

MATERIAL SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision number: 1

Revision date: 30/01/2019

1. Identification of the substance/mixture and of the company/undertaking**1.1. Product Details**

Product Code : M2106A
Product Name : Black phosphorus crystal
Full Name : Black phosphorus
REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration or the annual tonnage does not require a registration.
CAS No. : 7723-14-0

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

Identified uses : Laboratory chemicals

1.3. Supplier details

Supplied by : Ossila Limited
Solpro Business Park
Windsor Street, Sheffield
S4 7WB, UK
Telephone : 0114 2999 180
Email address : info@ossila.com

2. Hazards identification**2.1. Classification of the substance or mixture****Hazard statements according to Regulation (EC) 1272/2008**

Flammable solids (Category 1), H228

Chronic aquatic toxicity (Category 3), H412

2.2. Label elements**Labelling according Regulation (EC) No 1272/2008 [CLP]**

Signal word Danger
Hazard statement(s)
H228 Flammable solid.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.
No smoking.
P370 + P378 In case of fire: Use dry powder or dry sand to extinguish.

Supplemental information None.

2.3. Other hazards

None.

3. Composition/Information on ingredients

3.1. Substances

Synonyms: : Phosphorus, phosphorene
Formula : P
Molecular weight : 30.97 g/mol

Hazardous ingredients according to Regulation (EC) No 1272/2008

Component	CAS #	Weight %	CLP Classification
Black Phosphorus	7723-14-0	<=100%	Flam. Sol. 1 (H228); Aquatic Chronic 3 (H412)

4. First aid measures

4.1. Description of first aid measures

After Inhalation

If inhaled, remove to fresh air. If not breathing give artificial respiration. Call a physician.

After skin contact

In case of skin contact, wash with soap and flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

After eye contact

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

After Ingestion

If swallowed, wash out mouth with water. Call a physician.

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

The most important known symptoms and effects are described in section 11.

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

No data available.

5. Fire fighting

5.1. Extinguishing media

Suitable extinguishing media: Dry chemical, alcohol-resistant foam, carbon dioxide or water spray. Consult with local fire authorities before attempting large scale fire-fighting operations.

5.2. Special hazards arising from the substance of mixture

Hazardous combustion products: White phosphorus gas, oxides of phosphorus, phosphine, phosphoric acid (when water present).

5.3. Advice for firefighters

Wear a self-contained breathing apparatus if necessary. During a fire, irritating and highly toxic gases and vapours may be generated by thermal decomposition.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protective equipment (section 8). Avoid dust formation. Ensure room is well ventilated. Remove all sources of ignition.

6.2. Environmental precautions

Do not let product enter drains.

6.3. Containment and cleaning

Contain and clean up spill if safe to do so using an electrically protected vacuum cleaner or by wet-brushing. Dispose of dry waste in closed container for proper disposal according to local regulations.

7. Handling and storage

7.1. Precautions for safe handling

Avoid formation of dust and aerosols. Keep away from sources of ignition and avoid the build-up of electrostatic charge. Provide exhaust ventilation in places where dust is formed.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry and well-ventilated place inside of a tightly sealed container. Reseal containers that have been opened and keep upright to prevent leakage.

Quality-related information: Air, heat and moisture sensitive. Handle and store under inert gas.

7.3. Specific end uses

Use in laboratories.

8. Exposure controls / Personal protection

8.1. Control parameters

Contains no substances with occupational exposure limit values.

Biological occupational exposure limits

This product does not contain any hazardous materials with biological limits.

8.2. Exposure controls

Engineering measures

Handle in accordance with good industrial engineering/laboratory practices for hygiene and safety. Ensure eyewash stations and safety showers are close to the laboratory workstation. Ensure good general ventilation is present when handling the product.

Personal protective equipment

Eyes: Wear safety glasses with side-shields conforming to appropriate government standards such as NOISH (US) or EN166 (EU).

Skin: Handle with appropriate gloves and use proper glove removal technique to avoid skin contact. Dispose of gloves in accordance with applicable laws. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Clothing: Wear complete suit protecting against chemicals; the type of equipment should be appropriate for the concentration and amount of dangerous substance used.

Respirators: Where protection from nuisance dusts is needed, use type N95 (US) or type P1 (EN 143) dust masks. Use multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. Respirators should be approved under appropriate government standards such as NIOSH (US) or CEN (EU).

General hygiene measures

Wash thoroughly after handling. Wash contaminated clothing before reuse.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	:	Solid grey/black crystal
Odour	:	No data available
Odour threshold	:	No data available
pH	:	No data available
Melting/freezing point	:	416 °C
Boiling point/range	:	No data available
Flash point	:	No data available
Evaporation rate	:	No data available
Flammability	:	No data available
Explosive limits	:	No data available
Vapour pressure	:	No data available
Vapour density	:	No data available
Relative density	:	No data available
Solubility(ies)	:	No data available
Partition coefficient: <i>n</i> -octanol/water	:	No data available
Autoignition temperature	:	> 300 °C at 1,013 hPa
Decomposition temperature	:	No data available
Viscosity	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available

9.2. Other safety information

No data available.

10. Stability and reactivity

10.1 Reactivity

No data available.

10.2. Chemical stability

Stable under normal temperatures and pressures under recommended storage conditions.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Heat, flames, sparks and friction.

10.5. Incompatible materials

Strong oxidising agents.

10.6. Hazardous decomposition products

No known hazardous decomposition products.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/eye irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available.

Specific target organ toxicity - single exposure

No data available.

Specific target organ toxicity - repeated exposure

No data available.

Aspiration hazard

No data available.

Routes of exposure

Eye contact, ingestion, inhalation, skin contact.

Signs and Symptoms of Exposure

Skin: inflammation (redness, swelling, itching and pain). Eyes: inflammation, tearing, impaired vision and pain.

Inhalation: cough, nose and throat pain.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. Ecological information

12.1. Toxicity

Toxicity

No data available.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

No data available.

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6. Other adverse effects

Harmful to aquatic life with long lasting effects.

13. Disposal

13.1. Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations and directives on waste and hazardous waste. Offer surplus material to a licensed professional waste disposal professional.

Contaminated packaging

Dispose of as unused product.

14. Transport

14.1. UN number

ADR/RID:	1338	IMDG:	1338	IATA:	1338
----------	------	-------	------	-------	------

14.2. UN proper shipping name

ADR/RID:	PHOSPHORUS, AMORPHOUS
IMDG:	PHOSPHORUS, AMORPHOUS
IATA:	PHOSPHORUS, AMORPHOUS

Special Provisions: "Keep away from heat" label required.

14.3. Transport hazard class

ADR/RID:	4.1	IMDG:	4.1	IATA:	4.1
----------	-----	-------	-----	-------	-----

14.4. Packaging group

ADR/RID:	III	IMDG:	III	IATA:	III
----------	-----	-------	-----	-------	-----

14.5. Environmental hazards

ADR/RID:	yes	IMDG Marine pollutant:	yes	IATA:	no
----------	-----	------------------------	-----	-------	----

14.6. Special precautions for user

No special precautions required.

15. Regulatory information

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006, the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

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

No data available.

15.2 Chemical safety assessment

No chemical safety report/assessment was carried out for this product.

16. Other information

Warranty

This material is for research and development use only. The information provided here is based upon the available information from material suppliers but not warranted as complete and is provided only as a guide. Ossila Limited shall not be held responsible for any damage resulting from use or handling of this product.