

SAFETY DATA SHEET

LiliF™ IBR PCR Kit

Date of issue: 2018-05-30

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Version: R0001.0001

1. IDENTIFICATION

A. Product name

- LiliF™ IBR PCR Kit [Cat : IP11281]

B. Recommended use and restriction on use

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

C. Manufacturer / Supplier / Distributor information

○ 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. : MDx center
 - Telephone number : +82-31-739-5737
 - Emergency telephone number :
 - Fax number : +82-31-739-5264
 - E-mail address : intronbio@intronbio.com

○ 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
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 - E-mail address : intronbio@intronbio.com

2. HAZARD IDENTIFICATION

A. GHS Classification

- Serious eye damage/irritation : Category2A

B. GHS label elements

○ Hazard symbols



○ Signal words

- Warning

○ Hazard statements

- H319 Causes serious eye irritation

○ Precautionary statements

1) Prevention

- P264 Wash hands thoroughly after handling.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

2) Response

- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+P313 If eye irritation persists: Get medical advice/attention.

3) Storage

- Not applicable

4) Disposal

- Not applicable

C. Other hazards which do not result in classification : (NFPA Classification)○ **NFPA grade (0 ~ 4 level)**

- Health : 1, Flammability : 0, Reactivity : 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
α -D-Glucopyranosyl α -D-glucopyranoside	-	99-20-7	< 10
Xylene cyanol	4-[[4-(Ethylamino)-3-methylphenyl][4-(ethylimino)-3-methyl-2,5-cyclohexadien-1-ylidene]methyl]-1,3-benzenedisulfonic acid monosodium salt	2650-17-1	< 1
Potassium chloride	Dipotassium dichloride ; Potassium monochloride ;	7447-40-7	< 1
Magnesium sulfate (1:1)	Sulfuric acid, magnesium salt (1:1) ; Magnesium sulfate anhydrous ;	7487-88-9	< 1
Sodium sulfate	Bisodium sulfate ; Disodium monosulfate ; Sodium sulfate (2:1) ; Disodium sulphate ; Thenardite ; Sodium sulfate anhydrous ; Disodium sulfate ;	7757-82-6	< 1
Glycerol	Glyceritol ; Glycylalcohol ; Glyrol ; Glycerin ; Glycerine ; 1,2,3-Propanetriol ; 1,2,3-Trihydroxypropane ; Glycol alcohol ; Propane-1,2,3-triol ; Glysamin ; Propanetriol	56-81-5	< 1

Tris	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	< 1
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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.
- 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.

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

- 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.

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.
- 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.

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

- Wash thoroughly after handling.
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.
- Operators should wear antistatic footwear and clothing.
- Minimize occurrence of dust and accumulation.

B. Conditions for safe storage, including any incompatibilities

- Check regularly for leaks.
- Do not apply direct heat.
- Save applicable laws and regulations.
- Please pay attention to incompatibilities materials and conditions to avoid.
- Prevent static electricity and keep away from combustible materials or heat sources.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

- o **ACGIH TLV**
 - [Glycerol] : TWA, 10 mg/m³
- o **OSHA PEL**
 - [Glycerol]: 15 mg/m³ (Total dust), 5 mg/m³ (Respirable fraction)

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.

o Others

- Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Not available
- Color	Not available
B. Odor	Not available
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	Not available
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	Not available
M. Vapour density	Not available
N. Specific gravity(Relative density)	Not available
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	Not available

[Xylene cyanol]

A. Appearance	
- Appearance	Solid
- Color	Blue to Gray
B. Odor	Not available
C. Odor threshold	Not available
D. pH	Not available

E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	295 °C
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	1g/100ml
M. Vapour density	Not available
N. Specific gravity(Relative density)	Not available
O. Partition coefficient of n-octanol/water	3.57
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	538.62

[Glycerol]

A. Appearance	
- Appearance	Liquid
- Color	Colorless
B. Odor	Light smell
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	18.1 °C
F. Initial Boiling Point/Boiling Ranges	290 °C
G. Flash point	177 °C
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Lower limit: 3, upper bound: 19 (Flash point 199 °C)
J. Upper/Lower Flammability or explosive limits	19 / 2.7 %
K. Vapour pressure	0.000168 mmHg (at 25 deg C)
L. Solubility	1000000 mg/l (25 °C)
M. Vapour density	3.1
N. Specific gravity(Relative density)	1.2613 g/cu cm
O. Partition coefficient of n-octanol/water	-1.76
P. Autoignition temperature	405 °C
Q. Decomposition temperature	290 °C
R. Viscosity	954
S. Molecular weight	92.09

[Potassium chloride]

A. Appearance	
- Appearance	Solid
- Color	Colorless
B. Odor	Odorless
C. Odor threshold	Not available
D. pH	7
E. Melting point/Freezing point	770 - 773 °C
F. Initial Boiling Point/Boiling Ranges	1407 °C
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	19 / 2.7 %
K. Vapour pressure	5.73 hPa at 906 °C
L. Solubility	342000 mg/l (20 °C)
M. Vapour density	Not available
N. Specific gravity(Relative density)	1.98

O. Partition coefficient of n-octanol/water	-0.46
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	74.55

[Magnesium sulfate]

A. Appearance	
- Appearance	Solid
- Color	White
B. Odor	Odorless
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	770 - 773 °C
F. Initial Boiling Point/Boiling Ranges	1124 °C
G. Flash point	Not available
H. Evaporation rate	Non-combustible
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	14mmHg (20 °C)
L. Solubility	20g/100ml (0 °C)
M. Vapour density	Not available
N. Specific gravity(Relative density)	2.65
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	120.37

[Sodium sulfate]

A. Appearance	
- Appearance	Solid
- Color	White
B. Odor	Odorless
C. Odor threshold	Not available
D. pH	4.9
E. Melting point/Freezing point	884 °C
F. Initial Boiling Point/Boiling Ranges	> 890 °C
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Non-combustible
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	161000 mg/l (161000-190000 at 20 °C)
M. Vapour density	Not available
N. Specific gravity(Relative density)	2.671
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	1200 °C
R. Viscosity	2.48, 22% solution at 20 °C
S. Molecular weight	142.044

[Tris]

A. Appearance	
- Appearance	Solid
- Color	White

B. Odor	Not available
C. Odor threshold	Not available
D. pH	10.4 (0.1 molar)
E. Melting point/Freezing point	171-172 °C
F. Initial Boiling Point/Boiling Ranges	219-220 °C
G. Flash point	170 °C
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Non-combustible
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	0.000002mgHg (at 25 °C)
L. Solubility	550000 mg/l (at 25 °C)
M. Vapour density	4.18
N. Specific gravity(Relative density)	1.32 (at 20.4 °C)
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

[α -D-Glucopyranosyl α -D-glucopyranoside]

A. Appearance	
- Appearance	Solid
- Color	White
B. Odor	Not available
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	203 °C
F. Initial Boiling Point/Boiling Ranges	591.67 °C (Estimated value)
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	1000000 (at 25 °C, Estimated value)
M. Vapour density	Not available
N. Specific gravity(Relative density)	1.53 g/cm3 (at 20 °C)
O. Partition coefficient of n-octanol/water	-5.48
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	342.3

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)**
 - 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) : 2000mg/kg < ATEmix <= 5000mg/kg
 - [Glycerol] : LD50 = 12600 mg/kg Rat (ChemIDplus)
 - [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : LD50 = 5900 mg/kg rabbit (Thomson Micromedex)
 - [Potassium chloride] : LD50 2600 mg/kg Rat (HSDB)
 - [Sodium sulfate] : LD50 > 10000 mg/kg Rat (SIDS)
 - * **Dermal**
 - Product (ATEmix) : Not available
 - [Glycerol] : LD50 > 10000 mg/kg Rat (ChemIDplus)
 - * **Inhalation**
 - Product (ATEmix) : Not available
 - [Glycerol] : LC50 >2.75 mg/ℓ 4 hr Rat (ECHA)
- **Skin corrosion/irritation**
 - Not available
- **Serious eye damage/irritation**
 - Causes serious eye irritation
- **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**

- [Glycerol] : LC50 >11 mg/ℓ 96 hr *Cyprinodon variegatus* (ECHA)
- [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : LC50 = 955.892 mg/ℓ 96 hr (Estimate)
- [Potassium chloride] : LC50 880 mg/ℓ 96 hr *Pimephales promelas* (OECD SIDS)
- [Magnesium sulfate (1:1)] : LC50 2820 mg/ℓ 96 hr *Pimephales promelas* (ECOTOX)
- [Sodium sulfate] : LC50 7960 mg/ℓ 96 hr *Pimephales promelas* (OECD SIDS)

- **Crustaceans**

- [Glycerol] : LC50 1955 mg/ℓ 48 hr *Daphnia magna* (ECHA)
- [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : EC50 = 19.793 mg/ℓ 48 hr (Estimate)
- [Potassium chloride] : EC50 177 mg/ℓ 48 hr *Daphnia magna* (OECD SIDS)
- [Magnesium sulfate (1:1)] : EC50 343.560 mg/ℓ 48 hr *Daphnia magna* (ECOTOX)
- [Sodium sulfate] : LC50 2564 mg/ℓ 48 hr *Daphnia magna* (ECOTOX)

- **Algae**

- [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : EC50 = 163.053 mg/ℓ 96 hr (Estimate)
- [Potassium chloride] : EC50 2500 mg/ℓ 72 hr (IUCLID)
- [Magnesium sulfate (1:1)] : EC50 2700 mg/ℓ 72 hr (IUCLID)

B. Persistence and degradability

- **Persistence**

- [α -D-Glucopyranosyl α -D-glucopyranoside] : log Kow -5.48 (NLM;ChemIDPlus)
- [4-[[4-(Ethylamino)-3-methylphenyl][4-(ethylimino)-3-methyl-2,5-cyclohexadien-1-ylidene]methyl]-1,3-benzenedisulfonic acid monosodium salt] : log Kow 3.57 (Estimate)
- [Potassium chloride] : log Kow -0.46 (OECD SIDS)
- [Magnesium sulfate (1:1)] : log Kow -0.17 (Estimate)
- [Sodium sulfate] : log Kow -3 (OECD SIDS)
- [Glycerol] : Log Kow -1.76 (HSDB)
- [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : log Kow = -1.56 (HSDB)

- **Degradability**

- Not available

C. Bioaccumulative potential

- **Bioaccumulative potential**

- [α -D-Glucopyranosyl α -D-glucopyranoside] : BCF 3.16 (Estimate)
- [4-[[4-(Ethylamino)-3-methylphenyl][4-(ethylimino)-3-methyl-2,5-cyclohexadien-1-ylidene]methyl]-1,3-benzenedisulfonic acid monosodium salt] : BCF 3.162 (Estimate)
- [Potassium chloride] : BCF 0.47 (IUCLID)
- [Sodium sulfate] : BCF 0.5 (OECD SIDS)
- [2-Amino-2-(hydroxymethyl)-1,3-propanediol] : BCF = 3 (HSDB)

- **Biodegradation**

- [Glycerol] : Biodegradability = 65 (%) 14 day (OECD 1G 301C, OECD SIDS, OECD 1G 301D, IUCLIDE), 94 % 24hr (10C removal)(ECHA)

D. Mobility in soil

- [α -D-Glucopyranosyl α -D-glucopyranoside] : Koc 10 (Estimates)

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 separtly, 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)**

- Not applicable

B. Proper shipping name

- Not applicable

C. Hazard Class

- Not applicable

D. IMDG CODE/IATA DGR Packing group

- Not applicable

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 : Not available
- EmS SPILLAGE SCHEDULE : Not available
- Air transport(IATA): Not subject to IATA regulations.

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

- 2018-05-30

C. Revision number and Last date revised

- Not applicable

D. Other

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