
- TLV (Threshold Limit Value established by ACGIH) Substance is not listed.
- MAK (German Maximum Workplace Concentration) Substance is not listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health) Substance is not listed.
- OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.
- National regulations
- Water hazard class: Generally not hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

**16 Other information**

- This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.
- Department issuing MSDS: Environmental Health and Safety.
- Contact: Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 741-1000
- Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 724-7000
- Data compared to the previous version altered.

(Contd. on page 6)

USA



**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: **Macro-Prep® Methyl HIC Column**
- Catalog or product number: 1660413, 1660413EDU, 9704353, 9703006
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547  
(510)741-1000
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment:  
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:  
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.  
The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.
- Label elements
- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GefStoffV).
- Safety phrases:  
60 This material and its container must be disposed of as hazardous waste.
- 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 non-hazardous additions.

Trade name: **Macro-Prep® Methyl HIC Column**

(Contd. of page 1)

| Listing of dangerous and non-hazardous components:  |         |
|---|---------|
| 72642-12-7 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with oxydi-2,1-ethanedyl bis(2-methyl-2-propenoate) | 35-50%  |
| 64-17-5 ethanol   | 5-10%   |
| 7732-18-5 water   | 50-100% |

Additional information For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- General information No special measures required.
- After inhalation Supply fresh air, consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Rinse opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

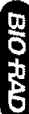
- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions: No special measures required.
- Methods and material for containment and cleaning up: Pick up mechanically.
- Reference to other sections
- No dangerous substances are released.
- See Section 7 for information on safe handling
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling No special measures required.
- Information about protection against explosions and fires: No special measures required.



Trade name: Macro-Prep® Methyl HIC Column

(Contd. of page 2)

- Conditions for safe storage, including any incompatibilities
- Storage
- Requirements to be met by storerooms and receptacles: According to product specification
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.
- 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:
 

|   |
|---|
| 64-17-5 ethanol   |
| PEL (1) 1900 mg/m <sup>3</sup> ; 1000 ppm                   |
| REL (1) 1900 mg/m <sup>3</sup> ; 1000 ppm                   |
| TLV (1) Short-term value: 1880 mg/m <sup>3</sup> ; 1000 ppm |
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment
- General protective and hygienic measures: The usual precautionary measures for handling chemicals should be followed.
- Protection of hands: Protective gloves.
- Material of gloves: Synthetic gloves
- 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: Safety glasses

**9 Physical and chemical properties**

- Information on basic physical and chemical properties
- General information
- Appearance:
 

|                    |                 |
|--------------------|-----------------|
| Form:              | Solid           |
| Color:             | White           |
| Odor:              | Odorless        |
| · Odour threshold: | Not determined. |
| · pH-value:        | Not applicable. |
- Change in condition
- Melting point/Melting range: undetermined
- Boiling point/Boiling range: undetermined
- Flash point: Not applicable
- Flammability (solid, gaseous) Not determined.
- Ignition temperature: 425°C
- Decomposition temperature: Not determined.

(Contd. on page 4) USA



Trade name: Macro-Prep® Methyl HIC Column

(Contd. of page 3)

- Auto igniting: Product is not selfigniting.
- Danger of explosion: Product does not present an explosion hazard.
- Explosion limits:
 

|        |                 |
|--------|-----------------|
| Lower: | Not determined. |
| Upper: | Not determined. |
- Vapor pressure at 20°C: 23 hPa
- Density at 20°C: 0.98946 g/cm<sup>3</sup>
- Relative density: Not determined.
- Vapour density: Not applicable.
- Evaporation rate: Not applicable.
- Solubility in / Miscibility with
 

|  |                 |
|--|-----------------|
| Water:                                     | Fully miscible  |
| · Partition coefficient (n-octanol/water): | Not determined. |
- Viscosity:
 

|            |                 |
|------------|-----------------|
| dynamic:   | Not applicable. |
| kinematic: | Not applicable. |
- Solvent content:
 

|                      |  |
|----------------------|--|
| Organic solvents:    | 8.4 %                                      |
| Water:               | 51.6 %                                     |
| · Solids content:    | 40.0 %                                     |
| · Other information: | No further relevant information available. |

**10 Stability and reactivity**

- Reactivity
- 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: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
 

|   |                           |
|---|---------------------------|
| LD <sub>50</sub> /CS <sub>50</sub> values for hazardous components per OSHA criteria: |                           |
| 64-17-5 ethanol   |                           |
| Oral  | LD50 7060 mg/kg (rat)     |
| Inhalative  | LC50/4 h 20000 mg/l (rat) |
- Primary irritant effect:
 

|                |                     |
|----------------|---------------------|
| · on the skin: | No irritant effect. |
|----------------|---------------------|

(Contd. on page 5) USA



Trade name: Macro-Prep® Methyl HIC Column

(Contd. of page 4)

- on the eye:  
No irritant effect.  
Irritant effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:  
The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:  
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- Carcinogenic categories
- IARC (International Agency for Research on Cancer)  
None of the ingredients is listed.
- NTP (National Toxicology Program)  
None of the ingredients is listed.
- Target organs: Not applicable.

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: Generally not hazardous for water.
- 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  
Hand over to hazardous waste disposers.  
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
- DOT, ADR, ADN, IMDG, IATA
- Packing group
- Hazard class
- Label
- Special provisions
- Transport name
- Transport hazard class(es)
- Class
- Packing group
- Environmental hazards:
- Marine pollutant:
- Special precautions for user
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Transport/Additional information:

(Contd. on page 6)

USA

Trade name: Macro-Prep® Methyl HIC Column

(Contd. of page 5)

- UN proper shipping name
- DOT, ADR, ADN, IMDG, IATA
- Transport hazard class(es)
- DOT, ADR, ADN, IMDG, IATA
- Class
- Packing group
- DOT, ADR, IMDG, IATA
- Environmental hazards:
- Marine pollutant:
- Special precautions for user
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Transport/Additional information:

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)  
· Section 302/304 (40CFR355.30 / 40CFR355.40):  
None of the ingredients is listed.
- Section 313 (40CFR372.65):  
None of the ingredients is listed.
- TSCA (Toxic Substances Control Act):  
64-17-5 ethanol
- 7732-18-5 water
- California Proposition 65:  
Developmental Toxicity  
64-17-5 ethanol
- Carcinogenic categories
- EPA (Environmental Protection Agency)  
None of the ingredients is listed.
- TLV (Threshold Limit Value established by ACGIH)  
64-17-5 ethanol
- MAK (German Maximum Workplace Concentration)  
64-17-5 ethanol
- NIOSH-Ca (National Institute for Occupational Safety and Health)  
None of the ingredients is listed.
- OSHA-Ca (Occupational Safety & Health Administration)  
None of the ingredients is listed.

(Contd. on page 7)

USA

# BIO-PAD

## Material Safety Data Sheet

Trade name: Macro-Prep® Methyl HIC Column

(Contd. of page 6)

### National regulations

#### Technical instructions (air):

| Class | Share in % |
|-------|------------|
| NK    | 5-10       |

- Water hazard class: Generally not hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

### 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing MSDS: Environmental Health and Safety.

Contact: Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547. 1(510) 741-1000

Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547. 1(510) 724-7000

\* Data compared to the previous version altered.

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: **Lysozyme Lyophilized**
- Catalog or product number: 1660415, 1660415EDU, 9702999
- CAS Number: 9001-63-2
- EC number: 232-620-4
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547
- Information department:  
Technical services; customer support  
lsj\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

(510)741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC not applicable
- Information concerning particular hazards for human and environment: not applicable
- Classification system:  
The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.
- Label elements
- Labelling according to EU guidelines:  
Observe the general safety regulations when handling chemicals  
The substance is not subject to classification according to EU lists and other sources of literature known to us.  
The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GefStoffV).
- Safety phrases:  
22 Do not breathe dust.  
24/25 Avoid contact with skin and eyes.  
35 This material and its container must be disposed of in a safe way.
- Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

(Contd. on page 2)

USA

Trade name: **Lysozyme Lyophilized**

(Contd. of page 1)

**3 Composition/information on ingredients**

- Chemical characterization: Substances
- CAS No. Description:  
9001-63-2 Lysozyme
- Identification number(s):
- EC number: 232-620-4
- Additional information: For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- General information No special measures required.
- After inhalation Supply fresh air; consult doctor in case of complaints.
- After skin contact Generally the product does not irritate the skin.
- After eye contact Rinse opened eye for several minutes under running water.
- After swallowing Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions: No special measures required.
- Methods and material for containment and cleaning up: Dispose contaminated material as waste according to item 13.
- Reference to other sections
- No dangerous substances are released.
- See Section 7 for information on safe handling
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

**7 Handling and storage**

- Handling
- Precautions for safe handling  
No special measures required.  
Prevent formation of dust.

(Contd. on page 3)

USA

Trade name: Lysozyme Lyophilized

- Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
- Storage
- Requirements to be met by storerooms and receptacles: According to product specification
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.
- Specific end use(s) No further relevant information available.

(Contd. of page 2)

**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: Not required.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment
- General protective and hygienic measures The usual precautionary measures for handling chemicals should be followed.
- 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.
- Protection of hands: Protective gloves
- Material of gloves: Synthetic gloves
- 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: Safety glasses

**9 Physical and chemical properties**

- Information on basic physical and chemical properties
- General Information
- Appearance: Crystalline powder
- Form: Solid
- Color: Whitish
- Odor: Odorless
- Odour threshold: Not determined.
- pH-value: Not applicable.
- Change in condition
- Melting point/Melting range: undetermined
- Boiling point/Boiling range: undetermined
- Flash point: Not applicable
- Flammability (solid, gaseous) Product is not flammable.
- Ignition temperature:
- Decomposition temperature: Not determined.

(Contd. on page 4) USA

Trade name: Lysozyme Lyophilized

- Auto igniting: Not determined.
- Danger of explosion: Product does not present an explosion hazard.
- Explosion limits: Not determined.
- Lower: Not determined.
- Upper: Not applicable.
- Vapor pressure: Not applicable.
- Density: Not determined
- Relative density: Not determined.
- Vapour density: Not applicable.
- Evaporation rate: Not applicable.
- Solubility in / Miscibility with Water: Fully miscible
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity: dynamic: Not applicable.
- kinematic: Not applicable.
- Organic solvents: 0,0 %
- Solids content: 100,0 %
- Other information: No further relevant information available.

(Contd. of page 3)

**10 Stability and reactivity**

- Reactivity
- 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: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect: on the skin: No irritant effect.
- on the eye: No irritant effect.
- No irritant effect.
- Irritant effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information: When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- The substance is not subject to classification according to the latest version of the EU lists.

(Contd. on page 5) USA

Trade name: Lysozyme Lyophilized

|  |  |
|--|--|
| (Contd. of page 4)                                   |  |
| · Carcinogenic categories                            |  |
| · IARC (International Agency for Research on Cancer) |  |
| · Substance is not listed.                           |  |
| · NTP (National Toxicology Program)                  |  |
| · Substance is not listed.                           |  |
| · Target organs: Not applicable.                     |  |

**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: Generally not hazardous for water.
- 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: Hand over to hazardous waste disposers. Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- Recommended cleansing agent: Water, if necessary with cleansing agents.

**14 Transport information**

|                              |      |
|------------------------------|------|
| · UN-Number                  | Void |
| · DOT, ADR, ADN, IMDG, IATA  | Void |
| · UN proper shipping name    | Void |
| · DOT, ADR, ADN, IMDG, IATA  | Void |
| · Transport hazard class(es) | Void |
| · DOT, ADR, ADN, IMDG, IATA  | Void |
| · Class                      | Void |
| · Packing group              | Void |
| · DOT, ADR, IMDG, IATA       | Void |

Trade name: Lysozyme Lyophilized

|   |  |
|---|--|
| (Contd. of page 5)  |  |
| · Environmental hazards:  | No   |
| · Marine pollutant:   | Not applicable.                                      |
| · Special precautions for user  | Not applicable.                                      |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable.                                      |
| · Transport/Additional information:                                       | Not dangerous according to the above specifications. |

**15 Regulatory information**

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
- Section 302/304 (40CFR355.30 / 40CFR355.40): Substance not listed.
- Section 313 (40CFR372.65): Substance is not listed.
- TSCA (Toxic Substances Control Act): Substance is listed.
- Carcinogenic categories
- EPA (Environmental Protection Agency): Substance is not listed.
- TLV (Threshold Limit Value established by ACGIH): Substance is not listed.
- MAK (German Maximum Workplace Concentration): Substance is not listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health): Substance is not listed.
- OSHA-Ca (Occupational Safety & Health Administration): Substance is not listed.

**16 Other information**

- National regulations
  - Water hazard class: Generally not hazardous for water.
  - Chemical safety assessment: A Chemical Safety Assessment has not been carried out.
- This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.
- Department issuing MSDS: Environmental Health and Safety.
  - Contact:

Printing date 11/07/2012

## Material Safety Data Sheet

Reviewed on 09/11/2012

Page 7/7

**BIO-RAD**

Trade name: **Lysozyme Lyophilized**

Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547. (510) 741-1000 (Cont'd. of page 6)

Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547. (510) 724-7000

\* Data compared to the previous version altered.

USA

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: **LB Broth, Capsules**
- Catalog or product number: 1660412EDU, 10011390, 9703004, 9704235, 10012359
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available.
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

(510)741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC  
Irritant to eyes.  
Irritant to skin.  
Irritant to respiratory system and skin.  
Xi: Irritant  
R36/38: Irritating to eyes and skin.
- Information concerning particular hazards for human and environment:  
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:  
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.
- The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information.
- Label elements
- Labelling according to EU guidelines:  
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials
- Code letter and hazard designation of product



Xi Irritant

- Risk phrases:  
36/38 Irritating to eyes and skin.

(Contd. on page 2) USA

Trade name: **LB Broth, Capsules**

(Contd. of page 1)

- Safety phrases:  
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
36/37 Wear suitable protective clothing and gloves.  
60 This material and its container must be disposed of as hazardous waste.
- Emergency overview:  
Routes of exposure: Skin
- 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 non-hazardous additions.
  - Listing of dangerous and non-hazardous components:
- |            |                  |           |
|------------|------------------|-----------|
| 91079-40-2 | Peptones, casein | 35-50%    |
| 8073-01-2  | Yeast Extract    | 20-35%    |
| 7647-14-5  | sodium chloride  | XI R36/38 |
- Additional information For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- 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 Induce vomiting and call for medical help.
- 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 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2 extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: Wear self-contained respiratory protective device.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions: No special measures required.
- Methods and material for containment and cleaning up: Pick up mechanically.

(Contd. on page 3) USA

Trade name: LB Broth, Capsules

- **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.

(Contd. of page 2)

**7 Handling and storage**

- **Handling**  
· Precautions for safe handling: No special measures required.  
· Information about protection against explosions and fires: No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage**  
· Requirements to be met by storerooms and receptacles: According to product specification  
· Information about storage in one common storage facility: Not required.  
· Further information about storage conditions: Keep receptacle tightly sealed.  
· 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:  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **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.  
Avoid contact with the eyes and skin.
- **Protection of hands:** Protective gloves.
- **Material of gloves:** Synthetic gloves
- **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:**  
Safety glasses  
Tightly sealed goggles.

**9 Physical and chemical properties**

- **Information on basic physical and chemical properties**
- **General information**
- **Appearance:**
- **Form:**
- **Color:**

Tablets  
Light brown

(Contd. on page 4)  
USA

Trade name: LB Broth, Capsules

(Contd. of page 3)

|  |  |
|--|--|
| · <b>Odor:</b>   | Sweetish   |
| · <b>Odour threshold:</b>  | Not determined.                                      |
| · <b>pH-value:</b>   | Not applicable.                                      |
| · <b>Change in condition</b><br>· <b>Melting point/Melting range:</b><br>· <b>Boiling point/Boiling range:</b> | undetermined<br>undetermined                         |
| · <b>Flash point:</b>  | Not applicable                                       |
| · <b>Flammability (solid, gaseous)</b>   | Not determined.                                      |
| · <b>Ignition temperature:</b>   | Not determined.                                      |
| · <b>Decomposition temperature:</b>  | Product is not selfigniting.                         |
| · <b>Auto igniting:</b>  | Product does not present an explosion hazard.        |
| · <b>Danger of explosion:</b>  | Not determined.                                      |
| · <b>Explosion limits:</b><br>Lower:<br>Upper:   | Not determined.<br>Not determined.                   |
| · <b>Vapor pressure:</b>   | Not applicable.                                      |
| · <b>Density:</b><br>· <b>Relative density</b><br>· <b>Vapour density</b>                                      | Not determined<br>Not determined.<br>Not applicable. |
| · <b>Evaporation rate</b>  | Not applicable.                                      |
| · <b>Solubility in / Miscibility with</b><br>Water:  | Fully miscible                                       |
| · <b>Partition coefficient (n-octanol/water):</b>  | Not determined.                                      |
| · <b>Viscosity:</b><br>dynamic:<br>kinematic:  | Not applicable.<br>Not applicable.                   |
| · <b>Solvent content:</b><br>Organic solvents:   | 0.0 %  |
| · <b>Solids content:</b>   | 100.0 %  |
| · <b>Other information</b>   | No further relevant information available.           |

**10 Stability and reactivity**

- **Reactivity**
- **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:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known

(Contd. on page 5)  
USA



Trade name: LB Broth, Capsules

(Contd. of page 4)

11 Toxicological information

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect:
  - on the skin: Irritant to skin and mucous membranes.
  - on the eye: Irritant effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
  - The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: Irritant
- Carcinogenic categories
- IARC (International Agency for Research on Cancer)
  - None of the ingredients is listed.
- NTP (National Toxicology Program)
  - None of the ingredients is listed.
- Target organs:
  - Skin.
  - Eye.

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: Generally not hazardous for water.
- 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
  - Hand over to hazardous waste disposers.
  - Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

(Contd. on page 6) USA

Trade name: LB Broth, Capsules

(Contd. of page 5)

Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

- UN-Number: Void
- ADR, ADN, IMDG, IATA: Void
- UN proper shipping name: Void
- ADR, ADN, IMDG, IATA: Void
- Transport hazard class(es):
- ADR, ADN, IMDG, IATA: Void
- Class: Void
- Packing group: Void
- ADR, IMDG, IATA: Void
- Environmental hazards:
- Marine pollutant: No
- Special precautions for user: Not applicable.
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
  - Section 302/304 (40CFR355.30 / 40CFR355.40):
    - None of the ingredients is listed.
  - Section 313 (40CFR372.65):
    - None of the ingredients is listed.
- TSCA (Toxic Substances Control Act):
  - 8013-01-2 | Yeast Extract
  - 7647-14-5 | sodium chloride
- Carcinogenic categories
- EPA (Environmental Protection Agency)
  - None of the ingredients is listed.
- TLV (Threshold Limit Value established by ACGIH)
  - None of the ingredients is listed.
- MAK (German Maximum Workplace Concentration)
  - None of the ingredients is listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health)
  - None of the ingredients is listed.

(Contd. on page 7) USA

# BIO-RAD Material Safety Data Sheet

Trade name: LB Broth, Capsules

(Contd. of page 6)

- OSHA-Ca (Occupational Safety & Health Administration)  
None of the ingredients is listed.
- National regulations
- Water hazard class: Generally not hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

## 76 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing MSDS: Environmental Health and Safety;
- Contact: Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 741-1000

Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 724-7000  
\* Data compared to the previous version altered.

**1 Identification of the substance/mixture and of the company/undertaking**

- Product identifier
- Trade name: **Ampicillin, lyophilized**
- Catalog or product number: 1660407, 1660407EDU, 9702928
- CAS Number: 69-52-3
- EC number: 200-708-1
- Relevant identified uses of the substance or mixture and uses advised against  
No further relevant information available
- Application of the substance / the preparation Laboratory chemicals
- Details of the supplier of the safety data sheet
- Manufacturer/Supplier:  
Bio-Rad Laboratories, Life Science Group  
2000 Alfred Nobel Drive  
Hercules, California 94547
- Information department:  
Technical services, customer support  
lsg\_techserv\_us@bio-rad.com
- Emergency telephone number:  
1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.  
510-741-1000

(510)741-1000

**2 Hazards identification**

- Classification of the substance or mixture
- Classification according to Directive 67/548/EEC or Directive 1999/45/EC  
Irritant to eyes.  
Irritant to skin.  
Irritant to respiratory system.  
Irritant to respiratory system and skin.  
Xi: Irritant  
R36/37/38: Irritating to eyes, respiratory system and skin.
- Information concerning particular hazards for human and environment: not applicable
- Classification system:  
The classification was made according to OSHA 29CFR 1910.1200 and 1910.1030, and is expanded upon from company and/or literature information
- Label elements
- Labelling according to EU guidelines:  
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials
- Code letter and hazard designation of product:



Xi Irritant

- Risk phrases:  
36/37/38 Irritating to eyes, respiratory system and skin.

(Contd. on page 2)

USA

**Trade name: Ampicillin, lyophilized**

(Contd. of page 1)

- Safety phrases:  
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
35 This material and its container must be disposed of in a safe way.  
36 Wear suitable protective clothing
- Emergency overview:
- Routes of exposure:  
Inhalation  
Skin
- Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

**3 Composition/information on ingredients**

- Chemical characterization: Substances
- CAS No. Description:  
69-52-3 sodium [2S-[2alpha,5alpha,6(S)]]-6-  
(aminophenylacetamido)-3,3-dimethyl-7-oxo-4-thia-1-  
azabicyclo[3.2.0]heptane-2-carboxylate
- Identification number(s):
- EC number: 200-708-1
- Additional information: For the wording of the listed risk phrases refer to section 15.

**4 First aid measures**

- Description of first aid measures
- 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 Induce vomiting and call for medical help.
- Information for doctor
- Most important symptoms and effects, both acute and delayed Breathing difficulty
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

**5 Firefighting measures**

- Extinguishing media
- Suitable extinguishing agents  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: Wear self-contained respiratory protective device.

**6 Accidental release measures**

- Personal precautions, protective equipment and emergency procedures Wear protective clothing.
- Environmental precautions: No special measures required.

(Contd. on page 3)

USA

Trade name: Ampicillin, lyophilized

(Contd. of page 2)

- Methods and material for containment and cleaning up: 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.

**7 Handling and storage**

- Handling
  - Precautions for safe handling: No special measures required.
  - Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
- Storage
  - Requirements to be met by storerooms and receptacles: According to product specification
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
  - 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: Not required.
- 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.
  - 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.
- Protection of hands: Protective gloves.
- Material of gloves: Synthetic gloves
- 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:
  - Safety glasses
  - Tightly sealed goggles.

(Contd. on page 4)

USA

Trade name: Ampicillin, lyophilized

(Contd. of page 3)

**9 Physical and chemical properties**

|   |   |
|---|---|
| Information on basic physical and chemical properties |   |
| General information                                   |   |
| Appearance:   | Crystalline                                   |
| Form:   | Light yellow                                  |
| Color:  | Odorless                                      |
| Odor:   | Not determined.                               |
| Odour threshold:                                      | Not applicable.                               |
| pH-value:   | Not applicable.                               |
| Change in condition                                   | 240°C   |
| Melting point/Melting range:                          | undetermined                                  |
| Boiling point/Boiling range:                          | Not applicable                                |
| Flash point:  | Product is not flammable.                     |
| Flammability (solid, gaseous)                         | Product is not flammable.                     |
| Ignition temperature:                                 | Not determined.                               |
| Decomposition temperature:                            | Not determined.                               |
| Auto igniting:  | Not determined.                               |
| Danger of explosion:                                  | Product does not present an explosion hazard. |
| Explosion limits:                                     | Not determined.                               |
| Lower:  | Not determined.                               |
| Upper:  | Not determined.                               |
| Vapor pressure:                                       | Not applicable.                               |
| Density:  | Not determined.                               |
| Relative density                                      | Not determined.                               |
| Vapour density  | Not applicable.                               |
| Evaporation rate                                      | Not applicable.                               |
| Solubility in / Miscibility with Water:               | Fully miscible                                |
| Partition coefficient (n-octanol/water):              | Not determined.                               |
| Viscosity:  | Not applicable.                               |
| dynamic:  | Not applicable.                               |
| kinematic:  | Not applicable.                               |
| Organic solvents:                                     | 0.0 %   |
| Solids content:                                       | 100.0 %                                       |
| Other information                                     | No further relevant information available.    |

**10 Stability and reactivity**

- Reactivity
- Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known

(Contd. on page 5)

USA

Trade name: Ampicillin, lyophilized

(Contd. of page 4)

- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known

**11 Toxicological information**

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect: on the skin: Irritant to skin and mucous membranes.
- on the eye: Irritant effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
- Carcinogenic categories
- IARC (International Agency for Research on Cancer)
- Substance is not listed.
- NTP (National Toxicology Program)
- Substance is not listed.
- Target organs: Skin, Eye.

**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: Generally not hazardous for water.
- PBT: Not applicable.
- vPvB: Not applicable.
- Other adverse effects: No further relevant information available.

**13 Disposal considerations**

- Waste treatment methods
- Recommendation: Hand over to hazardous waste disposers. Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

(Contd. on page 6) USA

Trade name: Ampicillin, lyophilized

(Contd. of page 5)

- Recommended cleansing agent: Water, if necessary with cleansing agents.

**14 Transport information**

|   |                 |
|---|-----------------|
| • UN-Number   | Void            |
| • DOT, ADR, ADN, IMDG, IATA   | Void            |
| • UN proper shipping name   | Void            |
| • DOT, ADR, ADN, IMDG, IATA   | Void            |
| • Transport hazard class(es)  | Void            |
| • DOT, ADR, ADN, IMDG, IATA   | Void            |
| • Class   | Void            |
| • Packing group   | Void            |
| • DOT, ADR, IMDG, IATA  | Void            |
| • Environmental hazards:  | No              |
| • Marine pollutant:   | No              |
| • Special precautions for user  | Not applicable. |
| • Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |

**15 Regulatory information**

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- SARA (Superfund Amendments and Reauthorization Act of 1986 - USA)
- Section 302/304 (40CFR355.30 / 40CFR355.40): Substance not listed.
- Section 313 (40CFR372.65): Substance is not listed.
- TSCA (Toxic Substances Control Act): Substance is not listed.
- Carcinogenic categories
- EPA (Environmental Protection Agency) Substance is not listed.
- TLV (Threshold Limit Value established by ACGIH) Substance is not listed.
- MAK (German Maximum Workplace Concentration) Substance is not listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health) Substance is not listed.
- OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.

(Contd. on page 7) USA

## Material Safety Data Sheet

**BIO-RAD**

Trade name: Ampicillin, lyophilized

(Contd. of page 6)

- National regulations
- Water hazard class: Generally not hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

### 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing MSDS: Environmental Health and Safety.
- Contact: Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 741-1000
- Diagnostic Group, Environmental Health and Safety, 4000 Alfred Nobel Drive, Hercules, California, 94547; 1(510) 724-7000
- \* Data compared to the previous version altered.

USA