



## SAFETY DATA SHEET

In accordance with the criteria of Regulation No 1907/2006 (REACH) as amended

### Methylammonium lead iodide

Date: 12.10.2021

Revision: -

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#### SECTION 1: Identification of the substance/mixture and of the company/undertaking

##### 1.1. Product identifier

Methylammonium lead iodide

**Product number:** MAPbI<sub>3</sub>

##### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Relevant identified uses:** Used for scientific research and development.

**Uses advised against:** Not specified.

##### 1.3. Details of the supplier of the safety data sheet

**Supplier:** NANOXO sp. z o.o.

**Address:** Poland; PL 01-224 Warszawa; Marcina Kasprzaka 44/52 Street

**Telephone:** +48 22 378 48 30

**E-mail address** of the person responsible for the SDS: info@nanoxo.eu

##### 1.4. Emergency telephone number

112 (emergency call)

#### SECTION 2: Hazards identification

##### 2.1. Classification of the substance or mixture

###### Classification according to Regulation 1272/2008/EC:

Acute Tox. 4; H302

Skin Irrit. 2; H315

Eye Irrit. 2; H319

Acute Tox. 4; H332

STOT SE 3; H335

Repr. 1A; H360Df

STOT RE 2; H373

Aquatic Acute 1; H400

Aquatic Chronic 1; H410

**Hazards to man:** Harmful if swallowed. Harmful if inhaled. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May damage the unborn child. Suspected of damaging fertility. May cause damage to organs through prolonged or repeated exposure.

**Hazards to environment:** Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

**Hazard from physical and chemical properties:** Does not meet the criteria of classification.

In section 16 stated the importance of H-phrases and symbols.

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**2.2. Label elements**

**Label accordance with Regulation 1272/2008/EC (CLP)**

**Hazard pictogram, signal words:**



**Danger**

**Hazard statements:**

- H302+H332 - Harmful if swallowed or if inhaled.
- H315 - Causes skin irritation.
- H319 - Causes serious eye irritation.
- H335 - May cause respiratory irritation.
- H360Df - May damage the unborn child. Suspected of damaging fertility.
- H373 - May cause damage to organs through prolonged or repeated exposure.
- H410 - Very toxic to aquatic life with long lasting effects.

**Precautionary statements:**

- P201 - Obtain special instructions before use.
- P202 - Do not handle until all safety precautions have been read and understood.
- P260 - Do not breathe dust.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- 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.
- P405 - Store locked up.

**The names of hazardous ingredients on the label:** Methylammonium iodide, Lead diiodide

**2.3. Other hazards**

The product does not meet the criteria for PBT or vPvB in accordance with Annex XIII of Regulation 1907/2006 (REACH).

The product does not contain ingredients entered in the list established in accordance with Art. 59 paragraph 1 as having endocrine disrupting properties or components with endocrine disrupting properties in accordance with the criteria set out in Regulation 2017/2100/EU or Regulation 2018/605/EU in a concentration equal to or greater than 0.1 %.

**SECTION 3: Composition/information on ingredients**

**3.1. Substances**

Not applicable.

**3.2. Mixtures**

<b>Substance name:</b>	<b>Methylammonium iodide*</b>
<b>Concentration [%]:</b>	<100**
Version 1	



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<b>CAS Number:</b>	14965-49-2
<b>EC Number:</b>	239-037-4
<b>Index Number:</b>	-
<b>Classification 1272/2008/EC:</b>	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Irrit. 2; H319 STOT SE 3; H335
<b>The registration number:</b>	Not applicable. The substance does not import more than 1 tonne per year (Article 6 (1) of Regulation 1907/2006 (REACH))

<b>Substance name:</b>	<b>Lead diiodide</b>
<b>Concentration [%]:</b>	<100**
<b>CAS Number:</b>	10101-63-0
<b>EC Number:</b>	233-256-9
<b>Index Number:</b>	082-001-00-6***
<b>Classification 1272/2008/EC:</b>	Repr. 1A; H360Df Acute Tox. 4; H332 Acute Tox. 4; H302 STOT RE 2; H373 Aquatic Acute 1; H400 (M=10) Aquatic Chronic 1; H410  Specific concentration limits (CLP): Repr. 2; H361f: C ≥ 2.5 % STOT RE 2; H373: C ≥ 0.5 %  Note A, 1
<b>The registration number:</b>	Not applicable. The substance does not import more than 1 tonne per year (Article 6 (1) of Regulation 1907/2006 (REACH))

\*Substance is not classified in Annex VI, Table 3.1 of Regulation 1272/2008. Classification of the manufacturer.

\*\*The total content of the substance is 100 %.

\*\*\*Lead compounds with the exception of those specified elsewhere in this Annex (Substance is not classified in Annex VI, Table 3.1 of Regulation 1272/2008).

**Note A:** Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4.

**Note 1:** The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture.

In section 16 stated the importance of H-phrases and symbols.



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#### SECTION 4: First aid measures

##### 4.1. Description of first aid measures

**Inhalation:** Move affected person to fresh air and keep at rest. Call a POISON CENTRE/doctor if you feel unwell.

**Skin contact:** Remove all contaminated clothing. Wash contaminated skin with water. If skin irritation occurs: Get medical advice/attention.

**Eye contact:** Remove any contact lenses. Flush eyes with a plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

**Ingestion:** Rinse mouth. Call a POISON CENTRE/doctor if you feel unwell.

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

May damage the unborn child. Suspected of damaging fertility. May cause damage to organs through prolonged or repeated exposure.

**Inhalation:** May cause respiratory irritation. Harmful if inhaled.

**Skin contact:** Causes skin irritation.

**Eye contact:** Causes serious eye irritation.

**Ingestion:** Harmful if swallowed.

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

Remove affected person from the environment contaminated by the product. In the event of health problems, consult your doctor or the center of toxicological concern. Provide the information contained in the SDS. If unconscious, do not give anything by mouth.

#### SECTION 5: Firefighting measures

##### 5.1. Extinguishing media

**Suitable extinguishing media:** Extinguishing media should be adapted to surrounding objects.

**Unsuitable extinguishing media:** Not specified.

##### 5.2. Special hazards arising from the substance or mixture

In case of fire hazardous products may be formed: e.g. carbon oxide. Avoid inhalation of combustion products, because they may pose a health risk.

##### 5.3. Advice for firefighters

Wear full protective equipment and self-contained breathing apparatus with independent air circulation. Containers exposed to fire or high temperature cool with water and if possible remove from the danger zone. Protect drains, surface waters and soil from pollution. Water from fire treated as hazardous pollution and accumulate in separate containers.

#### SECTION 6: Accidental release measures

##### 6.1. Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel:** Access of non-emergency personnel to the area of accident should be restricted until the completion of the disposal of the product. Wear appropriate personal protective equipment. Avoid contact with eyes and skin.

**For emergency responders:** Wear appropriate personal protective equipment. Avoid contact with eyes and skin.

##### 6.2. Environmental precautions

Secure the gullies. Prevent contamination of surface water and ground. In the event of any serious pollution of the environment, notify the appropriate administrative authority,



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control and rescue services. The used containers should be disposed by delivering to eligible organizations.

#### 6.3. Methods and material for containment and cleaning up

Secure damaged packaging. Collected product put in a substitute container and direct to the destruction or re-use.

#### 6.4. Reference to other sections

Disposal - see Section 13. Personal protective equipment - see Section 8.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Do not eat, drink, smoke or take drugs at work. Wash hands before breaks and after working with the product. Wear appropriate personal protective equipment. Take off contaminated clothing and wash before reuse. Ensure adequate ventilation at the workplace with the product. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.

#### 7.2. Conditions for safe storage, including any incompatibilities

Keep in properly labeled, factory sealed containers, with a label which complies with current regulations. Store in a well-ventilated place. Keep container tightly closed.

#### 7.3. Specific end use(s)

Used for scientific research and development.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

Not specified.

**Legal basis:** Ordinance on maximum permissible concentration and intensity of harmful factors in the work environment in accordance with national limit values.

EH40/2005 Workplace exposure limits, fourth edition, published 2020, ISBN 978 0 7176 6733 8.

**Monitoring procedures:** Use methods described in European Standards.

#### 8.2. Exposure controls

Mandatory general regulations on occupational health. Do not allow to exceed the normative concentrations of hazardous constituents in the workplace. After work, wash the body surface and clean the personal protective equipment. Do not eat, drink, smoke or take drugs at work. Wash hands and face during breaks and after working with the product.

**Eye/face protection:** Use appropriate safety glasses according to EN 166.

**Skin Protection:** Use suitable protective gloves in accordance with EN 374.

**Respiratory protection:** If work takes place in insufficient ventilation conditions, use suitable respiratory protection.

**Thermal Hazards:** Usually is not required.

Used personal protective equipment should meet the requirements of local/regional/national laws. The employer must provide personal protective equipment

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appropriate to the type of work and in accordance with all requirements, including maintenance and cleaning.

Concentrations of hazardous substances in the workplace should be monitored in accordance with acknowledged test methods. Mode, method, type and frequency of testing and measurement of harmful factors in the working environment should meet the requirements of local/regional/national laws.

**Environmental exposure controls:** The large amount of product should not be allowed to penetrate through the ground water, sewage, waste water or soil.

**SECTION 9: Physical and chemical properties**
**9.1. Information on basic physical and chemical properties**

<b>Physical state:</b>	Powder
<b>Colour:</b>	Not applicable
<b>Odour:</b>	Not applicable
<b>Melting point/freezing point:</b>	Not applicable
<b>Boiling point or initial boiling point and boiling range:</b>	Not applicable
<b>Flammability:</b>	Not applicable
<b>Lower and upper explosion limit:</b>	Not applicable
<b>Flash point:</b>	Not applicable
<b>Auto-ignition temperature:</b>	Not applicable
<b>Decomposition temperature:</b>	Not applicable
<b>pH:</b>	Not applicable
<b>Kinematic viscosity:</b>	Not applicable
<b>Solubility:</b>	Not applicable
<b>Partition coefficient n-octanol/water (log value):</b>	Not applicable
<b>Vapour pressure:</b>	Not applicable
<b>Density and/or relative density:</b>	Not applicable
<b>Relative vapour density:</b>	Not applicable
<b>Particle characteristics:</b>	Not applicable

**9.2. Other information**
**9.2.1. Information with regard to physical hazard classes**

Not specified.

**9.2.2. Other safety characteristics**

Not specified.

**SECTION 10: Stability and reactivity**
**10.1. Reactivity**

Not reactive under normal conditions of use and storage.

**10.2. Chemical stability**

Stable under normal conditions of storage.

**10.3. Possibility of hazardous reactions**

Not applicable.

**10.4. Conditions to avoid**

Not applicable.



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#### 10.5. Incompatible materials

Not applicable.

#### 10.6. Hazardous decomposition products

None under normal conditions of use and storage.

### SECTION 11: Toxicological information

#### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

**Acute toxicity:** Harmful if swallowed. Harmful if inhaled.

ATE<sub>mix</sub> (oral) > 300 mg/kg b.w. <2000 mg/kg b.w.

ATE<sub>mix</sub> (inhalation) > 1.0 mg/l < 5.0 mg/l

**Skin corrosion/irritation:** Causes skin irritation.

**Serious eye damage/irritation:** Causes serious eye irritation.

**Respiratory or skin sensitization:** Based on available data, the classification criteria are not met.

**Germ cell mutagenicity:** Based on available data, the classification criteria are not met.

**Carcinogenicity:** Based on available data, the classification criteria are not met.

**Reproductive toxicity:** May damage the unborn child. Suspected of damaging fertility.

**STOT - single exposure:** May cause respiratory irritation.

**STOT - repeated exposure:** May cause damage to organs through prolonged or repeated exposure.

**Aspiration hazard:** Based on available data, the classification criteria are not met.

#### 11.2. Information on other hazards

##### 11.2.1. Endocrine disrupting properties

Not specified.

##### 11.2.2. Other information

May damage the unborn child. Suspected of damaging fertility. May cause damage to organs through prolonged or repeated exposure.

**Inhalation:** May cause respiratory irritation. Harmful if inhaled.

**Skin contact:** Causes skin irritation.

**Eye contact:** Causes serious eye irritation.

**Ingestion:** Harmful if swallowed.

### SECTION 12: Ecological information

#### 12.1. Toxicity

Very toxic to aquatic life with long lasting effects.

#### 12.2. Persistence and degradability

Not specified.

#### 12.3. Bioaccumulative potential

Not specified.

#### 12.4. Mobility in soil

Not applicable.

#### 12.5. Results of PBT and vPvB assessment

Not applicable.

#### 12.6. Endocrine disrupting properties

Not specified.

#### 12.7. Other adverse effects

Not specified.



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#### SECTION 13: Disposal considerations

##### 13.1. Waste treatment methods

During removal of waste comply with the regional / national laws.

##### Community legislation:

- Directive **2008/98/EC** of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives as amended.
- European Parliament and Council Directive **94/62/EC** of 20 December 1994 on packaging and packaging waste as amended.

**Disposal methods for the product:** Do not introduce into the environment. Disposal in accordance with the local/national legislation.

**Disposal methods for used packing:** Empty containers give for appropriate rubbish dump or for disposal in accordance with the local/national legislation. Dispose of uncleanable containers like of the product.

#### SECTION 14: Transport information

	ADR	RID	AND	IMDG	ICAO TI
<b>14.1. UN number or ID number</b>	UN 2291				
<b>14.2. UN proper shipping name</b>	LEAD COMPOUND, SOLUBLE, N.O.S. (Lead diiodide)			LEAD COMPOUND, SOLUBLE, N.O.S. (Lead diiodide)	Lead compound, soluble, n.o.s. (Lead diiodide)
<b>14.3. Transport hazard class(es)</b>	6.1				
<b>14.4. Packing group</b>	III				
<b>14.5. Environmental hazards</b>	yes				no
<b>14.6. Special precautions for user</b>	Personal protective equipment should be used when handling the load - see section 8.				
<b>14.7. Maritime transport in bulk according to IMO instruments</b>	Not specified				

#### SECTION 15: Regulatory information

##### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

**Regulation (EC) No 1907/2006** of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC as amended.

**Regulation (EC) No 1272/2008** of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures,





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amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 as amended.

**Commission Regulation (EU) 2020/878** of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

**Directive 2008/98/EC** of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives as amended.

**European Parliament and Council Directive 94/62/EC** of 20 December 1994 on packaging and packaging waste as amended.

**Commission directive 2000/39/EC** of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

**Commission directive 2006/15/EC** of 7 February 2006 establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC.

**Commission directive 2009/161/EU** of 17 December 2009 establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC.

**Commission directive (EU) 2017/164** of 31 January 2017 establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU.

#### 15.2. Chemical safety assessment

The Chemical Safety Assessment has not been performed.

#### SECTION 16: Other information

##### The full text of H-statements from Sections 2 and 3:

H302 - Harmful if swallowed.

H315 - Causes skin irritation.

H319 - Causes serious eye irritation.

H332 - Harmful if inhaled.

H335 - May cause respiratory irritation.

H360Df - May damage the unborn child. Suspected of damaging fertility.

H373 - May cause damage to organs through prolonged or repeated exposure.

H400 - Very toxic to aquatic life.

H410 - Very toxic to aquatic life with long lasting effects.

#### Key to abbreviations and acronyms:

Acute Tox. 4 - Acute toxicity (oral, inhal.), Hazard Category 4.

Aquatic Acute 1 - Hazardous to the aquatic environment - Acute Hazard, Category 1.

Aquatic Chronic 1 - Hazardous to the aquatic environment - Chronic Hazard, Category 1.

ATE<sub>mix</sub> - Acute Toxicity Estimate for mixture.

BLV - Biological Limit Value.

Eye Irrit. 2 - Serious eye damage/eye irritation, Hazard Category 2.

Repr. 1A - Reproductive toxicity, Hazard Category 1A.

Skin Irrit. 2 - Skin corrosion/irritation, Hazard Category 2.

STEL - Short-Term Exposure Limit.

STOT RE 2 - Specific target organ toxicity - Repeated exposure, Hazard Category 2.

STOT SE 3 - Specific target organ toxicity - Single exposure, Hazard Category 3, Respiratory tract irritation.

TWA - Time Weighted Average.



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**Training advice:** Before use read the SDS.

**Sources of key data:**

Information provided electronically.

Database of the European Chemicals Agency (ECHA).

The information above is based on a current available data concerning the product, but also on the experience and knowledge in this field of the producer. They are neither a quality description of the product nor a guarantee of particular features. They are also treated as aid to safety in transport, storage and usage of the product. This does not free the user from the responsibility of improper usage of the information above also of improper compliance with the law norms in the field.

Prepared by ISOTOP s.c. Consulting Company; [www.isotop.pl](http://www.isotop.pl); e-mail: [reach@isotop.pl](mailto:reach@isotop.pl)

This SDS replaces and annuls all the previous versions.