

SAFETY DATA SHEET

RNA-spin Total RNA Extraction Kit - R-Buffer

Date of issue: 2018-06-01

Revision date: 2018-06-01

Version: R0001.0001

1. IDENTIFICATION

A. Product name

- RNA-spin Total RNA Extraction Kit - R-Buffer

B. Recommended use and restriction on use

- General use : Laboratory chemicals
 - Restriction on use : Not available

C. Manufacturer / Supplier / Distributor information

o Manufacturer information

- Company name : iNtRON Biotechnology, Inc.
 - Address : #1011 Jungang Induspia V B/D, 137, Sagimakgol-ro, Jungwon-gu, Seongnam, Gyeonggi-do, 13202, Korea
 - Dept. : CRT center
 - Telephone number : +82-31-739-5737
 - Emergency telephone number :
 - Fax number : +82-31-739-5264
 - E-mail address : intronbio@intronbio.com

o Supplier/Distributor information

- Company name : iNtRON Biotechnology, Inc.
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2. HAZARD IDENTIFICATION

A. GHS Classification

- Acute toxicity (oral) : Category4
 - Skin corrosion/irritation : Category1A

B. GHS label elements

o Hazard symbols



o Signal words

- Danger

o Hazard statements

- H302 Harmful if swallowed

- H314 Causes severe skin burns and eye damage

○ **Precautionary statements**

1) Prevention

- P260 Do not breathe dust/fume.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

2) Response

- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 Immediately call a POISON CENTER or doctor/physician.
- P321 Specific treatment
- P330 Rinse mouth.
- P363 Wash contaminated clothing before reuse.

3) Storage

- P405 Store locked up.

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

○ **NFPA grade (0 ~ 4 level)**

- Health : 3, Flammability : 0, Reactivity : 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
Guanidine isothiocyanate	-	593-84-0	20 ~ 50%
Diethyl pyrocarbonate	-	1609-47-8	0.05 ~ 0.2%
2-Amino-2-(hydroxymethyl)-1,3-propanediol	1,3-Propanediol, 2-amino-2-(hydroxymethyl)-; Trometamol ; Tris(hydroxymethyl)methylamine ; Tris buffer ; Trihydroxymethylaminomethane ; Propane-1,3-diol, 2-amino-2-(hydroxymethyl)- ; Aminomethane ; Tromethamine ; 2-Amino-1,3-dihydroxy-2-(hydroxymethyl)propane ; 2-Amino-2-(hydroxymethyl)propane-1,3-diol ; 2-Amino-2-methylol-1,3-propanediol ; Aminotri(hydroxymethyl)methane ; Aminotrimethylolmethane ; Aminotris(hydroxymethyl)methane ; Methanamine, 1,1,1-tris(hydroxymethyl)- ; Tri(hydroxymethyl)methylamine ; Trimethylolaminomethane ; Tris(hydroxymethyl)aminomethane ; Tris(hydroxymethyl)methanamine ; Tris(methylolamino)methane ; [2-Hydroxy-1,1-bis(hydroxymethyl)ethyl]amine ; Tromethane ; Tromethanmin ;	77-86-1	0.0001 ~ 0.001%

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.

B. Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.
- Get medical attention immediately.
- Prevent the spread of the skin.
- Wash thoroughly after handling.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.

D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.

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

- Not available

F. Notes to physician

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

5. FIREFIGHTING MEASURES**A. Suitable (Unsuitable) extinguishing media**

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- Not available

C. Special protective actions for firefighters

- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Using a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
- Avoid inhalation of materials or combustion by-products.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Keep containers cool with water spray.
- Fine powder may cause ignition.

6. ACCIDENTAL RELEASE MEASURES**A. Personal precautions, protective equipment and emergency procedures**

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Ventilate closed spaces before entering.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Avoid dust formation.
- Moist with water to prevent dust scattering.
- Avoid skin contact and inhalation.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Dust spills : Cover dust spills with plastic sheet or waterproof cloth to minimize spreading and avoid contact with water.
- Small liquid state spills: Appropriate container for disposal of spilled material collected.
- For disposal of spilled material in appropriate containers collected and clear surface.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid direct physical contact.
- Since emptied containers retain product residue(vapor, liquid, solid) follow all MSDS and label warnings even after container is emptied.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Minimize occurrence of dust and accumulation.

B. Conditions for safe storage, including any incompatibilities

- Do not apply direct heat.
- Do not apply any physical shock to container.
- Keep in the original container.
- Prevent static electricity and keep away from combustible materials or heat sources.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

- o **ACGIH TLV**
 - Not available
- o **OSHA PEL**
 - Not available

B. Engineering controls

- A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.

C. Individual protection measures, such as personal protective equipment

- o **Respiratory protection**
 - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
 - Dust, mist, fume-purifying respiratory protection
 - Any air-purifying respirator with a corpuscle filter of high efficiency
 - Any respiratory protection with a electromotion fan(for dust, mist, fume-purifying)
 - Self-contained breathing apparatus with a corpuscle filter of high efficiency
 - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
- o **Eye protection**
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- o **Hand protection**
 - Wear appropriate glove.
- o **Skin protection**
 - Wear appropriate clothing.

○ Others

- Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

[Guanidine isothiocyanate]

A. Appearance	
- Appearance	Solid (Powder)
- Color	Colorless
B. Odor	Odorless
C. Odor threshold	No data
D. pH	4.8 (1,420 g/l at 20°C)
E. Melting point/Freezing point	120°C
F. Initial Boiling Point/Boiling Ranges	132.9°C
G. Flash point	34.2°C
H. Evaporation rate	No data
I. Flammability(solid, gas)	No data
J. Upper/Lower Flammability or explosive limits	No data
K. Vapour pressure	0.000000000186 mmHg (25°C)
L. Solubility	1420 (at 20°C Aqueous (clear, colorless), Soluble in alcohol)
M. Vapour density	No data
N. Specific gravity(Relative density)	1.29 (g/cm ³ 20deg C)
O. Partition coefficient of n-octanol/water	-4.04
P. Autoignition temperature	No data
Q. Decomposition temperature	No data
R. Viscosity	No data
S. Molecular weight	118.18

[Diethyl pyrocarbonate]

A. Appearance	
- Appearance	Liquid
- Color	Achromatic
B. Odor	Fruit flavor
C. Odor threshold	None
D. pH	None
E. Melting point/Freezing point	None
F. Initial Boiling Point/Boiling Ranges	93.3 ~ 94°C (at 18mmHg)
G. Flash point	69°C
H. Evaporation rate	No data
I. Flammability(solid, gas)	No data
J. Upper/Lower Flammability or explosive limits	-/-
K. Vapour pressure	No data
L. Solubility	Hydrolysis (Solvent availability: Ethanol, methanol, alcohol, hydrocarbons, esters, ketones)
M. Vapour density	None
N. Specific gravity(Relative density)	1.101-1.12 (water=1)
O. Partition coefficient of n-octanol/water	None
P. Autoignition temperature	No data
Q. Decomposition temperature	No data
R. Viscosity	1.97cP (at 20C)
S. Molecular weight	162.14

[2-Amino-2-(hydroxymethyl)-1,3-propanediol]

A. Appearance	
- Appearance	Solid
- Color	White
B. Odor	A slightly unique incense

C. Odor threshold	Not available
D. pH	10.4
E. Melting point/Freezing point	171 ~ 172 °C
F. Initial Boiling Point/Boiling Ranges	219 °C ~ 220 °C
G. Flash point	170 °C
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	- / -
K. Vapour pressure	0.000002 mmHg (at 25°C)
L. Solubility	550 mg/l
M. Vapour density	Not available
N. Specific gravity(Relative density)	1.328
O. Partition coefficient of n-octanol/water	-1.56
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	121.14

10. STABILITY AND REACTIVITY

A. Chemical Stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Hazardous Polymerization will not occur.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

- (Respiratory tracts)
 - Not available
- (Oral)
 - Harmful if swallowed
- (Eye-Skin)
 - Causes severe skin burns and eye damage

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

- Acute toxicity
 - * Oral
 - Product (ATEmix) : Not available
 - [Diethyl pyrocarbonate] : LD50 850 mg/kg Rat
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : LD50 = 5900 mg/kg rabbit (Thomson Micromedex)
 - * Dermal
 - Not available
 - * Inhalation
 - Not available
- Skin corrosion/irritation
 - Causes severe skin burns and eye damage
- Serious eye damage/irritation

- Not available
- **Respiratory sensitization**
 - Not available
- **Skin sensitization**
 - Not available
- **Carcinogenicity**
 - * **IARC**
 - Not available
 - * **OSHA**
 - Not available
 - * **ACGIH**
 - Not available
 - * **NTP**
 - Not available
 - * **EU CLP**
 - Not available
- **Germ cell mutagenicity**
 - Not available
- **Reproductive toxicity**
 - Not available
- **STOT-single exposure**
 - Not available
- **STOT-repeated exposure**
 - Not available
- **Aspiration hazard**
 - Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

- **Fish**
 - [Diethyl pyrocarbonate] : LC50 6881.765 mg/ℓ 96 hr (Estimate)
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : LC50 = 955.892 mg/ℓ 96 hr (Estimate)
- **Crustaceans**
 - [Diethyl pyrocarbonate] : LC50 16480.371 mg/ℓ 48 hr (Estimate)
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : EC50 = 19.793 mg/ℓ 48 hr (Estimate)
- **Algae**
 - [Diethyl pyrocarbonate] : EC50 3637.892 mg/ℓ 96 hr (Estimate)
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : EC50 = 163.053 mg/ℓ 96 hr (Estimate)

B. Persistence and degradability

- **Persistence**
 - [Guanidine isothiocyanate] : log Kow -4.04 (Estimate)
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : log Kow = -1.56 (HSDB)
- **Degradability**
 - Not available

C. Bioaccumulative potential

- **Bioaccumulative potential**
 - [Guanidine isothiocyanate] : BCF 3.162 (Estimate)
 - [Diethyl pyrocarbonate] : BCF 3.162 (Estimate)
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : BCF = 3 (HSDB)
- **Biodegradation**
 - Not available

D. Mobility in soil

- [Guanidine isothiocyanate] : Koc -0.961

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS**A. Disposal methods**

- Since more than two kinds of designaed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

B. Special precautions for disposal

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION**A. UN No. (IMDG CODE/IATA DGR)**

- 1759

B. Proper shipping name

- CORROSIVE SOLIDS, N.O.S.

C. Hazard Class

- 8

D. IMDG CODE/IATA DGR Packing group

- III

E. Marine pollutant

- Not applicable

F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : F-A (General fire schedule)
- EmS SPILLAGE SCHEDULE : S-B (Corrosive substances)

15. REGULATORY INFORMATION**A. National and/or international regulatory information**

- **POPs Management Law**
 - Not applicable
- **Information of EU Classification**
 - * **Classification**
 - Not applicable
- **U.S. Federal regulations**
 - * **OSHA PROCESS SAFETY (29CFR1910.119)**
 - Not applicable
 - * **CERCLA Section 103 (40CFR302.4)**
 - Not applicable
 - * **EPCRA Section 302 (40CFR355.30)**
 - Not applicable
 - * **EPCRA Section 304 (40CFR355.40)**
 - Not applicable
 - * **EPCRA Section 313 (40CFR372.65)**
 - Not applicable
- **Rotterdam Convention listed ingredients**

- Not applicable
- **Stockholm Convention listed ingredients**
 - Not applicable
- **Montreal Protocol listed ingredients**
 - Not applicable

16. OTHER INFORMATION

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2018-06-01

C. Revision number and Last date revised

- Not applicable

D. Other

- This SDS is prepared according to the Globally Harmonized System (GHS).