

Creation Date 16-Nov-2010

Revision Date 04-Oct-2023

Revision Number 8

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

Product Description: Bis(1,5-cyclooctadiene)rhodium(I) tetrafluoroborate  
Cat No. : RH2527  
CAS No 35138-22-8  
EC No 460-220-1  
Molecular Formula C16 H24 B F4 Rh

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

Recommended Use Laboratory chemicals.  
Uses advised against No Information available

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

Company  
Stanford Advanced Materials  
23661 Birtcher Dr. Lake Forest,  
CA 92630 USA  
Tel: (949) 407-8904

1.4. Emergency telephone number Tel: (949) 407-8904

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

#### **Physical hazards**

Flammable solids Category 1 (H228)  
Substances/mixtures corrosive to metal Category 1 (H290)

#### **Health hazards**

Based on available data, the classification criteria are not met

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## Environmental hazards

Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

## 2.2. Label elements



Signal Word

Danger

## Hazard Statements

H290 - May be corrosive to metals

H228 - Flammable solid

May form combustible dust concentrations in air

## Precautionary Statements

P390 - Absorb spillage to prevent material damage

P234 - Keep only in original packaging

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

## 2.3. Other hazards

May form explosible dust-air mixture if dispersed

This product does not contain any known or suspected endocrine disruptors

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

| Component  | CAS No     | EC No     | Weight % | CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567 |
|--|------------|-----------|----------|---|
| bis(1,5-Cyclooctadiene)rhodium (I) tetrafluoroborate | 35138-22-8 | 460-220-1 | >95      | Flam. Sol. 1 (H228)<br>Met. Corr. 1 (H290)  |

Full text of Hazard Statements: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

General Advice

Immediate medical attention is required. Show this safety data sheet to the doctor in

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|   |   |
|---|---|
|   | attendance.   |
| <b>Eye Contact</b>                        | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.         |
| <b>Skin Contact</b>                       | Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur. |
| <b>Ingestion</b>                          | Do NOT induce vomiting. Get medical attention.  |
| <b>Inhalation</b>                         | Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately if symptoms occur.       |
| <b>Self-Protection of the First Aider</b> | Remove all sources of ignition.   |

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

No information available.

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

**Notes to Physician** Treat symptomatically.

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing media

#### **Suitable Extinguishing Media**

Water spray, carbon dioxide (CO<sub>2</sub>), dry chemical, alcohol-resistant foam.

#### **Extinguishing media which must not be used for safety reasons**

No information available.

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

Flammable. Containers may explode when heated. This material poses an explosion hazard. Fine dust dispersed in air may ignite.

#### **Hazardous Combustion Products**

Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), Hydrogen fluoride, Oxides of boron.

### 5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

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

Use personal protective equipment as required. Avoid dust formation. Remove all sources of ignition. Take precautionary measures against static discharges.

### 6.2. Environmental precautions

Should not be released into the environment. See Section 12 for additional Ecological Information.

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

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Sweep up and shovel into suitable containers for disposal. Avoid dust formation. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

## 6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation. Avoid dust formation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

### **Hygiene Measures**

When using do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing.

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

Flammables area. Keep away from heat, sparks and flame. Keep container tightly closed in a dry and well-ventilated place. Keep refrigerated. Keep under nitrogen.

**Technical Rules for Hazardous Substances (TRGS) 510**      Class 4.1B  
**Storage Class (LGK) (Germany)**

### 7.3. Specific end use(s)

Use in laboratories

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

#### **Exposure limits**

List source(s):

#### **Biological limit values**

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

#### **Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)**

No information available

#### **Predicted No Effect Concentration (PNEC)**

No information available.

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## 8.2. Exposure controls

### Engineering Measures

Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting equipment.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

### Personal protective equipment

**Eye Protection** Goggles (European standard - EN 166)

**Hand Protection** Protective gloves

| Glove material | Breakthrough time | Glove thickness | EU standard | Glove comments        |
|----------------|-------------------|-----------------|-------------|-----------------------|
| Natural rubber | See manufacturers | -               | EN 374      | (minimum requirement) |
| Nitrile rubber | recommendations   |                 |             |                       |
| Neoprene       |                   |                 |             |                       |
| PVC            |                   |                 |             |                       |

**Skin and body protection** Wear appropriate protective gloves and clothing to prevent skin exposure.

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.

(Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

**Respiratory Protection** When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.  
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

**Large scale/emergency use** Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced  
**Recommended Filter type:** Particulates filter conforming to EN 143

**Small scale/Laboratory use** Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.  
**Recommended half mask:-** Particle filtering: EN149:2001  
When RPE is used a face piece Fit Test should be conducted

**Environmental exposure controls** No information available.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

|                                 |                          |       |
|---------------------------------|--------------------------|-------|
| <b>Physical State</b>           | Solid                    |       |
| <b>Appearance</b>               | Red                      |       |
| <b>Odor</b>                     | aromatic                 |       |
| <b>Odor Threshold</b>           | No data available        |       |
| <b>Melting Point/Range</b>      | 210 °C / 410 °F          |       |
| <b>Softening Point</b>          | No data available        |       |
| <b>Boiling Point/Range</b>      | No information available |       |
| <b>Flammability (liquid)</b>    | Not applicable           | Solid |
| <b>Flammability (solid,gas)</b> | No information available |       |
| <b>Explosion Limits</b>         | No data available        |       |

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|   |                          |                                   |
|---|--------------------------|-----------------------------------|
| Flash Point                             | No information available | Method - No information available |
| Autoignition Temperature                | No data available        |                                   |
| Decomposition Temperature               | 210 °C                   |                                   |
| pH                                      | No information available |                                   |
| Viscosity                               | Not applicable           | Solid                             |
| Water Solubility                        | Insoluble                |                                   |
| Solubility in other solvents            | No information available |                                   |
| Partition Coefficient (n-octanol/water) |                          |                                   |
| Vapor Pressure                          | No data available        |                                   |
| Density / Specific Gravity              | No data available        |                                   |
| Bulk Density                            | No data available        |                                   |
| Vapor Density                           | Not applicable           | Solid                             |
| Particle characteristics                | No data available        |                                   |

## 9.2. Other information

|                   |  |
|-------------------|--|
| Molecular Formula | C16 H24 B F4 Rh  |
| Molecular Weight  | 406.08   |
| Flammable solids  | Burning rate or burning time = > 2.2 mm/s or < 45 secs<br>Wetted zone passed - Yes |
| Evaporation Rate  | Not applicable - Solid   |

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

Yes

### 10.2. Chemical stability

Hygroscopic. heat sensitive. Air sensitive.

### 10.3. Possibility of hazardous reactions

**Hazardous Polymerization** Hazardous polymerization does not occur.  
**Hazardous Reactions** None under normal processing.

### 10.4. Conditions to avoid

Incompatible products. Excess heat. Avoid dust formation. Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Exposure to moisture.

### 10.5. Incompatible materials

Strong oxidizing agents. Acids. Bases.

### 10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Hydrogen fluoride. Oxides of boron.

## SECTION 11: TOXICOLOGICAL INFORMATION

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

#### Product Information

#### (a) acute toxicity;

|            |  |
|------------|--|
| Oral       | Based on available data, the classification criteria are not met |
| Dermal     | No data available  |
| Inhalation | No data available  |

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| Component  | LD50 Oral         | LD50 Dermal | LC50 Inhalation |
|--|-------------------|-------------|-----------------|
| bis(1,5-Cyclooctadiene)rhodium (I) tetrafluoroborate | >2000 mg/kg (Rat) | -           | -               |

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;  
Respiratory No data available  
Skin No data available

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available  
There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; No data available  
Target Organs No information available.

(j) aspiration hazard; Not applicable  
Solid

Other Adverse Effects The toxicological properties have not been fully investigated.

Symptoms / effects, both acute and delayed No information available.

## 11.2. Information on other hazards

**Endocrine Disrupting Properties** Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

## SECTION 12: ECOLOGICAL INFORMATION

**12.1. Toxicity**  
Ecotoxicity effects Do not empty into drains.

**12.2. Persistence and degradability**  
Persistence Insoluble in water.

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|   |  |
|---|--|
| <b>12.3. Bioaccumulative potential</b>  | May have some potential to bioaccumulate   |
| <b>12.4. Mobility in soil</b>   | Is not likely mobile in the environment due its low water solubility.  |
| <b>12.5. Results of PBT and vPvB assessment</b>   | No data available for assessment.  |
| <b>12.6. Endocrine disrupting properties</b><br><b>Endocrine Disruptor Information</b>                        | This product does not contain any known or suspected endocrine disruptors  |
| <b>12.7. Other adverse effects</b><br><b>Persistent Organic Pollutant</b><br><b>Ozone Depletion Potential</b> | This product does not contain any known or suspected substance<br>This product does not contain any known or suspected substance |

## SECTION 13: DISPOSAL CONSIDERATIONS

|  |  |
|--|--|
| <b>13.1. Waste treatment methods</b>       |  |
| <b>Waste from Residues/Unused Products</b> | Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations. |
| <b>Contaminated Packaging</b>              | Dispose of this container to hazardous or special waste collection point.  |
| <b>European Waste Catalogue (EWC)</b>      | According to the European Waste Catalog, Waste Codes are not product specific, but application specific.   |
| <b>Other Information</b>                   | Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains.  |

## SECTION 14: TRANSPORT INFORMATION

### IMDG/IMO

|   |  |
|---|--|
| <b>14.1. UN number</b>                  | UN2925   |
| <b>14.2. UN proper shipping name</b>    | Flammable solid, corrosive, organic, n.o.s.          |
| <b>Technical Shipping Name</b>          | bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate |
| <b>14.3. Transport hazard class(es)</b> | 4.1  |
| <b>Subsidiary Hazard Class</b>          | 8  |
| <b>14.4. Packing group</b>              | II   |

### ADR

|   |  |
|---|--|
| <b>14.1. UN number</b>                  | UN2925   |
| <b>14.2. UN proper shipping name</b>    | Flammable solid, corrosive, organic, n.o.s.          |
| <b>Technical Shipping Name</b>          | bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate |
| <b>14.3. Transport hazard class(es)</b> | 4.1  |
| <b>Subsidiary Hazard Class</b>          | 4.1, 8   |
| <b>14.4. Packing group</b>              | II   |

### IATA

ACR37565



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**14.1. UN number** UN2925  
**14.2. UN proper shipping name** Flammable solid, corrosive, organic, n.o.s.  
**Technical Shipping Name** bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate  
**14.3. Transport hazard class(es)** 4.1  
**Subsidiary Hazard Class** 8  
**14.4. Packing group** II

**14.5. Environmental hazards** No hazards identified  
**14.6. Special precautions for user** No special precautions required.  
**14.7. Maritime transport in bulk according to IMO instruments** Not applicable, packaged goods

## SECTION 15: REGULATORY INFORMATION

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

#### International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

| Component  | CAS No     | EINECS | ELINCS    | NLP | IECSC | TCSI | KECL | ENCS | ISHL |
|--|------------|--------|-----------|-----|-------|------|------|------|------|
| bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate | 35138-22-8 | -      | 460-220-1 | -   | -     | X    | -    | -    | -    |

| Component  | CAS No     | TSCA | TSCA Inventory notification - Active-Inactive | DSL | NDSL | AICS | NZIoC | PICCS |
|--|------------|------|---|-----|------|------|-------|-------|
| bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate | 35138-22-8 | -    | -   | -   | -    | -    | -     | -     |

**Legend:** X - Listed '-' - Not Listed **KECL** - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

**Authorisation/Restrictions according to EU REACH** Not applicable

| Component  | CAS No     | REACH (1907/2006) - Annex XIV - Substances Subject to Authorization | REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances | REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC) |
|--|------------|---|---|---|
| bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate | 35138-22-8 | -   | -   | -   |

#### Seveso III Directive (2012/18/EC)

| Component  | CAS No     | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements |
|--|------------|---|--|
| bis(1,5-Cyclooctadiene)rhodium (i) tetrafluoroborate | 35138-22-8 | Not applicable  | Not applicable   |

**Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals**  
 Not applicable

**Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?**  
 Not applicable

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Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

## National Regulations

**UK** - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

**WGK Classification** Water endangering class = 3 (self classification)

## 15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

## SECTION 16: OTHER INFORMATION

### Full text of H-Statements referred to under sections 2 and 3

H228 - Flammable solid

H290 - May be corrosive to metals

### Legend

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**IECSC** - Chinese Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**ENCS** - Japanese Existing and New Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

**WEL** - Workplace Exposure Limit

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DNEL** - Derived No Effect Level

**RPE** - Respiratory Protective Equipment

**LC50** - Lethal Concentration 50%

**NOEC** - No Observed Effect Concentration

**PBT** - Persistent, Bioaccumulative, Toxic

**TWA** - Time Weighted Average

**IARC** - International Agency for Research on Cancer Predicted No Effect Concentration (PNEC)

**LD50** - Lethal Dose 50%

**EC50** - Effective Concentration 50%

**POW** - Partition coefficient Octanol:Water

**vPvB** - very Persistent, very Bioaccumulative

**ADR** - European Agreement Concerning the International Carriage of Dangerous Goods by Road

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

**OECD** - Organisation for Economic Co-operation and Development

**BCF** - Bioconcentration factor

### Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**ATE** - Acute Toxicity Estimate

**VOC** - (Volatile Organic Compound)

### Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

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Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

|                  |                 |
|------------------|-----------------|
| Creation Date    | 16-Nov-2010     |
| Revision Date    | 04-Oct-2023     |
| Revision Summary | Not applicable. |

**This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.**

## Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of Safety Data Sheet**