Rh-50, Acetylacetonatodicarbonyl Rhodium (I)

SAFETY DATA SHEET

Product code : 209050

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

1.1 Product identifier

Product name : Rh-50, Acetylacetonatodicarbonyl Rhodium (I)
EC number : 238-947-9
CAS number : 14874-82-9
Product code : 209050
Product description : Not available.
Product type : Solid.
Other means of identification : dicarbonyl(pentane-2,4-dionato-o,o')rhodium
Chemical formula : C7H7O4Rh

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

Not applicable.

1.3 Details of the supplier of the safety data sheet

Johnson Matthey Plc,
Orchard Road,
Royston,
Herts SG8 5HE

e-mail address of person responsible for this SDS : EHS_CCR@matthey.com

1.4 Emergency telephone number

Supplier
Telephone number : +44(0)1763253000
Hours of operation : 24 hours

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mono-constituent substance
Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
Flam. Sol. 2, H228
Acute Tox. 3, H301
Eye Irrit. 2, H319
Skin Sens. 1, H317
Aquatic Chronic 3, H412

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Classification according to Directive 67/548/EEC [DSD]
F: R11
T: R25
Xi: R36
R43
R52/53

Date of issue/Date of revision : 16/07/2015.
Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - United Kingdom (UK)
Rh-50, Acetylacetonatodichlororhodium (I)

SECTION 2: Hazards identification

See Section 16 for the full text of the R phrases or H statements declared above.
See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements
Hazard pictograms:

Signal word: Danger
Hazard statements:
- Flammable solid.
- Toxic if swallowed.
- Causes serious eye irritation.
- May cause an allergic skin reaction.
- Harmful to aquatic life with long lasting effects.

Precautionary statements
Prevention:
- Wear protective gloves or clothing and eye or face protection. Keep away from heat, sparks and hot surfaces. - No smoking.

Response:
- IF IN EYES: Rinse cautiously with water for several minutes. Get medical attention.

Storage:
- Store locked up.

Disposal:
- Not applicable.

Hazardous ingredients:
dicarbonylpentane-2,4-dionato-O,O'rhodium

Supplemental label elements
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles:
- Not applicable.

Special packaging requirements
- Containers to be fitted with child-resistant fastenings:
- Tactile warning of danger:
- Not applicable.

2.3 Other hazards
Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII:
P: Not available. B: Not available. T: No.

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII:
Not available.

Other hazards which do not result in classification:
None known.
SECTION 3: Composition/information on ingredients

3.1 Substances : Mono-constituent substance

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Identifiers</th>
<th>%</th>
<th>Classification</th>
</tr>
</thead>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type
[A] Constituent
[B] Impurity
[C] Stabilising additive

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

SECTION 4: First aid measures

4.1 Description of 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.

**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 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**
Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. In the event of any complaints or symptoms, avoid further exposure. Clean shoes thoroughly before reuse.

**Ingestion**
Get medical attention immediately. Call a poison center or physician. 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. 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.

**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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

**Potential acute health effects**

**Eye contact**
Causes serious eye irritation.
## SECTION 4: First aid measures

<table>
<thead>
<tr>
<th>Over-exposure signs/symptoms</th>
<th>Inhalation</th>
<th>Skin contact</th>
<th>Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No known significant effects or critical hazards.</td>
<td>May cause an allergic skin reaction.</td>
<td>Toxic if swallowed. Irritating to mouth, throat and stomach.</td>
</tr>
</tbody>
</table>

### Notes to physician

**Specific treatments**

**Inhalation**: No known significant effects or critical hazards.  
**Ingestion**: Toxic if swallowed. Irritating to mouth, throat and stomach.  

### Over-exposure signs/symptoms

**Eye contact**: Adverse symptoms may include the following:
- Pain or irritation
- Watering
- Redness

**Inhalation**: No specific data.

**Skin contact**: Adverse symptoms may include the following:
- Irritation
- Redness

**Ingestion**: No specific data.

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

**Notes to physician**: No specific treatment.

### SECTION 5: Firefighting measures

**5.1 Extinguishing media**

**Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.

**Unsuitable extinguishing media**: Do not use water jet.

**5.2 Special hazards arising from the substance or mixture**

**Hazard from the substance or mixture**: Flammable solid. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**: Decomposition products may include the following materials:
- Carbon dioxide
- Carbon monoxide
- Metal oxide/oxides

**5.3 Advice for firefighters**

**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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

**Additional information**: Risk of explosion if heated under confinement.

**Remark**: The residue, ash or char left after a fire may have catalytic properties and may promote the re-ignition of flammable materials and vapours.
SECTION 6: Accidental release measures

6.1 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 spilt 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 specialised 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".

6.2 Environmental precautions:
- Avoid dispersal of spilt 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). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up

Small spill:
- Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Do not dry sweep.
- Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container.
- Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill:
- Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind.
- Prevent entry into sewers, water courses, basements or confined areas.
- Avoid dust generation. Do not dry sweep.
- Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections
- See Section 1 for emergency contact information.
- See Section 8 for information on appropriate personal protective equipment.
- See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures:
- Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used.
- Do not get in eyes or on skin or clothing. Do not ingest.
- Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate.
- Do not enter storage areas and confined spaces unless adequately ventilated.
- Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use.
- Store and use away from heat, sparks, open flame or any other ignition source.
- Use only non-sparking tools.
- 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.

7.2 Conditions for safe storage, including any incompatibilities
SECTION 7: Handling and storage

Store in accordance with local regulations. Store in a segregated and approved area. Store in original containers protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. 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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Seveso II Directive - Reporting thresholds (in tonnes)

<table>
<thead>
<tr>
<th>Danger criteria</th>
<th>Notification and MAPP threshold</th>
<th>Safety report threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2: Toxic</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
<td>C7b: Highly flammable (R11)</td>
<td>5000</td>
<td>50000</td>
</tr>
</tbody>
</table>

7.3 Specific end use(s)

Recommendations: Not available.

Industrial sector specific solutions: Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker or exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Exposure limit values</th>
</tr>
</thead>
<tbody>
<tr>
<td>dicarbonyl(pentane-2,4-dionato-O,O')rhodium</td>
<td>EH40-OES (United Kingdom (UK)). TWA: 0.1 mg/m³ 8 hours. Form: Dust and fumes As Rh</td>
</tr>
</tbody>
</table>

Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available.

8.2 Exposure controls

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures
SECTION 8: Exposure controls/personal protection

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. Contaminated work clothing should not be allowed out of the workplace. 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: chemical splash goggles.

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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.

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: Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: multi-gas/vapour filter. Not recommended: disposable particulate mask, particulate filter.

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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state: Solid. [Crystals.]
Colour: Green.
Odour: Pungent. [Strong]
Odour threshold: Not available.

pH: Not available.

Melting point/freezing point: Sublimation temperature: 50°C
Initial boiling point and boiling range: Not available.
Flash point: Not applicable.
Evaporation rate: Not available.
Flammability (solid, gas): Not applicable.
Upper/lower flammability or explosive limits: Not available.
Vapour pressure: Not available.
SECTION 9: Physical and chemical properties

Vapour density: Not available.
Relative density: Not available.
Solubility(ies): Soluble in the following materials: acetone.
Partially soluble in the following materials: methanol.
Insoluble in the following materials: cold water.
Partition coefficient: n-octanol/water: Not available.
Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Not applicable.
Explosive properties: Risk of explosion if heated under confinement.
Oxidising properties: Not available.
Minimum ignition energy (mJ): Not available.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

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

10.2 Chemical stability: The catalytic properties of this material may give it a low ignition temperature (except when supplied as a paste). The catalytic properties will also promote the oxidation and possible ignition of flammable liquids and vapours. A used, filtered catalyst should, therefore, be kept wet and out of contact with combustible vapours and liquids. The material is supplied in a stable condition and other than the previously mentioned catalytic hazards of this material, no specific reactive hazards are known.

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

10.4 Conditions to avoid: Avoid all possible sources of ignition (spark or flame).

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

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity: Toxic if swallowed.

Irritation/Corrosion: Skin: Based on available data, the classification criteria are not met.
Eyes: Causes eye irritation.
Respiratory: Based on available data, the classification criteria are not met.

Sensitisation: Skin: May cause an allergic skin reaction.
Respiratory: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Date of issue/Date of revision: 16/07/2015.
SECTION 11: Toxicological information

Mutagenicity
Conclusion/Summary: Based on available data, the classification criteria are not met.

Carcinogenicity
Conclusion/Summary: Based on available data, the classification criteria are not met.

Reproductive toxicity
Conclusion/Summary: Based on available data, the classification criteria are not met.

Teratogenicity
Conclusion/Summary: Not available.

Specific target organ toxicity (single exposure)
Not available.

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on the likely routes of exposure
Routes of entry anticipated: Dermal, Inhalation.
Routes of entry not anticipated: Oral.

Potential acute health effects
Eye contact: Causes serious eye irritation.
Inhalation: No known significant effects or critical hazards.
Skin contact: May cause an allergic skin reaction.
Ingestion: Toxic if swallowed. Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics
Eye contact: Adverse symptoms may include the following:
pain or irritation
watering
redness
Inhalation: No specific data.
Skin contact: Adverse symptoms may include the following:
irritation
redness
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
General: Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
SECTION 11: Toxicological information

<table>
<thead>
<tr>
<th>Teratogenicity</th>
<th>No known significant effects or critical hazards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental effects</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Fertility effects</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

Other information: Not available.

Other adverse symptoms: No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity
Conclusion/Summary: Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability
Conclusion/Summary: Not available.

12.3 Bioaccumulative potential
Not available.

12.4 Mobility in soil
Soil/water partition coefficient (K_{oc}): Not available.

Mobility: Not available.

12.5 Results of PBT and vPvB assessment
PBT: No.

P: Not available. B: Not available. T: No.

vPvB: Not available.

vP: Not available. vB: Not available.

12.6 Other adverse effects: No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Return accumulated waste material to the refinery for metal recovery, or dispose of in accordance with local and national regulations.

Hazardous waste

Packaging

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions: 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 spill material and runoff and contact with soil, waterways, drains and sewers.
Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - United Kingdom (UK)
Rh-50, Acetylacetonatodicarbonyl Rhodium (I)

SECTION 14: Transport information

<table>
<thead>
<tr>
<th>14.1 UN number</th>
<th>ADR/RID</th>
<th>ADN</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN2926</td>
<td>UN2926</td>
<td>UN2926</td>
<td>UN2926</td>
<td>UN2926</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14.2 UN proper shipping name</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMMABLE SOLID, TOXIC, ORGANIC, N. O.S. (dicarbonyl (pentane-2,4-dionato-O,O')rhodium)</td>
</tr>
<tr>
<td>4.1 (6.1)</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>FLAMMABLE SOLID, TOXIC, ORGANIC, N. O.S. (dicarbonyl (pentane-2,4-dionato-O,O')rhodium)</td>
</tr>
<tr>
<td>4.1 (6.1)</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>FLAMMABLE SOLID, TOXIC, ORGANIC, N. O.S. (dicarbonyl (pentane-2,4-dionato-O,O')rhodium)</td>
</tr>
<tr>
<td>4.1 (6.1)</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>Flammable solid, toxic, organic, n.o.s. (dicarbonyl(pentane-2,4-dionato-O,O')rhodium)</td>
</tr>
<tr>
<td>4.1 (6.1)</td>
</tr>
<tr>
<td>II</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14.3 Transport hazard class(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 (6.1)</td>
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<tr>
<td>II</td>
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<td>4.1 (6.1)</td>
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<td>4.1 (6.1)</td>
</tr>
<tr>
<td>II</td>
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</tbody>
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<table>
<thead>
<tr>
<th>14.4 Packing group</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
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<tr>
<td>No.</td>
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<td>No.</td>
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<tr>
<td>No.</td>
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<table>
<thead>
<tr>
<th>14.5 Environmental hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>No.</td>
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<tr>
<td>No.</td>
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<tr>
<td>No.</td>
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<table>
<thead>
<tr>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard identification number</td>
</tr>
<tr>
<td>46</td>
</tr>
<tr>
<td>Limited quantity</td>
</tr>
<tr>
<td>1 kg</td>
</tr>
<tr>
<td>Special provisions</td>
</tr>
<tr>
<td>274</td>
</tr>
<tr>
<td>Tunnel code</td>
</tr>
<tr>
<td>(E)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14.6 Special precautions for user</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available.</td>
</tr>
</tbody>
</table>

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)
Annex XIV - List of substances subject to authorisation
Annex XIV
None of the components are listed.
Substances of very high concern

Date of issue/Date of revision: 16/07/2015.
SECTION 15: Regulatory information

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Other EU regulations

Europe inventory: This material is listed or exempted.

Seveso II Directive
This product is not controlled under the Seveso II Directive.

Danger criteria

Category

C2: Toxic
C7b: Highly flammable (R11)

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.
Japan: Not determined.
Malaysia: Not determined.
New Zealand: Not determined.
Philippines: Not determined.
Republic of Korea: Not determined.
Taiwan: This material is listed or exempted.
United States: United States inventory (TSCA 8b): Not determined.

15.2 Chemical Safety Assessment

: Not available.

Date of issue/Date of revision: 16/07/2015.
## SECTION 16: Other information

Indicates information that has changed from previously issued version.

### Abbreviations and acronyms
- ATE = Acute Toxicity Estimate
- CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
- DMEL = Derived Minimal Effect Level
- DNEL = Derived No Effect Level
- EUH statement = CLP-specific Hazard statement
- PBT = Persistent, Bioaccumulative and Toxic
- PNEC = Predicted No Effect Concentration
- RRN = REACH Registration Number
- vPvB = Very Persistent and Very Bioaccumulative

### Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flam. Sol. 2, H228</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>Acute Tox. 3, H301</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>Eye Irrit. 2, H319</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>Skin Sens. 1, H317</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>Aquatic Chronic 3, H412</td>
<td>Expert judgment</td>
</tr>
</tbody>
</table>

### Full text of abbreviated H statements
- Acute Tox. 3, H301 (oral): Toxic if swallowed.
- Eye Irrit. 2, H319: May cause an allergic skin reaction.
- Skin Sens. 1, H317: Causes serious eye irritation.
- Aquatic Chronic 3, H412: Harmful to aquatic life with long lasting effects.

### Full text of classifications [CLP/GHS]
- Acute Tox. 3, H301: ACUTE TOXICITY (oral) - Category 3
- Aquatic Chronic 3, H412: LONG-TERM AQUATIC HAZARD - Category 3
- Eye Irrit. 2, H319: SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
- Flam. Sol. 2, H228: FLAMMABLE SOLIDS - Category 2
- Skin Sens. 1, H317: SKIN SENSITIZATION - Category 1

### Full text of abbreviated R phrases
- R11- Highly flammable.
- R25- Toxic if swallowed.
- R36- Irritating to eyes.
- R43- May cause sensitisation by skin contact.
- R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### Full text of classifications [DSD/DPD]
- F - Highly flammable
- T - Toxic
- Xi - Irritant

### Notice to reader
This 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. Such information is given in good faith, being based on the latest information available to Johnson Matthey PLC and is to the best of Johnson Matthey PLC’s knowledge and belief, accurate and reliable at the time of preparation. However, no representation, warranty or guarantee is made as to the accuracy, liability or completeness and Johnson Matthey PLC assumes no responsibility therefore, and disclaims any liability for any loss, damage or injury howsoever arising (including in respect of any claim brought by any third party) incurred using this information. The product is supplied on the condition that the user accepts responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. Freedom from patent or any other proprietary rights of any third party must not be assumed.

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