

Safety Data Sheet

Palladium Sulfate Solution

Created: July, 29, 2010
Revised: Nove. 01, 2016

1. Chemical Articles and Company Information

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| Name of Chemical Article: | Palladium Sulfate (II) Solution |
| Company Name: | Toyo Chemical Industrial Co., Ltd. |
| Address: | 2-26-13 Naka-Izumi, Komae-City, Tokyo |
| Tel.: | +81-3-3489-5152 |
| Fax: | +81-3-3488-1706 |
| Emergency Contact: | As above |
| Recommended Applications and Use Restrictions: | Palladium plating and catalysts |

2. Summary of Hazards

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| GHS Classification | | |
| Damage to health | Acute (oral) toxicity | Class 5 |
| | Acute (inhaled: dust and mist) toxicity | Class 2 |
| | Skin corrosiveness and irritation | Class 1A |
| | Critical injury to eyes and eye irritant | Class 1 |
| | Specific marker organ and systemic toxicity (single exposure) | Class 1 (respiratory system) |
| | Specific marker organ and systemic toxicity (repeated exposure) | Class 1 (respiratory system) |
| | Damage to the environment | Acute aquatic environmental harm |

GHS Label Elements

Picture descriptions:



Cautionary terms:

Hazard information:

Danger

Harmful if ingested (orally)

Dangerous to life if inhaled (mist)

Critical chemical burns to skin and injury to eyes

Risk of malign influence on reproductive functions or fetus

Risk of organ (haemal system) damage and respiratory organ irritation

Risk of organ (dental and respiratory system) damage due to long-term or repeated exposure

Risk of toxicity to aquatic life

Risk of toxicity to aquatic life forms due to long-term effects

Cautions

Safety Measures:

Do not handle until all safety precautions and readings are understood.

When using the product, do not eat, drink, or smoke.

Store away from reducing agents.

Avoid heat.

Wear protective gloves, goggles, and face mask.

Prevent contact with eyes, skin, and clothing.

Do not inhale the dust.

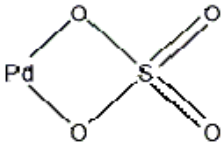
Wash hands thoroughly after handling.

Avoid discharging into the environment.

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| Emergency Measures: | <p>If the substance contacts the eye, irrigate with water thoroughly for several minutes. If contact lenses can be removed easily, remove and wash them.</p> <p>If eye irritation persists, consult a physician and receive treatment.</p> <p>If clothing is spattered, promptly remove and isolate all soiled clothing.</p> <p>If the substance adheres to the skin, wash using copious amounts of soap and water.</p> <p>If skin irritation occurs, consult a physician to receive diagnosis and treatment.</p> <p>If exposed or fear exposure, consult a physician to receive diagnosis and treatment.</p> <p>If ingested, rinse out the mouth, and immediately consult a physician to receive diagnosis and treatment.</p> <p>If you feel unwell, consult a physician to receive diagnosis and treatment.</p> <p>Gather any leaks.</p> |
| Storage: | <p>Lock the storage location.</p> <p>Store away from reducing agents.</p> |
| Disposal: | <p>If discarding contents or containers, entrust to a specialized waste disposal company.</p> |
| Other hazards: | <p>Not available</p> |

3. Composition and Component Information

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| Single Substance or Mixture: | Single Substance |
| Chemical name or general name: | Palladium Sulfate (II) |
| Another name: | - |
| Concentration or concentration range: | PdSO ₄ : 7.6% (Pd 4.0%) |
| Molecular formula (molecular weight): | PdSO ₄ (202.48) |
| Chemical characteristics (rational or structural formula): |  |
| CAS No.: | 13566-03-5 |
| Reference numbers in gazetted list in japan(CSCL and ISHL): | 1-(3)-375 |
| Impurities and stabilization additives that contribute to the classification: | Sulfuric acid |

4. Emergency Measures

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| If inhaled: | <p>Move to a location with fresh air.</p> <p>If you feel unwell, consult a physician to receive diagnosis and treatment.</p> |
| Adhesion to skin: | <p>Remove soiled clothing and shoes, and thoroughly wash any adhesions or contact parts with cold or lukewarm water.</p> <p>If changes in appearance manifest, or pain continues, consult a physician.</p> |
| Contact with eyes: | <p>If the substance contacts the eye, irrigate with water thoroughly for several minutes.</p> <p>If eye irritation persists, consult a physician and receive treatment.</p> |
| If ingested: | <p>Rinse mouth.</p> <p>If you feel unwell, consult a physician to receive diagnosis and treatment.</p> |
| The most important sign of an acute symptom and the tardive symptom and symptom: | <p>Corrosiveness, burning sensation, pharyngeal pain, cough, feeling of dyspnea, shortness of breath, rubefaction, pain, blisters, severe skin burns, stomach pains, shock, or lethargy.</p> |
| Protection of people implementing emergency measures: | <p>Rescuers should wear suitable protective equipment according to the circumstances.</p> |
| Special precautions for physicians: | <p>In many cases, pulmonary edema symptoms are not identified until 2 to 3 hours have elapsed, so rest and continual observation are necessary.</p> |

5. Measures during Fires

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| Extinguishing agents: | This product in itself does not burn. Use the appropriate extinguishant depending on neighboring fires. |
| Extinguishing that must not be used: | No information |
| Characteristic dangers: | Non-flammable, so itself is not burned, but strong heat causes harmful gas (SOX) to be emitted, so wear protective equipment when firefighting. |
| Characteristic extinguishing methods: | Promptly move containers in the vicinity of the fire to a safe location. If moving is not possible, scatter water on the containers and their surroundings to cool. If ignition occurs, douse the fire using copious amounts of water. At this time, make sure there is no discharge of concentrated effluent into rivers, etc. |
| Protection of firefighters: | Fight fire from upwind, and avoid inhaling poisonous gasses, etc. Wear respiratory protectors depending on the circumstances. Keep upwind all personnel unnecessary to disaster prevention activities. |

6. Measures during Leaks

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| Physical precautions, protective equipment, and measures during emergencies: | The worker wears a tool for appropriate protection (in item of "8. Exposure Avoidance and Protection Measures" reference) and avoids clothes, contact and inhalation to skin. Cordon off the periphery of the dispersal area to prohibit the entrance of personnel. |
| Environmental precautions: | Avoid discharging into the environment. |
| Methods and materials for contamination and methods and materials for cleaning up: | No information |
| Collection and neutralization: | Collect spatter in a container, and neutralize using soda ash, and then wash away using copious amounts of water. |
| Preventing secondary accidents: | Prevent inflow to drainage ditches, sewers, cellars, or sealed locations. |

7. Handling and Storage Precautions

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| Handling | |
| Technical measures: | Install local exhausters, and eye and hand washing facilities, in the handling locations. Ideally, handle in locations with local exhausters and overall ventilators. Wear protective gloves, goggles, and face mask. |
| Precautions for safe handling: | Do not handle until all safety precautions and readings are understood. When using the product, do not eat, drink, or smoke. Do not touch, inhale, or drink. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling. If not using deliberately, avoid discharging into the environment. |
| Contact evasion: | In item of "10. Stability and Reactivity" reference. |
| Storage | |
| Safe storage conditions: | Avoid contact with heat, strong alkalis, and reducing agents. Lock the storage location. Securely seal the containers, and store in a well-ventilated. Technical measures: No information |
| Container and packing materials: | Use containers regulated by UN transportation laws. |

8. Exposure Avoidance and Protection Measures

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| Control concentration: | No information |
| Tolerable concentration: | |
| Japan Society for Occupational Health (2015) | 1 mg/m ³ (As the sulfuric acid) |
| ACGIH (2013) | 0.2 mg/m ³ (TLV-TWA) (As the sulfuric acid) |
| Equipment Measures: | Install local exhausters, and eye and hand washing facilities, in the handling locations. |

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Protective Equipment

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| Respirator: | Wear suitable respirator. (Breathing apparatuses, etc) |
| Hand protective equipment: | Wear suitable protective gloves. (Neoprene gloves, etc.) |
| Eye protective equipment: | Wear suitable eye protective equipment. (Goggles, etc.) |
| Skin and body protective equipment: | Wear suitable protective face equipment, clothing, and protective shoes, etc. (Impermeable protective clothing, protective boots, etc.) |

9. Physical and Chemical Properties

Physical properties

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| Shape: | Liquid |
| Color: | Reddish-brown |
| Odor: | Odorless |
| Odor threshold value: | No information |
| pH: | 1 max. |
| Melting point and coagulation point: | No information |
| Boiling point, initial boiling point, and boiling range: | No information |
| Ignition Point: | No information |
| Vaporization speed (butyl chloride=1): | No information |
| Burnability (solids and gas): | No information |
| Explosion range: | No information |
| Vapor pressure: | No information |
| Vapor density (vapor=1): | No information |
| Specific gravity (density): | 1.2~1.3 |
| Solubility: | No information |
| n-Octanol/water partition coefficient: | No information |
| Spontaneous ignition temperature: | No information |
| Dissolution temperature: | No information |
| Viscosity: | No information |

10. Stability and Reactivity

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| Reactivity: | No information |
| Stability: | When water is enough, it is disintegrated, and palladium(II)Oxide occurs. |
| Possibility of harmful reactions: | Reduced to metal palladium by a strongly reducing agent. Contact with metals and exposure to high temperatures causes a harmful gas (SOx) to be emitted. Contact or mixture with flammable substances may cause heating and ignition due to the catalytic reaction of palladium. |
| Conditions to be avoided: | Heat and Humidity |
| Incompatible substances: | Reducing agents, metals, strong alkalis, and organic substances |
| Hazardous degradable organisms: | Sulfur oxides |

11. Harmfulness Information

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| Acute toxicity | |
| Oral: | Rat oral: LD50; 1,420mg/kg. (As the sulfuric acid) |
| Pass; skin: | No data available |
| Inhalation:Gas | The definition of GHS is a liquid. |
| Inhalation:Steam | The definition of GHS is a liquid. |
| Inhalation:Dust,Mist | Inhalation (mist): Rat LC50; 0.375mg/L. (As the sulfuric acid) |
| Skin corrosiveness and irritation: | As the pH is 1 max., the substance is judged to be corrosive. |
| Critical injury to eyes and eye irritant: | The serious damage of eyes with the dissolution of the anterior chamber of eye was accepted in the accident example in the Homo sapiens. (As the sulfuric acid) Acridity was recognized for the eyes of the rabbit. (As the sulfuric acid) |
| Respiratory organ sensitivity: | No data available |
| Skin sensitivity: | No data available |

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| Germ-cell mutagenicity: | No data available |
| Carcinogenicity: | No data available |
| Reproductive toxicity: | No data available |
| Specific marker organs and systemic toxicity (single exposure): | Respiratory tract stimulation symptoms such as a cough, the shortness of breath are recognized in the inhalational revelation with the low concentration in the Homo sapiens. (As the sulfuric acid) The permanent influence such as the functional decline of the lungs and fiberization, the emphysema was recognized other than acute influence such as a cough, shortness of breath, the bloody phlegm discharge in the highly-concentrated revelation. (As the sulfuric acid) The bleeding of the lungs in the inhalational revelation and functional disorder were accepted in a marmot. (As the sulfuric acid) |
| Specific marker organs and systemic toxicity (repeated exposures): | Cell proliferation was accepted in the inhalational revelation examination for 28 days in rats by a larynx mucous membrane. (As the sulfuric acid) The nasal septum edema, pulmonary emphysema, atelectasis, bronchiolar hyperemia, edema, bleeding, respiratory tracts such as clots and lungs disorder was accepted in the repetition inhalational revelation examination for 14-139 days in the marmot. (As the sulfuric acid) The histologic changes such as the hyperplasia of the cell, the thickening of the wall were accepted in the inhalational revelation examination for 78 weeks in the Macaca fascicularis by the bronchiole of the lungs. (As the sulfuric acid) |
| Inhalable respiratory organ harmfulness: | No data available |

12. Environmental Impact Information

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| Ecotoxicity | |
| Aquatic environmental harm (acute hazard): | Bluegills: LC50; 16 - 28 mg/L 96h (As the sulfuric acid) |
| Aquatic environmental harm (long-term hazard): | No data available |
| 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: | Collect the palladium using a roasting and reduction process, or an oxide precipitation process. During roasting, gasses containing harmful substances are emitted, so do not roast using an incinerator without cleaning equipment. (Ideally, entrust to a specialized company.) |
| Dirty containers and packaging: | Suitably process containers according to the relevant regulations and local government standards. When disposing of empty containers, make sure to discard the contents completely. |

14. Shipping Precautions

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| International Regulations | |
| UN No.: | 2796 |
| Proper Shipping Name: | Sulphuric acid with 51% or less acid |
| Class: | Class 8: Corrosive |
| Sub Risk: | - |
| Packing Group: | II |
| Marine Pollutant: | - |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: | No |
| Japanese Regulations | |
| Land Regulation Information: | Obey Poisonous and Deleterious Substances Control Law and Fire Services Act regulations. |
| Maritime Regulation Information: | Obey Ship Safety Law regulations. |
| Aviation Regulation Information: | Obey the Civil Aeronautics Act. |

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Special safety measures: During transport, avoid direct sunlight, and load so that the containers are not damaged, corroded, or leaking, and secure the load to prevent toppling.
Do not transport together with food or livestock feed.
Yellow card display is required during transport.

15. Applicable Laws

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| Fire Service Act: | Substances requiring notification of storage (As the sulfuric acid) (200kg) |
| Poisonous and Deleterious Substances Control Law: | Non-medical deleterious substances |
| Industrial Safety and Health Law: | Notifiable substance (Article 57-2, government ordinance Article 18-2 attached table No. 9-613) (As the sulfuric acid) |
| Ordinance on Prevention of Hazards due to Specified Chemical Substances: | Specified Chemical Substance (Group 3) (As the sulfuric acid) |
| Regulations for the carriage and storage of dangerous goods in ship: | Corrosive Substances |
| Civil Aeronautics Act: | Corrosive Substances |

16. Other Information

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| Bibliography: | GHS classification results database: NITE website GHS model SDS information: JISHA website Reagent guidebook (Revised 2003) Collection of Poisonous Materials Standard Notifications Dictionary of Chemistry (1987 30th printing: Kyoritsu Shuppan) 16112 Chemical Products (2012 The Chemical Daily) |
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***Caution:**

Hazard and harmfulness evaluations were created using the data and information available at the current time, but is not necessarily thorough, so handle with care.

Further, the data and evaluations described herein are not in any way guaranteed. The descriptions refer to normal handling, so for special handling, first implement safety measures conforming to the new application and methods of use.

This SDS is translated into English.(Original version is Japanese)