

SAFETY DATA SHEET (SDS)

In compliance with the EU Regulations No. 1907/2006 (REACH), No. 2015/830, No. 1272/2008 (CLP) and Commission Regulation (EU) No. 453/2010

Reagent kit for biological sample preparation for study on a scanning electron microscope
Customs commodity code 3822 00 000 0

Date of issue: March 05, 2018

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING	
1.1. Product Identifier	
Trade Name:	Reagent kit for biological sample preparation for study on a scanning electron microscope (SEM) of "BioREE" and "BioREE-B" brands.
IUPAC Name:	No
Synonyms:	No
CAS Number:	No
EC Number:	No
Registration Number (REACH):	N/a
1.2. Relevant identified uses of the substance or mixture and uses advised against	
Product use:	A reagent kit was designed for biological sample preparation (staining) for study on a scanning electron microscope in research, production and training laboratories. The reagent kit is classified as lanthanide contrast, ensuring staining of the tissues isolated from an organism and placed in conditions providing the flow of main vital processes (supravital staining) and enabling visualization of a structure of subsurface layer of a biological sample on a scanning electron microscope. Use of a reagent kit allows studying of not only surface, but also the internal structure of a biological sample, as well as working in low vacuum mode without prior fixing/dehydration/deposition of the samples.
Non-recommended methods of use:	Lanthanide contrast can't be applied to fixed tissue blocks. In addition, due to the lanthanides aggressively substituting calcium in the phosphates, use of the kit is not recommended for objects on phosphate substrates as well as for studying bones and teeth. Contact of chemicals from the reagent kit with skin, eyes and mucous membranes should be avoided, as well as leakage or accidental swallowing thereof when pipetting.
1.3. Details of the supplier of the safety data sheet	
Manufacturer:	LLC GLAUCON, a limited liability company 111024, Russian Federation, Moscow, 11A/2 shosse Entuziastov, office 6/9
Telephone:	+7 915 014 4938
E-Mail:	info@bioree.ru
1.4 Emergency telephone number	
Information on measures in case of emergency situations:	112 (Russia, European Union), 112 and 911 (United State of America, Canada)
Other information:	https://bioree.ru/

2. SECTION 2: HAZARDS IDENTIFICATION	
2.1. Classification of the substance or mixture	
According to the Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of chemical substances and mixtures (CLP) and Globally Harmonised System on the classification and labelling of chemicals (GHS):	Reagent kit is classified as a chemical product that: - has acute oral toxicity, hazard class 5; - has acute skin contact toxicity, hazard class 5; - causes skin damage (necrosis)/irritation, hazard class 3; - causes serious eye damage/irritation, hazard subclass 2B; - has an effect on the reproductive function, hazard subclass 1A
2.2. Label elements	
Signal word:	Danger
Hazard pictograms:	Health Hazard (GHS08).



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Hazard Statement Code: H303: May be harmful if swallowed;
H313: May be harmful in contact with skin;
H316: Causes mild skin irritation;
H320: Causes eye irritation;
H360: May damage fertility or the unborn child.

Precautions: P201+P202: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood;
P264: Wash hands thoroughly after handling;
P280: Wear protective gloves/protective clothing/eye protection/face protection;
P308+P311: If exposed or concerned: Call a doctor;
P312: Call a doctor if you feel unwell;
P332+P311: If skin irritation occurs: Call a doctor;
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+P311: If eye irritation persists: Call a doctor;
P405: Store locked up.

2.3. Other hazards

Prolonged or repeated exposure affects the central and peripheral nervous, endocrine, cardiovascular and respiratory systems, mineral metabolism, bone tissue, spleen, liver, kidneys, gall bladder, blood system and causes a disturbance of porphyrin metabolism.
Acetylacetone vapors have narcotic effect.

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name, Formula	CAS Number	EC Number	Mass content, %
Sodium chloride, NaCl	7647-14-5	231-598-3	2.200
Neodymium (III) chloride, NdCl ₃	10024-93-8	233-031-5	1.587
Lead (II) acetate, PbC ₄ H ₆ O ₄	6080-56-4	206-104-4	0.343
Acetylacetone, C ₅ H ₈ O ₂	123-54-6	204-634-0	1.820

4. SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General: Personnel hygiene measures have to be observed when working with the reagent kit; avoid breathing fumes, inhalation, contact with skin and eyes. Regular biocontamination control is mandatory in the lab.

Eye Contact: Rinse thoroughly under running water

Skin Contact: Rinse under running water, remove contaminated clothing and shoes.

Inhalation: Fresh air, rest, warmth.

Ingestion: Rinse mouth with water, drink plenty of water, activated charcoal and saline laxative.

4.2. Most important symptoms and effects, both acute and delayed

Eye Contact: Tearing, redness.

Skin Contact: Mild redness.

Inhalation: Coughing, sneezing, sore throat, breathing arrhythmia; inhalation of high concentrations may cause weakness, lowering blood pressure, drowsiness, headache, dizziness, shortness of breath, anemia, cyanosis of the extremities, seizures.

Ingestion: Nausea, diarrhea; if swallowed in large quantities, possible cyanosis, tachycardia, increased blood pressure, vomiting, heartburn, pigmentation of gums and teeth, convulsions.

4.3. Indication of any immediate medical attention and special treatment needed

Ingestion, inhalation, skin and eye contact.

5. SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Appropriate extinguishing media: The reagent kit isn't flammable. Extinguishing media according to the main source of ignition are used at the outbreak of fire in the warehouses and handling areas.

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Inappropriate extinguishing media: Unknown

5.2. Special hazards associated with the substance or mixture

Hazardous Products generated at the point of outbreak of fire: Carbon and chlorine oxides and acetone may be produced as the water evaporates. Thermal degradation products can cause heaviness, pressure in the head, dizziness, drowsiness, intoxication, coordination impairment, runny nose, cough, sore throat, pain in the eyes, nausea, vomiting, confusion; in severe cases, loss of consciousness and respiratory paralysis.

5.3. Advice for firefighters

Polymer packaging may be involved in the combustion process.
In the event of a fire in the warehouses and transport containers, the flame shall be extinguished in a gas mask and protective clothing. The need for evacuation from the accident area is determined on the basis of the local evacuation plan.
Cool the container with the product with water from the maximum possible distance.

6. SECTION 6: ACCIDENTAL RELEASE MEASURE

6.1. Personal precautions, protective equipment and emergency procedures

Pull the vehicle to a safe place. Isolate the danger area within a radius of 50 m. Adjust said distance according to the results of chemical reconnaissance. Clear the zone from strangers. Enter the danger area with the protective equipment. Eliminate the reason or leak. Observe the fire safety measures. Provide first aid to the injured. Send people out of the center of contamination for a medical examination.

6.2. Environmental precautions

Avoid getting into drain system and surface water bodies. Inform the sanitary and epidemiological inspection bodies if the reagent kit had caused damage to the environment.

6.3. Methods and material for containment and cleaning up

Collect the bottles.
Collect spilled components in a separate container, using inert absorbent material (sand, sawdust, vermiculite, diatomaceous earth) and send for further disposal. Wash leak location with hot water and wipe with a dry cloth. If collecting is impossible, turn over the soil.

6.4. Reference to other sections

Information on personal protective equipment is in Section 8 of this document and information about the disposal is in Section 13.

7. SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Shipping can be performed using all modes of covered vehicles, subject to shipping rules for a specific mode of transport.
When transporting the kits under -30°C , exclude the possibility of hard impact.

7.2. Conditions for safe storage, including any incompatibilities

Storage Recommendations: The reagent kit should be stored in closed dry warehouses at temperature between $+5^{\circ}\text{C}$ and $+40^{\circ}\text{C}$ and relative humidity below 90%, at least 1 meter away from heating devices and in conditions protected from contamination and aggressive environment.

Packaging Means and Materials: The reagents are placed in glass or plastic bottles with net volume of 2 or 10 ml and further placed in boxes or cartons made of cardboard or composite materials. Boxes and cartons are placed in the shipping containers: wooden, plywood or corrugated cardboard boxes.

7.3. Specific end use(s)

Before use, the containers should be checked for cleanliness and absence of foreign substances. Containers should be constructed of materials approved by the competent authorities for contact with laboratory chemicals, to ensure their safety during the shelf-life and lack of chemical interaction with them.

8. SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Maximum allowable concentration of sodium chloride aerosols in the air of working

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8.2. Exposure controls

Recommended Monitoring Procedures:

area: 5 mg/m³ (hazard class 3); lead acetate aerosols: 0.01 mg/m³ (hazard class 1, for lead).

The concentration of harmful substances in the air of the working area must be provided below set thresholds (MAC) and checked metrologically by a certified method at least once a month.

Appropriate Technical Means for Exposure Controls:

Handling of the reagent kit components should be carried out in the well-ventilated Applicable apparatus of aspiration system: cyclone filters, sleeve filters. Forced ventilation systems should be designed taking local conditions into account: airflow should be directed away from the source of emission of harmful substances and personnel. If possible, machinery and apparatus shall be designed in hermetic way. The air containing harmful substances, before being discharged into the atmosphere, shall be purified to the maximum allowable concentration set. At the end of each shift, wet cleaning should be carried out within the premises.

Containers and tools have to be disinfected at regular intervals.

Storage of food products, eating and smoking is forbidden in the premises where the reagent kit is being handled. Wash your hands and rinse your mouth before the meal; take a shower at the end of the shift.

Use of protection is necessary as the biological material samples are treated as potentially contaminated and possible to preserve and transmit HIV, hepatitis B and any other viruses.

Personal Protective Equipment:

- eye/face protection:

Safety glasses with side shields.



- skin (hands / other) protection:

Rubber gloves, protective clothes for general industrial pollution, cotton lab coats, rubber-proofed fabric apron, leather shoes.



- respiratory protection:

A cotton-gauze dressing, respirator. Filter gas mask in case of high concentrations.



- thermal effect protection:

Not applicable

Other protective measures:

Access to running water must be ensured to flush eyes. Contaminated clothing should be laundered regularly. Boots, gloves and goggles should be washed with water regularly.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	Homogeneous transparent liquids free of foreign matter and impurities.
Colour:	Sodium chloride solution: n/a; lead acetate solution (II): n/a; neodymium chloride solution: pale pinkish purple; acetylacetone solution: n/a.
Odor:	Acetylacetone solution: characteristic of acetone and acetic acid; the rest of the reagents: n/a.
Odor threshold:	Not applicable
pH:	5.0...8.0
Melting point:	Not applicable
Decomposition temperature:	No data available
Boiling point:	Not lower than 100 °C.
Flash point:	Not applicable
Auto-ignition point:	Not applicable

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Lower ignition limit:	Not applicable
Upper ignition limit:	No data available
Relative density:	No data available
Specific gravity (water = 1):	No data available
Vapor density (air = 1):	Not applicable
Vapor pressure:	No data available
Evaporation rate:	Soluble
Solubility in water:	
Solubility in other substances:	Soluble in alcohols
Partition coefficient n-octanol/water:	1.9 (for acetylacetone)
Dynamic viscosity:	No data available
Oxidizing properties:	Not applicable
Explosive properties:	Not applicable
Relative molecular weight:	No data available
9.2. Other information:	
Net weight:	60...65 g for "BioRee" brand and 140...159 g for "BioRee-B" brand

10. SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Reagents are soluble in water and ethanol.

10.2. Chemical stability

The reagent kit is stable under normal conditions of use, transport and storage; does not decompose.

10.3. Possibility of hazardous reactions

Unknown

10.4. Conditions to avoid

Avoid contact with acids and alkali, avoid overheating.

10.5. Incompatible materials

Alkalis, acids.

10.6. Hazardous decomposition products

Carbon and chlorine oxides, acetone.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Skin Contact:	Aqueous solutions of sodium chloride and neodymium (III) chloride cause mild skin irritation.
Eye Contact:	Components of the reagent kit irritate the eyes.
Inhalation:	Aerosols can irritate the mucous membranes of the respiratory system.
Ingestion:	Possible health conditions on ingestion of acetylacetone solution.
Chronic toxicity:	No data available
Acute toxicity:	<i>For sodium chloride:</i> CL50 = 3,000 mg/kg (rats, intragastric); DL50 > 10,000 mg/kg (dermal, rabbits); <i>For acetylacetone:</i> CL50 = 570...760 mg/kg (rats, intragastric); DL50 > 790...1,370 mg/kg (dermal, rabbits); CL50 > 5.1 mg/l (rats, ing., 4 h); <i>For neodymium (III) chloride:</i> CL50 = 3,692 mg/kg (intragastric, mice); <i>For lead (II) acetate:</i> CL50 = 4,665 mg/kg (rats, intragastric).
Respiratory system sensitization:	No
Skin sensitization:	No
Mutagenic effect:	No
Carcinogenicity:	No
Reproductive system effect:	

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Target organs toxicity:	Identified for lead (II) acetate. Acetylacetone causes drowsiness and dizziness. Has narcotic and neurotoxic effect. Lead (II) acetate can affect the organs through repeated or prolonged exposure.
11.2. Other Information	Has weak cumulative properties. No information about the gonadotoxic and teratogenic action of the reagent kit components in the available domestic and foreign literature.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity	<i>For sodium chloride:</i> EC50 3,310 mg/l (daphnia Magna), 48 hours; LC50 – 6,094 mg/l (rainbow trout, 96 h); <i>For acetylacetone:</i> EC50 40 mg/l (daphnia Magna, 24 hours); LC50 106 mg/l (fish, 96 h); EC100 90 mg/l (daphnia Magna, 24 hours); LC50 34,409 µg/l (daphnia Magna, 48 hours).
12.2. Persistence and degradability	Components of the reagent kit do not transform. They don't form any secondary dangerous products on interaction with external environment. Overheating after the water evaporation may release the products of thermal destruction.
12.3. Bioaccumulative potential	Poorly amenable to biological dissimilation (less than 10%).
12.4. Mobility in soil	No data available
12.5. Results of PBT and vPvB assessment	Is not considered to be PBT (persistent, bioaccumulative and toxic) or vPvB (very persistent and very bioaccumulative) mixture/substance.
12.6. Other adverse effects	No data available

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods	Waste treatment precautions are similar to the precautions used for handling finished products.
13.2. Places and methods of neutralization	Upon leakage of the reagent kit components they should be collected in a separate container and directed for recycling or disposal in specially designated areas (e.g., worked-out quarry, the industrial landfill, etc.). Disposal of non-conforming waste and screenings of raw materials should be carried out in accordance with the requirements for environmental protection and current legislation.

14. SECTION 14: TRANSPORT INFORMATION

14.1. UN number	Not applicable
14.2. UN proper shipping name	Not applicable
14.3. Transport hazard class(es)	Not classified as a dangerous good.
14.4. Packing group	Not classified as a dangerous good.
14.5. Environmental hazards	Presents no hazard to the environment if handling rules are observed.
14.6. Special precautions for user	Transport marking includes the following handling symbols: "Fragile, handle with care", "Top", "Keep dry" and the warning label "Don't throw".
14.7. Transport in Bulk according to	Annex II of MARPOL 73/78 and the International Bulk Chemical Code

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Not applicable. The reagent kit can only be transported in a container.

15. SECTION 15: REGULATORY INFORMATION

GOST 19433-88	Hazardous Goods. Classification and Marking.
GOST 31340-2013	Labelling of Chemicals. General Requirements.
GOST 32419-2013	Classification of Chemicals. General Requirements.
GOST 32423-2013	Mixtures Classification of Hazard for Health.
GOST 32424-2013	Environmental hazard classification of a chemical product. Main provisions.
GOST 32425-2013	Environmental hazard classification of a chemical mixture product.
SanPiN 2.1.7.1322-03	Hygienic requirements for placement and neutralization of industrial and consumer wastes.
GN 2.2.5.2893-11	Maximum Allowable Levels (MAL) of Skin Contamination by Harmful Substances.
GN 2.2.5.1313-03	Maximum Allowable Concentrations (MAC) of Hazardous Substances in the air of working area.
GN 2.1.5.1315-03	Maximum Allowable Concentrations (MAC) of Chemical Substances in Bodies of Water Used as Sources of Industrial and Drinking Water Supply, and for Drinking and Domestic Use.
GN 2.1.6.3492-17	Maximum Allowable Concentrations (MAC) of pollutants in the ambient atmosphere of urban and rural settlements.
R 2.2.2006-05	Guide on hygienic assessment of working environment and working process factors. Working condition criteria and classification.

Hazardous substance data sheet. Sodium chloride. Certificate No. AT-000435 – M: RPOKhV, 12.04.1995.
Hazardous substance data sheet. Neodymium(III) chloride. Certificate No. AT-004312 – M: RPOKhV, as of 24.12.2017.
Hazardous substance data sheet. Lead diacetate trihydrate. Certificate No. BT-005126 – M: RPOKhV, as of 24.12.2017.
Hazardous substance data sheet. Pentane-2,4-dione. Certificate No. BT-004767 – M: RPOKhV, as of 24.12.2017.
Norms of maximum allowable concentrations in water of fishery water bodies (Approved by Order of the Ministry of Agriculture of the Russian Federation No. 552 dd. December 13, 2016)".
"Uniform Sanitary and Epidemiological and Hygienic Requirements for Products Subject to Sanitary and Epidemiological Supervision (Control)" (Approved by Decision of the Customs Union Commission No. 299 dd. 28 May 2010), Chapter II, Section 19.
Single List of Goods Subject To Sanitary and Epidemiologic Supervision (Control) at the Customs Border and on the Customs Territory of the Customs, approved by Decision of the Customs Union Commission No. 299 dd. May 28, 2010.
PN ISO 11014-1:2008 Chemical Safety. Safety data sheet for chemical products.
Regulation (EC) No 1907/2006 – REACH concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency, amending the Directive 1999/45/EC and repealing the Council Regulation (EEC) No. 793/93 and the Commission Regulation (EC) No 1488/94, as well as the Council Directive 76/769/EEC and the Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council dd. 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing the Directives 67/548/EEC and 1999/45/EC, and amending the Regulation (EC) No. 1907/2006.
COMMISSION REGULATION (EC) No 790/2009 dd. August 10, 2009 amending, for the purposes of its adaptation to technical and scientific progress, the Regulation (EC) No. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
COMMISSION REGULATION (EU) No 453/2010 dd. May 20, 2010 amending the Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

16. SECTION 16: OTHER INFORMATION

16.1. Accepted Abbreviations

IUPAC	International Union of Pure and Applied Chemistry
CAS Number	Unique numerical identifier of chemical compounds, polymers, biological sequences of nucleotides or amino acids, mixtures and alloys assigned by the Register of Chemical Abstracts Service
EC Number	Number assigned by the EU Commission for the classification and labelling of hazardous substances
GOST	State standard adopted by the Interstate Council for Standardization, Metrology and Certification" (MGS)

16.2. Denial of responsibility

The information presented in this material safety data sheet is intended for the reagent kit characteristics in terms of the required safety regulations. It does not guarantee specific properties and is based on scientific evidences, as well as on regulatory and technical documentation known at the present. No obligation is provided.

16.3. Regulation of regulatory documents

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State standards and regulations that are referenced in this document are mandatory for use in the Russian Federation and their host countries, the Commonwealth of Independent States (CIS); in other countries these documents are recommendatory.

Prepared by:

Chief Process Engineer
LLC GLAUCON

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