# Safety Data Sheet

# Tetraammine Palladium（II）Chloride Solution

1st Version : Jun. 27. 2012
Revised : Mar. 31. 2025

## 1. Product and company information

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|---|---|
| Product Name : | Tetraammine Palladium（II）Chloride Solution |
| Company Name : | Toyo Chemical Industrial Co., Ltd. |
| Address : | 2-26-13, Naka-Izumi, Komae-City, Tokyo |
| Tel : | +81-3-3489-5152 |
| Fax : | +81-3-3489-5152 |
| Emergency Contact : | As above |
| Recommended use of the product and restrictions on use : | Palladium plating |

## 2. Hazard identification

GHS classification of the substance: All items are "Outside scope of classification" or "Cannot classify".

GHS Label elements

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| Pictograms : | None |
| Signal word : | None |
| Hazard statements : | None |

Precautionary statement

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| Safety measures : | Do not breathe gas/mist/vapors.<br>Wash thoroughly after handling.<br>Do not eat, drink or smoke when using this product.<br>Wear protective gloves/protective clothing/eye protection/face protection.<br>Avoid release to the environment. |
| Emergency measures : | If swallowed : Call a doctor. If you feel unwell.<br>If swallowed : Rinse mouth. Do not induce vomiting.<br>If on skin : Wash with plenty of water/soap<br>If inhaled: Remove person to fresh air and keep comfortable for breathing.<br>If in eyes: Rinse cautiously with water for several minutes.<br>Remove contact lenses if present and easy to do. Continue rinsing.<br>If eye irritation persists: Get medical advice/attention. |
| Storage: | Store locked up. |
| Disposal: | Dispose of contents/container entrust to a specialized waste disposal company. |
| Other hazards : | No information |

## 3. Composition/information on ingredients

Substance or Mixture : Mixture

| Chemical name | Molecular formula (molecular weight) | CAS No. | Reference numbers in gazetted list in Japan (CSCL) | Reference numbers in gazetted list in Japan (ISHL) | Concentration or concentration range |
|---|---|---|---|---|---|
| Tetraammine Palladium（II）Chloride | $[Pd(NH_3)_4]Cl_2$ (245.45) | 13815-17-3 | 1-1122 | — | 20.5 % |
| Ammonia | $NH_3$ (17.03) | 7664-41-7 | 1-391 | 1-391 | 0.5 % |
| Water | $H_2O$ (18.02) | 7732-18-5 | — | — | 79.0 % |

## 4. First-aid measures

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| Inhalation : | Remove person to fresh air and keep comfortable for breathing.<br>Get medical advice/attention if you feel unwell. |
| Skin contact : | Wash with plenty of water.<br>If skin irritation or rash occurs: Get medical advice/attention. |
| Eye contact : | Rinse cautiously with water for several minutes.<br>Remove contact lenses if present and easy to do.<br>Continue rinsing.<br>If eye irritation persists: Get medical advice/attention. |
| Ingestion : | Rinse mouth.<br>Call a doctor. If you feel unwell. |
| Protection of people implementing emergency measures : | Rescuers should wear suitable protective equipment according to the circumstances.<br>(See section 8. Exposure controls / personal protection) |

## 5. Fire-fighting measures

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| Suitable extinguishing media : | Powder, Carbon dioxide gas, Water spray, Copious amounts of water |
| Do not use extinguishing media : | No information |
| Specific hazards : | This substance is nonflammable and does not burn itself, but can decompose when heated to outbreak harmful gas, so wear protective equipment when firefighting. |
| Characteristic extinguishing methods: | In case of fire in the surroundings, immediately move the container to a safe place.<br>If it cannot be moved, cool it by sprinkling water around the container and its surroundings.<br>In case of ignition, extinguish with plenty of water. |
| Protection of firefighters: | Wear appropriate air-breathing apparatus and chemical protective clothing when extinguishing fires.<br>(See section 8. Exposure controls / personal protection) |

## 6. Accidental release measures

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| Personal precautions, protective equipment and emergency procedures : | Workers must wear appropriate protective equipment (see section 8. Exposure controls / personal protection) and avoid contact with eyes and skin and inhalation.<br>During work, wear protective equipment to prevent inhalation of dust, dust and gas, and work from the windward side.<br>Prohibit the entrance except the person concerned. |
| Environmental precautions : | Avoid discharging into the environment. |
| Methods and materials for containment and cleaning up : | No information |
| Preventing secondary accidents : | Prevent inflow to drainage ditches, sewers, cellars, or sealed locations. |

## 7. Handling and storage

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| Handling | |
| Technical measures : | Take the equipment measures described in "8. Exposure controls/personal protection" and wear protective equipment.<br>Described in "8. Exposure controls/personal protection" perform local exhaust and general ventilation. |
| Precautions for safe handling : | Obtain instructions befor use.<br>Do not handle until all safety precautions have been read and understood.<br>Do not eat, drink or smoke when using this product.<br>Wash hands thoroughly after handling.<br>Do not contact, inhale or swallow.<br>Do not put it in eyes.<br>Avoid discharging into the environment. |
| Contact evasion : | See “10. Stability and reactivity” section. |
| Storage | |
| Safe storage conditions : | Store locked up.<br>Store in a closed container, dry and dark place. |
| Container and packing materials : | Airtight containers (Polypropylene, polyethylene, etc.) |

## 8. Exposure controls/personal protection

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|---|---|
| Control concentration : | No information |
| Tolerable concentration : | No information |
| Equipment measures : | Workplaces storing or handling this material should be equipped with an eyewash facilities and safety shower.<br>Enclose the equipment or install a local exhaust ventilation to prevent exposure. |
| Protective Equipment | |
| Respiratory protection : | Wear suitable respiratory protection (gas mask (in case of fire: air respirator), dust mask).<br>(Refer to JIS T8151 Particulate respirators, JIS T8152 Gas respirators,<br>JIS T8155 Compressed air open-circuit self-contained breathing apparatus) |
| Hand protection : | Wear suitable protective gloves. (rubber gloves, etc.)<br>(Refer to JIS T8116 Chemical protective gloves) |
| Eye protection : | Wear suitable eye protection (regular glasses, plain glasses with side plates, goggles).<br>(Refer to JIS T8147 Protective Glasses) |
| Skin and body protection : | Wear suitable protective clothing, and protective boots, etc.<br>(Refer to JIS T8115 Chemical Protective Clothing, JIS T8117 Chemical Protective Boots) |

## 9. Physical and chemical properties

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| Physical state : | Liquid |
| Color : | Light yellow |
| Odor : | Weak ammonia odor |
| Melting point/freezing point : | No information |
| Boiling point, initial boiling point, | No information |
| and boiling range : | No information |
| Dlammability : | |
| Lower and upper explosion limit / | No information |
| flammability limit : | No information |
| Flash point : | No information |
| Aut-ignition temperature : | No information |
| Decomposition temperature : | |
| pH : | 10 ~ 11 |
| Kinematic viscosity : | No information |
| Solubility : | Mix arbitrarily in water |
| Partition coefficient: n-octanol / water | No information |
| (log value) : | |
| Vapor pressure : | No information |
| Density and/or relative density | About 1.12 |
| Relative vapour density : | No information |
| Particle characteristics : | No information |

## 10. Stability and reactivity

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|---|---|
| Reactivity : | No information |
| Chemical stability : | Stable substance under normal conditions. |
| Possibility of hazardous reactions : | Reduced to metallic palladium by a strong reducing agent.<br>Harmful gases is released by contact with strong acids and exposure to high temperatures.<br>Contact or mixture with flammable substances may cause heating and ignition due to<br>the catalytic reaction of palladium. |
| Conditions to avoided : | Heat |
| Incompatible materisls : | Reducing agents, metals, strong acid, and organic substances |
| Hazardous decomposition products : | Nitrogen oxide |

## 11. Toxicological information

Acute toxicity

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|---|---|
| Oral : | Classification is not possible due to lack of data. |
| Dermal : | It has been reported that subcutaneous injection of a water-soluble Pd salt into rats causes necrosis at the administration site when the amount is large, but classification is not possible due to lack of data. |
| Inhalation : Gases | Classification is not possible due to lack of data. |
| Inhalation : Vapours | Classification is not possible due to lack of data. |
| Inhalation : Dusts and mists | Classification is not possible due to lack of data. |
| Skin corrosios/irritation : | Classification is not possible due to lack of data. |
| Serious eye damage/irritation : | Classification is not possible due to lack of data. |
| Respiratory sensitization : | Classification is not possible due to lack of data. |
| Skin sensitization : | May cause skin allergy, but classification is not possible due to lack of data. |
| Germ-cell mutagenicity : | Classification is not possible due to lack of data. |
| Carcinogenicity : | Classification is not possible due to lack of data. |
| Reproductive toxicity : | Classification is not possible due to lack of data. |
| Specific target organ toxicity (single exposure) : | Classification is not possible due to lack of data. |
| Specific target organ toxicity (repeated exposure ) : | Classification is not possible due to lack of data. |
| Aspiration hazard : | Classification is not possible due to lack of data. |

## 12. Ecological information

Toxicity

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|---|---|
| Hazardous to the aquatic environment (acute) : | Classification is not possible due to lack of data. |
| Hazardous to the aquatic environment (chronic) : | Classification is not possible due to lack of data. |
| Persistence and degradability : | No information |
| Bioaccumulative potential : | No information |
| Mobility in soil : | No information |
| Hazard to the ozone layer : | The materials concerned are not listed by an affiliated book of Montreal Protocol. |

## 13. Disposal Precautions:

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| Residual waste : | Recover palladium using reduction roasting or oxidative precipitation.<br>Do not incinerate in an incinerator or the like without a cleaning device because a gas containing harmful components is generated during incineration (It is desirable to outsource to a specialized company).<br>Outsource to an industrial waste disposal contractor licensed by the prefectural governor, or if a local public entity does the disposal, outsource it there.<br>If outsourcing waste disposal, thoroughly notify the disposal companies of the dangers and harmfulness before outsourcing.<br>Avoid discharging wastewater and washing wastewater containing this substance of directly into rivers, or landfill, or dumping. |
| Dirty containers and packaging : | Containers should be disposed properly according to relevant laws and local government standards.<br>When disposing of empty containers, completely remove the contents. |

## 14. Transport information

International regulations

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| UN No. : | No information |
| Proper shipping name : | No information |
| Class : | No information |
| Sub risk : | No information |

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| Packing group : | No information |
| Marine pollutant (sea) : | Not applicable |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code : | Not applicable |

Japanese regulations

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|---|---|
| Land regulations information : | Not applicable |
| Maritime regulations information : | Not applicable |
| Aviation regulations information : | Not applicable |
| Special safety measures : | When transporting, avoid direct sunlight, load containers without damage, corrosion, or leakage, and securely prevent collapse of cargo. |

## 15. Regulatory information (Japanese law)

Ammonia is designated under Article 57 (labelling),
Article 57-2 (SDS), and Article 57-3 (risk assessment) of the Industrial Safety and Health Act.

＊Laws and regulations are examples and do not cover domestic laws and regulations.

## 16. Other information

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| References, etc. : | GHS classification results database: NITE website<br>GHS model SDS information: JISHA website<br>Ministry of health, labor and welfare website<br>JIS Z7252：2019<br>JIS Z7253：2019<br>Selection Manual for Protective Equipment for Prevention of Skin Damage, etc. (Ministry of Health, Labour and Welfare Feb.2024 ) |

*Caution:

Althoug hazard and harmfulness evaluations are based on the data and information available at the current time, they may not be sufficient.
Please handle with care.
Furthermore, the data and evaluations described herein are not in any way guaranteed. The descriptions refer to normal handling.
Regarding special handling, please handle based on the safty measures which are suitable for the intended applications and methods of use.
This SDS is an English translation of a document prepared in Japanese in accordance with JIS Z7253:2019.