

## Safety Data Sheet

## Palladium Nitrate Solution

Created: Feb. 01, 2011

Revised: Nov. 01, 2016

## 1. Chemical Articles and Company Information

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

## 2. Summary of Hazards

GHS Classification

Physicochemical hazards	Oxidizing liquids	Class 3
Damage to health	Acute toxicity (inhaled: mist)	Class 1
	Skin corrosiveness and irritation	Class 1
	Critical injury to eyes and eye irritant	Class 1
	Specific target organ and systemic toxicity (single exposure)	Class 1 (respiratory system)
	Specific target organ and systemic toxicity (repeated exposure)	Class 1 (respiratory system, teeth)

## GHS Label Elements

Picture descriptions:



Cautionary terms:

Danger

Hazard information:

Risk of fire accelerant: Oxidation substance  
 Danger to life if inhaled  
 Damage of critical chemical burns to skin and injury to eyes  
 Critical eye injury  
 Respiratory system obstacle  
 Respiratory system and tooth disorder by for the long term or repeated exposure

Cautions

Safety Measures:

Keep away from ignition sources such as heat, fireworks, naked flames, and high temperatures.  
 Take preventive measures to avoid mixing with flammable.  
 Do not breathe dust/fume/gas/mist/vapors/spray  
 Wash hands thoroughly after handling.  
 When using the product, do not eat, drink, or smoke.  
 Use only outdoors or in a well-ventilated area.  
 Wear protective gloves, goggles, and face mask.

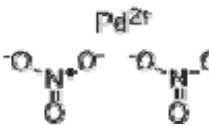
Emergency Measures:

If ingested, rinse out the mouth, and immediately consult a physician for treatment.  
 If clothing is spattered, promptly remove and isolate all soiled clothing.  
 If the substance adheres to the skin, wash using copious amounts of water.  
 If inhaled, move to a location with fresh air, and rest in a posture that facilitates breathing.  
 If the substance contacts the eye, irrigate with water thoroughly for several minutes. If contact lenses can be removed easily, remove and wash them.

## MSDS-26 Palladium Nitrate Solution (2/6)

Storage:	If exposed or fear exposure, consult a physician to receive diagnosis and treatment. If you feel unwell, consult a physician to receive diagnosis and treatment. Store in a well-ventilated place. Keep container tightly closed Lock the storage location. Keep container with the noncorrosive.
Disposal:	If discarding contents or containers, entrust to a specialized waste disposal company.
Other hazards:	Not available

### 3. Composition and Component Information

Single Substance or Mixture:	Single Substance
Chemical name or general name:	Palladium (II) Nitrate
Another name:	-
Concentration or concentration range:	32.0% (15% as Pd)
Molecular formula (molecular weight):	$\text{Pd}(\text{NO}_3)_2$ (230.43)
Chemical characteristics (rational or structural formula):	
CAS No.:	10102-05-3
Reference numbers in gazetted list in japan (CSCL and ISHL):	1-489
Impurities and stabilization additives that contribute to the classification:	No information

### 4. Emergency Measures

If inhaled:	If inhaled, move to a location with fresh air, and rest in a posture that facilitates breathing. If you feel unwell, consult a physician to receive diagnosis and treatment.
Adhesion to skin:	Remove soiled clothing and shoes, and thoroughly wash any adhesions or contact parts with cold or lukewarm water. If changes in appearance manifest, or pain continues, consult a physician.
Contact with eyes:	If the substance contacts the eye, irrigate with water thoroughly for several minutes. If eye irritation persists, consult a physician and receive treatment.
If ingested:	Rinse mouth. If you feel unwell, consult a physician to receive diagnosis and treatment.
The most important sign of an acute symptom and the tardive symptom and symptom:	If inhaled: Burning sensation, a cough, suffocation, loss of consciousness. The symptom is late and may appear.
Protection of people implementing emergency measures:	No information
Special precautions for physicians:	No information

### 5. Measures during Fires

Extinguishing agents:	Copious amounts of water
Extinguishing agents that must not be used:	No information
Characteristic dangers:	Thermal decomposition can lead to release of irritating and toxic gases and vapors.
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:	When firefighting, wear full (heat resistant) protective clothing including suitable breathing equipment.

### 6. Measures during Leaks

## MSDS-26 Palladium Nitrate Solution (3/6)

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. Touch the leak thing and do not walk the inside. Cordon off the periphery of the dispersal area to prohibit the entrance of personnel. Prohibit the entrance except the person concerned.
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 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

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.
Precautions for safe handling:	Do not touch, inhale, or drink. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling. When using the product, do not eat, drink, or smoke.
Contact evasion:	In item of "10. Stability and Reactivity" reference.
Storage	
Safe storage conditions:	Avoid contact with heat, Strong alkali, and reducing agents. Store in a well-ventilated, cool location. Lock the storage location. Technical measures: Store hazardous materials in their storage location, and install the lighting, illumination, and ventilation necessary for handling.
Container and packing materials:	Airtight containers (glass, polyethylene, etc.)

## 8. Exposure Avoidance and Protection Measures

Control concentration:	No information
Tolerable concentration:	
Japan Society for Occupational Health (2014)	2ppm, 5.2mg/m <sup>3</sup> (*As the nitric acid described above)
ACGIH (2014)	2ppm (TLV-TWA) (*As the nitric acid described above)
Equipment Measures:	Install local exhausters, and eye and hand washing facilities, in the handling locations.
Protective Equipment	
Respirator:	Wear suitable respirator. (dust masks, etc.)
Hand protective equipment:	Wear protective gloves. (Rubber gloves, etc.)
Eye protective equipment:	Wear eye protective equipment. (Goggles, etc.)
Skin and body protective equipment:	Wear protective face equipment, clothing, and protective shoes, etc. (Protective clothing, protective boots, etc.)

## 9. Physical and Chemical Properties

Physical properties	
Shape:	Liquid
Color:	Reddish-brown
Odor:	Slight nitric acid odor
Odor threshold value:	No information
pH:	No information
Melting point and coagulation point:	No information
Boiling point, initial boiling point, and boiling range:	No information
Ignition Point:	No information
Vaporization speed (butyl acetate=1):	No information

## MSDS-26 Palladium Nitrate Solution (4/6)

Burnability (solids and gas):	No information
Explosion range:	No information
Vapor pressure:	No information
Vapor density (vapor=1):	No information
Specific gravity (density):	No information
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

Reactivity:	No information
Stability:	Stable at normal temperatures
Possibility of harmful reactions:	Reduced to metal palladium by a strongly reducing agent. Contact with metals and exposure to high temperatures causes NOx gas to be emitted. Has properties that oxidize other substances, and so when mixed with flammable substances, may dissolve due to heat/shock/friction, etc., to cause fierce burning.
Conditions to be avoided:	Heat
Incompatible substances:	Reducing agents, Strong alkali
Hazardous degradation products:	Nitrogen oxides

### 11. Harmfulness Information

Acute toxicity:	
Oral:	There are reports that when PdCl <sub>2</sub> is given to mice as drinking water, growth is retarded, and malignant lung tumors are caused, but cannot classify it because it is lacking in data.
Pass; skin:	When soluble palladium chloride is injected into rats, large amounts cause necrosis in the receiving parts, but cannot classify it because it is lacking in data.
Inhalation:Gas	The definition of GHS is a liquid.
Inhalation:Steam	Rat : LC50; 334ppm (As HNO <sub>3</sub> )
Inhalation:Dust,Mist	No data available
Skin corrosiveness and irritation:	A liquid and the steam show severe damage characteristics for skin of the Homo sapiens.(As HNO <sub>3</sub> ) Damaged for skin in short exposure.(As HNO <sub>3</sub> ) As a result of having applied the 8% solution of this material to a rabbit, necrosis was seen.(As HNO <sub>3</sub> )
Critical injury to eyes and eye irritation:	Damage cornea and cause the restorative visual disorder that there is not.(As HNO <sub>3</sub> ) A severe chemical burn is caused for eyes of the Homo sapiens, and ocular reduction, the eyelid adhesion, the restorative corneal clouding that there is not lead to loss of eyesight.(As HNO <sub>3</sub> )
Respiratory organ sensitivity:	No data available
Skin sensitivity:	No data available
Germ-cell mutagenicity:	No data available
Carcinogenicity:	No data available
Reproductive toxicity:	No data available
Specific marker organs and systemic toxicity (single exposure):	In the Homo sapiens, oral cavity, the esophagus, corrosion necrosis, pneumonia of the stomach are reported by cough, headache, nausea, pain in the chest, dyspnea, bronchoconstriction, respiratory obstacle, edema of the lungs, the oral exposure by the inhalational exposure.(As HNO <sub>3</sub> ) In inhalational revelation of rat 8ppm (0.02 mg/L), there is the report of pulmonary edema at widespread inflammation, nasal inflammation, bronchitis, pneumonia, 49ppm (0.12 mg/L) of the respiratory tract.(As HNO <sub>3</sub> )

## MSDS-26 Palladium Nitrate Solution (5/6)

Specific marker organs and systemic toxicity (repeated exposure):	The dental erosion of the tooth was seen in inhalational three of 32 people exposed to professionally.(As HNO <sub>3</sub> ) The repetition revelation to steam and a mist produces chronic bronchitis. The severe revelation case produces chemical pneumonia and erodes with teeth particularly cuspid and incisor.(As HNO <sub>3</sub> )
Inhalable respiratory organ harmfulness:	No data available

## 12. Environmental Impact Information

Ecotoxicity	
Aquatic environmental harm (acute hazard):	No data available
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:

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

International Regulations	
UN No.:	3093
Proper Shipping Name:	CORROSIVE LIQUID, OXIDIZING, N.O.S.
Class:	5.1 (8)
Sub Risk:	-
Packing Group:	Class II
Marine Pollutant:	-
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	No
Japanese Regulations	
Land Regulations Information:	Obey Poisonous and Deleterious Substances Control Law and Fire Services Act regulations.
Maritime Regulations Information:	Obey Ship Safety Law regulations.
Aviation Regulations Information:	Obey the Civil Aeronautics Law.
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

Industrial Safety and Health Law:	Hazardous material (oxidizing substance)
Ordinance on Prevention of Hazards due to Specified Chemical Substances:	Specified chemical substances (Class 3)
Act on Port Regulations:	Hazardous material (oxidizing substance)
Regulations for the carriage and storage of dangerous goods in ship:	Corrosive substance

## 16. Other Information

### 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)

### \*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)