Palladium(II) chloride

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product Description: Palladium(II) chloride
Cat No.: 43085
Synonyms: Palladium chloride; Palladium dichloride; Palladous chloride
CAS No: 7647-10-1
Molecular Formula: Cl₂ Pd
Supplier: Alfa Aesar
Avocado Research Chemicals, Ltd.
Shore Road
Port of Heysham Industrial Park
Heysham, Lancashire LA3 2XY
United Kingdom
Office Tel: +44 (0) 1524 850506
Office Fax: +44 (0) 1524 850608

Emergency Telephone Number: Call Carechem 24 at
+44 (0) 1865 407333 (English only);
+44 (0) 1235 239670 (Multi-language)

E-mail address: uktech@alfa.com
www.alfa.com
Product Safety Department

Recommended Use: Laboratory chemicals.
Uses advised against: No Information available

SECTION 2. HAZARD IDENTIFICATION

Physical State: Powder Solid
Appearance: Red brown
Odor: Odorless

Emergency Overview:
May be corrosive to metals. Harmful if swallowed. May cause an allergic skin reaction. Causes serious eye damage. Very toxic to aquatic life with long lasting effects.

Classification of the substance or mixture

| Substances/mixtures corrosive to metal | Category 1 |
| Acute Oral Toxicity | Category 4 |
| Serious Eye Damage/Eye Irritation | Category 1 |
| Skin Sensitization | Category 1 |
| Acute aquatic toxicity | Category 1 |
| Chronic aquatic toxicity | Category 1 |

Label Elements
Signal Word Danger

Hazard Statements
H290 - May be corrosive to metals
H302 - Harmful if swallowed
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H410 - Very toxic to aquatic life with long lasting effects

Precautionary Statements
Prevention
P234 - Keep only in original container
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves/protective clothing/eye protection/face protection
Response
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P330 - Rinse mouth
P363 - Wash contaminated clothing before reuse
P390 - Absorb spillage to prevent material damage

Storage
P406 - Store in corrosion resistant polypropylene container with a resistant inliner
Disposal
P501 - Dispose of contents/container to an approved waste disposal plant

Physical and Chemical Hazards
May be corrosive to metals.

Health Hazards
Harmful if swallowed. May cause an allergic skin reaction.

Environmental hazards
Very toxic to aquatic life with long lasting effects. Will likely be mobile in the environment due to its water solubility. The product is water soluble, and may spread in water systems.

Other Hazards

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight %</th>
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</thead>
<tbody>
<tr>
<td>Palladium(II) chloride</td>
<td>7647-10-1</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

General Advice
If symptoms persist, call a physician.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

**Skin Contact**  
Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

**Inhalation**  
Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

**Ingestion**  
Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

**Most important symptoms and effects**  
Causes severe eye damage. May cause allergic skin reaction. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing.

**Self-Protection of the First Aider**  
Use personal protective equipment as required.

**Notes to Physician**  
Treat symptomatically.

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**SECTION 5. FIRE-FIGHTING MEASURES**

**Suitable Extinguishing Media**  
Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.

**Extinguishing media which must not be used for safety reasons**  
No information available.

**Specific Hazards Arising from the Chemical**  
Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition. Do not allow run-off from fire-fighting to enter drains or water courses.

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

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**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Personal Precautions**  
Use personal protective equipment as required. Ensure adequate ventilation. Avoid dust formation.

**Environmental Precautions**  
Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

**Methods for Containment and Clean Up**  
Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed containers for disposal.

Refer to protective measures listed in Sections 8 and 13.

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**SECTION 7. HANDLING AND STORAGE**

**Handling**  
Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid dust formation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation.
Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

Specific Use(s)
Use in laboratories

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS14/3 General methods for sampling and gravimetric analysis of respirable and inhalable dust

Exposure Controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. 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 Polyvinyl alcohol or nitrile- butyl-rubber gloves

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Breakthrough time</th>
<th>Glove thickness</th>
<th>EU standard</th>
<th>Glove comments</th>
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<tbody>
<tr>
<td>Natural rubber</td>
<td>See manufacturers recommendations</td>
<td>-</td>
<td>EN 374</td>
<td>(minimum requirement)</td>
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<tr>
<td>Nitrile rubber</td>
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<tr>
<td>Neoprene</td>
<td></td>
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<td></td>
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<tr>
<td>PVC</td>
<td></td>
<td></td>
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</tbody>
</table>

Inspect gloves before use.

Hand Protection

Skin and body protection
Long sleeved clothing

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

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.
Environmental exposure controls  Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Appearance</td>
<td>Red brown</td>
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<tr>
<td>Physical State</td>
<td>Powder Solid</td>
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<td>Melting Point/Range</td>
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<td>Evaporation Rate</td>
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<td>Flammability (solid,gas)</td>
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<td>Explosion Limits</td>
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<td>Vapor Pressure</td>
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<td>Partition Coefficient (n-octanol/water)</td>
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<tr>
<td>Autoignition Temperature</td>
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<td>Decomposition Temperature</td>
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<td>Viscosity</td>
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<td>Explosive Properties</td>
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<td>Oxidizing Properties</td>
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</table>

Molecular Formula: Cl2 Pd
Molecular Weight: 177.31

SECTION 10. STABILITY AND REACTIVITY

Stability  Stable under normal conditions.
Hazardous Reactions None under normal processing.
Hazardous Polymerization  Hazardous polymerization does not occur.
Conditions to Avoid  Avoid dust formation. Incompatible products. Excess heat.


SECTION 11. TOXICOLOGICAL INFORMATION

(a) acute toxicity:

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
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<tbody>
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<td>Palladium(II) chloride</td>
<td>LD50 = 2704 mg/kg (Rat)</td>
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</tbody>
</table>
(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;
   Respiratory No data available
   Skin Category 1
      May cause sensitization by skin contact

(e) germ cell mutagenicity; No data available
      Not mutagenic in AMES Test

(f) carcinogenicity; No data available
      Possible cancer hazard. May cause cancer based on animal data

(g) reproductive toxicity; No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; No data available
   Target Organs None known.

(j) aspiration hazard; Solid
      Not applicable

Symptoms / effects, both acute and delayed
Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Persistence and Degradability

Persistence Soluble in water.

Degradability Not relevant for inorganic substances.

Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

Bioaccumulative Potential May have some potential to bioaccumulate

Mobility in soil The product is water soluble, and may spread in water systems. Will likely be mobile in the environment due to its water solubility. Highly mobile in soils
Endocrine Disruptor Information
This product does not contain any known or suspected endocrine disruptors

Persistent Organic Pollutant
This product does not contain any known or suspected substance

Ozone Depletion Potential
This product does not contain any known or suspected substance

### SECTION 13. DISPOSAL CONSIDERATIONS

Waste from Residues/Unused Products
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. Should not be released into the environment.

Contaminated Packaging
Dispose of this container to hazardous or special waste collection point.

Other Information
Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Do not let this chemical enter the environment.

### SECTION 14. TRANSPORT INFORMATION

#### Road and Rail Transport

<table>
<thead>
<tr>
<th>UN-No</th>
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<tr>
<td>Proper Shipping Name</td>
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<tr>
<td>Technical Shipping Name</td>
<td>Palladium chloride</td>
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<td>Hazard Class</td>
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<tr>
<td>Packing Group</td>
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#### IMDG/IMO

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<tr>
<td>Hazard Class</td>
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#### IATA

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<td>Corrosive solid, acidic, inorganic, n.o.s.</td>
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<tr>
<td>Technical Shipping Name</td>
<td>Palladium chloride</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>8</td>
</tr>
<tr>
<td>Packing Group</td>
<td>III</td>
</tr>
</tbody>
</table>

Special Precautions for User
No special precautions required

### SECTION 15. REGULATORY INFORMATION

**International Inventories**
China, X = listed, Australia, U.S.A. (TSCA), Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Australia (AICS), Korea (KECL), China (IECSC), Japan (ENCS), Philippines (PICCS).

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<tr>
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<td>-</td>
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<td>X</td>
<td>231-596-2</td>
<td>X</td>
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</table>
SECTION 16. OTHER INFORMATION

Prepared By: Health, Safety and Environmental Department
Creation Date: 15-Nov-2010
Revision Date: 29-Jan-2021
Revision Summary: Not applicable.

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

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
- 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
- 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
- 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
- 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
- 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)

Key literature references and sources for data
- https://echa.europa.eu/information-on-chemicals
- Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

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