

# SAFETY DATA SHEET

## IQeasy plus Plant RNA Extraction Mini Kit - Buffer RW1

Date of issue: 2018-06-01

Revision date: Not applicable

Version: R0001.0001

### 1. IDENTIFICATION

#### A. Product name

- IQeasy plus Plant RNA Extraction Mini Kit - Buffer RW1

#### 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.  
 - 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

### 2. HAZARD IDENTIFICATION

#### A. GHS Classification

- Flammable liquids : Category2  
 - Serious eye damage/irritation : Category2A  
 - Germ cell mutagenicity : Category1B  
 - Carcinogenicity : Category1A  
 - Reproductive toxicity : Category1A  
 - Specific target organ toxicity(Repeated exposure) : Category1

#### B. GHS label elements

##### o Hazard symbols



- **Signal words**

- Danger

- **Hazard statements**

- H225 Highly flammable liquid and vapour
- H319 Causes serious eye irritation
- H340 May cause genetic defects
- H350 May cause cancer
- H360 May damage fertility or the unborn child
- H372 Causes damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

- **Precautionary statements**

- 1) **Prevention**

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use only non-sparking tools. Flammable liquids (chapter 2.6) 1, 2, 3
- P243 Take precautionary measures against static discharge.
- 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**

- P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P314 Get medical advice/attention if you feel unwell.
- P337+P313 If eye irritation persists: Get medical advice/attention.
- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).

- 3) **Storage**

- P403+P235 Store in a well-ventilated place. Keep cool.
- 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 : 2, Flammability : 2, Reactivity : 0

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name  | Trade names and Synonyms   | CAS No.   | Content(%) |
|--|--|-----------|------------|
| Ethanol  | Alcohol anhydrous ; Alcohol dehydrated ; Ethyl alcohol ; Ethanol solution ; Alcohol ; Fermentation alcohol ; Algrain ; Ethyl hydrate ; Ethyl hydroxide | 64-17-5   | 5 ~ 15%    |
| 1,2,3-Propanetricarboxylic acid, 2-hydroxy-, trisodium salt, dihydrate | -  | 6132-04-3 | 2 ~ 15%    |

|   |  |           |             |
|---|--|-----------|-------------|
| 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   | 0.5 ~ 5%    |
| Diethyl pyrocarbonate                     | -  | 1609-47-8 | 0.05 ~ 0.2% |

#### 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.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms (flare, irritate) occur.
- Remove contact lenses if worn.

##### 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.
- Remove contaminated clothing, shoes and isolate.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

##### C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

##### D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- Get medical attention 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.
- If exposed or concerned, get medical attention/advice.

## 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

- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- 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.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.
- Fine powder may cause ignition.
- Due to the extremely low flash point, irrigating fire extinguishing may be less effective when put out a fire.

## 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.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Move container to safe area from the leak area.
- 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.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away, isolate hazard area and deny entry.

### 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.
- Do not use plastic containers.
- Spilled material should be treated as a potential risk of waste collected.

## 7. HANDLING AND STORAGE

### A. Precautions for safe handling

- Refer to Engineering controls and personal protective equipment.
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.
- Minimize occurrence of dust and accumulation.
- Avoid contact with heat, sparks, flame or other ignition sources.
- Contaminated work clothing should not be allowed out of the workplace.

**B. Conditions for safe storage, including any incompatibilities**

- Check regularly for leaks.
- Do not use damaged containers.
- Do not apply direct heat.
- Prevent static electricity and keep away from combustible materials or heat sources.
- By specifying a storage area for carcinogenic substances.
- Collected them in sealed containers.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****A. Exposure limits**

- **ACGIH TLV**
  - [Ethanol] : STEL, 1000 ppm (1880 mg/m<sup>3</sup>)
- **OSHA PEL**
  - [Ethanol]:1000ppm 1900mg/m<sup>3</sup>

**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**

- **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.
- **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.
- **Hand protection**
  - Wear appropriate chemical resistant glove.
- **Skin protection**
  - Wear appropriate chemical resistant protective clothing.
- **Others**
  - Not available

**9. PHYSICAL AND CHEMICAL PROPERTIES**

[1,2,3-Propanetricarboxylic acid, 2-hydroxy-, trisodium salt, dihydrate]

|   |                              |
|---|------------------------------|
| A. Appearance                           |                              |
| - Appearance                            | White solid in various forms |
| - Color                                 | White solid in various forms |
| B. Odor                                 | No data                      |
| C. Odor threshold                       | No data                      |
| D. pH                                   | No data                      |
| E. Melting point/Freezing point         | 150°C                        |
| F. Initial Boiling Point/Boiling Ranges | 4927°C                       |
| G. Flash point                          | No data                      |
| 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                                   | 77g/100ml                  |
| M. Vapour density                               | No data                    |
| N. Specific gravity(Relative density)           | 1.665 (g/cm <sup>3</sup> ) |
| O. Partition coefficient of n-octanol/water     | No data                    |
| P. Autoignition temperature                     | No data                    |
| Q. Decomposition temperature                    | No data                    |
| R. Viscosity                                    | No data                    |
| S. Molecular weight                             | 294.1                      |

## [Ethanol]

|   |                       |
|---|-----------------------|
| A. Appearance                                   |                       |
| - Appearance                                    | Liquid                |
| - Color   | Colorless             |
| B. Odor   | Wine or whiskey smell |
| C. Odor threshold                               | 10 ppm                |
| D. pH   | Not available         |
| E. Melting point/Freezing point                 | -114.1 °C             |
| F. Initial Boiling Point/Boiling Ranges         | 78.5 °C               |
| G. Flash point                                  | 13 °C                 |
| H. Evaporation rate                             | Not available         |
| I. Flammability(solid, gas)                     | Not available         |
| J. Upper/Lower Flammability or explosive limits | 19 / 3.3 %            |
| K. Vapour pressure                              | 59.3 mmHg (25°C)      |
| L. Solubility                                   | 100 g / 100 ml (25°C) |
| M. Vapour density                               | 1.59 (air=1)          |
| N. Specific gravity(Relative density)           | 0.8 (water=1)         |
| O. Partition coefficient of n-octanol/water     | -0.31                 |
| P. Autoignition temperature                     | 363 °C                |
| Q. Decomposition temperature                    | Not available         |
| R. Viscosity                                    | 1.17 cP (20°C)        |
| S. Molecular weight                             | 46.07                 |

## [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**

- Cylinders exposed to fire may vent and release flammable gas.

**C. Conditions to avoid**

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- Avoid contact with heat, sparks, flame or other ignition sources.

**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)
  - Not available
- (Eye·Skin)
  - Causes serious eye irritation

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

- Acute toxicity
  - \* Oral
    - Product (ATEmix) : >5000mg/kg
    - [Ethanol] : LD50 = 6200 mg/kg Rat (HSDB)

- [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : LD50 = 5900 mg/kg rabbit (Thomson Micromedex)
- [Diethyl pyrocarbonate] : LD50 850 mg/kg Rat
- \* **Dermal**
  - Not available
- \* **Inhalation**
  - Product (ATEmix) : Not available
  - [Ethanol] : LC50 = 59.59 mg/L/4hr Rat (HSDB)
- **Skin corrosion/irritation**
  - Not available
- **Serious eye damage/irritation**
  - Causes serious eye irritation
- **Respiratory sensitization**
  - Not available
- **Skin sensitization**
  - Not available
- **Carcinogenicity**
  - \* **IARC**
    - [Ethanol] : Group 1
  - \* **OSHA**
    - Not available
  - \* **ACGIH**
    - [Ethanol] : A3
  - \* **NTP**
    - Not available
  - \* **EU CLP**
    - Not available
- **Germ cell mutagenicity**
  - May cause genetic defects
- **Reproductive toxicity**
  - May damage fertility or the unborn child
- **STOT-single exposure**
  - Not available
- **STOT-repeated exposure**
  - Causes damage to organs through prolonged or repeated exposure
- **Aspiration hazard**
  - Not available

## 12. ECOLOGICAL INFORMATION

### A. Ecotoxicity

- **Fish**
  - [Ethanol] : LC50 = 42 mg/ℓ 96 hr Oncorhynchus mykiss (ECOTOX)
  - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : LC50 = 955.892 mg/ℓ 96 hr (Estimate)
  - [Diethyl pyrocarbonate] : LC50 6881.765 mg/ℓ 96 hr (Estimate)
- **Crustaceans**
  - [Ethanol] : EC50 = 2 mg/ℓ 48 hr Daphnia magna (ECOTOX)
  - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : EC50 = 19.793 mg/ℓ 48 hr (Estimate)
  - [Diethyl pyrocarbonate] : LC50 16480.371 mg/ℓ 48 hr (Estimate)
- **Algae**
  - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : EC50 = 163.053 mg/ℓ 96 hr (Estimate)
  - [Diethyl pyrocarbonate] : EC50 3637.892 mg/ℓ 96 hr (Estimate)

### B. Persistence and degradability

- **Persistence**
  - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : log Kow = -1.56 (HSDB)
- **Degradability**
  - [Ethanol] : BOD5/COD = 0.57 ( IUCLID)



**C. Bioaccumulative potential**

- **Bioaccumulative potential**
  - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : BCF = 3 (HSDB)
  - [Diethyl pyrocarbonate] : BCF 3.162 (Estimate)
- **Biodegradation**
  - [Ethanol] : Biodegradability = 75 (%) 20 day (Aerobic, Other, Easily decomposed) ( IUCLID)

**D. Mobility in soil**

- [Ethanol] : Koc = 1

**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)**

- 1170

**B. Proper shipping name**

- ETHANOL OR ETHYL ALCOHOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL SOLUTIONS

**C. Hazard Class**

- 3

**D. IMDG CODE/IATA DGR Packing group**

- II

**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-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE : S-D (Flammable liquids)

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

- **POPs Management Law**
  - Not applicable
- **Information of EU Classification**
  - \* **Classification**
    - [Ethanol] : H225
- **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).