

(1,5-cyclooctadiene)iridium(I) chloride dimer

## Section 1. Identification

Code: C2016

GHS product identifier: (1,5-cyclooctadiene)iridium(I) chloride dimer

Chemical name: di- $\mu$ -chlorobis[(1,2,5,6- $\eta$ )cycloocta-1,5-diene]diiridiumOther means of identification: di-.mu.-chlorobis[(1,2,5,6-.eta.)cycloocta-1,5-diene]diiridium; [IrCl(cod)]<sub>2</sub>

Product type: Solid.

Relevant identified uses of the substance or mixture and uses advised against:

### Identified uses

Use in laboratories

Supplier's details: Johnson Matthey, 2001 Nolte Drive, West Deptford, NJ 08066 USA

Emergency telephone number (with hours of operation): For Hazardous Materials [or Dangerous Goods] Incident, Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night (collect calls accepted).

Within USA and Canada: 1-800-424-9300. Outside USA and Canada: +1 703-527-3887

## Section 2. Hazards identification

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture COMBUSTIBLE DUSTS

### GHS label elements

Signal word **Warning**

Hazard statements May form combustible dust concentrations in air.

### Precautionary statements

Prevention Use explosion-proof electrical, ventilating, lighting and all material-handling equipment.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Supplemental label elements Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Prevent dust accumulation.

Hazards not otherwise classified May form explosible dust-air mixture if dispersed.

## Section 3. Composition/information on ingredients

Substance/mixture Substance

Chemical name di- $\mu$ -chlorobis[(1,2,5,6- $\eta$ )cycloocta-1,5-diene]diiridiumOther means of identification di-.mu.-chlorobis[(1,2,5,6-.eta.)cycloocta-1,5-diene]diiridium; [IrCl(cod)]<sub>2</sub>

### CAS number/other identifiers

CAS number 12112-67-3

Product code C2016

Ingredient name	%	CAS number
di- $\mu$ -chlorobis[(1,2,5,6- $\eta$ )cycloocta-1,5-diene]diiridium	100	12112-67-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

Eye contact	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin contact	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

Eye contact	No known significant effects or critical hazards.
Inhalation	No known significant effects or critical hazards.
Skin contact	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

Eye contact	No specific data.
Inhalation	No specific data.
Skin contact	No specific data.
Ingestion	No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

Suitable extinguishing media	Use dry chemical powder.
Unsuitable extinguishing media	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.

Specific hazards arising from the chemical Flammable solid. May form explosible dust-air mixture if dispersed.

Hazardous thermal decomposition products	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds metal oxide/oxides
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Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 5. Fire-fighting measures

- Remark** Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.
- Remark** Material in powder form, capable of creating a dust explosion. St2

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Small spill** Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. May form explosible dust-air mixture if dispersed. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

di- $\mu$ -chlorobis[(1,2,5,6- $\eta$ )cycloocta-1,5-diene]diiridium None.

- Appropriate engineering controls** The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

## Section 8. Exposure controls/personal protection

**Environmental exposure controls** Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

**Hygiene measures** Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

### Skin protection

**Hand protection** Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Other skin protection** Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties

<b>Physical state</b>	Solid. [Crystalline powder.]	<b>Melting point</b>	Not available.
<b>Color</b>	Orange. Red.	<b>Boiling point</b>	Not available.
<b>Odor</b>	Not available.	<b>Flash point</b>	Not available.
<b>Odor threshold</b>	Not available.	<b>Burning time</b>	Not available.
<b>Vapor pressure</b>	Not available.	<b>Burning rate</b>	Not available.
<b>Vapor density</b>	Not available.	<b>Flammability (solid, gas)</b>	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.
<b>Evaporation rate</b>	Not available.	<b>Lower and upper explosive (flammable) limits</b>	Not available.
<b>Relative density</b>	Not available.	<b>Auto-ignition temperature</b>	Not available.
<b>pH</b>	Not available.	<b>Decomposition temperature</b>	Not available.
<b>Partition coefficient: n-octanol/water</b>	Not available.	<b>SADT</b>	Not available.
<b>Solubility in water</b>	Not available.	<b>Viscosity</b>	Not available.

## Section 9. Physical and chemical properties

**Solubility** Very slightly soluble in the following materials: acetone.  
Insoluble in the following materials: cold water.

## Section 10. Stability and reactivity

**Reactivity** No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** The product is stable.

**Possibility of hazardous reactions** Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation.

**Incompatible materials** Reactive or incompatible with the following materials:  
oxidizing materials

**Hazardous decomposition products** Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Not available.

**Conclusion/Summary** Not available.

#### Irritation/Corrosion

Not available.

**Skin** Not available.

**Eyes** Not available.

**Respiratory** Not available.

#### Sensitization

Not available.

**Skin** Not available.

**Respiratory** Not available.

#### Mutagenicity

Not available.

**Conclusion/Summary** Not available.

#### Carcinogenicity

Not available.

**Conclusion/Summary** Not available.

#### Reproductive toxicity

Not available.

**Conclusion/Summary** Not available.

#### Teratogenicity

Not available.

**Conclusion/Summary** Not available.

#### Specific target organ toxicity (single exposure)

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

## Section 11. Toxicological information

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** Routes of entry anticipated: Dermal, Inhalation.

### Potential acute health effects

Eye contact	No known significant effects or critical hazards.
Inhalation	No known significant effects or critical hazards.
Skin contact	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	No specific data.
Inhalation	No specific data.
Skin contact	No specific data.
Ingestion	No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

#### Long term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

### Potential chronic health effects

Not available.

Conclusion/Summary	Not available.
General	No known significant effects or critical hazards.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

Interactive effects Not available.

Other information Not available.

## Section 12. Ecological information

### Toxicity

Not available.

Conclusion/Summary Not available.

### Persistence and degradability

Not available.

Conclusion/Summary Not available.

### Bioaccumulative potential

Not available.

### Mobility in soil

Soil/water partition coefficient ( $K_{oc}$ )	Not available.
Mobility	Not available.



## Section 12. Ecological information

**Other adverse effects** No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Waste stream** Not available.

**RCRA classification** Not available.

## Section 14. Transport information

	<b>DOT Classification</b>	<b>IMDG</b>	<b>IATA</b>
<b>UN number</b>	Not regulated.	Not regulated.	Not regulated.
<b>UN proper shipping name</b>	-	-	-
<b>Transport hazard class(es) and Packing group</b>	--	--	--
<b>Environmental hazards</b>	No.	No.	No.
<b>Additional information</b>	-	-	-

**Special precautions for user** **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL and the IBC Code** Not available.

**Proper shipping name** Not available.

**Ship type** Not available.

**Pollution category** Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined  
**United States inventory (TSCA 8b):** This material is not listed.

**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** Not listed

**Clean Air Act Section 602 Class I Substances** Not listed

**Clean Air Act Section 602 Class II Substances** Not listed

**DEA List I Chemicals (Precursor Chemicals)** Not listed

**DEA List II Chemicals (Essential Chemicals)** Not listed

### SARA 302/304

**Composition/information on ingredients**

No products were found.

**SARA 304 RQ** Not applicable.

## Section 15. Regulatory information

### SARA 311/312

Classification Fire hazard

### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
di- $\mu$ -chlorobis[(1,2,5,6- $\eta$ )cycloocta-1,5-diene]diiridium	100	Yes.	No.	No.	No.	No.

### State regulations

Massachusetts This material is not listed.

New York This material is not listed.

New Jersey This material is not listed.

Pennsylvania This material is not listed.

Not available.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol (Annexes A, B, C, E)

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### International lists

#### National inventory

Australia Not determined.

Canada Not determined.

China Not determined.

Europe This material is listed or exempted.

Japan **Japan inventory (ENCS):** Not determined.

**Japan inventory (ISHL):** Not determined.

Malaysia Not determined.

New Zealand Not determined.

Philippines Not determined.

Republic of Korea Not determined.

Taiwan This material is listed or exempted.

Turkey Not determined.

## Section 16. Other information

### Procedure used to derive the classification

Classification	Justification
COMBUSTIBLE DUSTS	Expert judgment

### History

Date of printing 10/01/2017



## Section 16. Other information

Date of issue/Date of revision	10/01/2017
Date of previous issue	29/11/2016
Version	4
Prepared by	Not available.
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
References	Not available.

Indicates information that has changed from previously issued version.

US Label (29 CFR 1910.1200(f)(1))

<p><b>(1,5-cyclooctadiene)iridium(I) chloride dimer</b></p> <p>CAS: 12112-67-3      Code: C2016</p> <p><b>Warning</b></p> <p>May form combustible dust concentrations in air.</p> <p>Use explosion-proof electrical, ventilating, lighting and all material-handling equipment.</p> <p>Supplemental label elements: Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Prevent dust accumulation. Read SDS before using this product. Do not handle until all safety precautions have been read and understood.</p> <p>Johnson Matthey 2001 Nolte Drive, West Deptford, NJ 08066 USA non-emergencies: +1 856 384 7050; emergencies +1 800 424 9300</p>
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