

# Palladium(II) Chloride Solution

Safety Data Sheet

## Section 1: Identification

### 1.1 Identification

Product Name : Palladium(II) Chloride Solution

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

Use of the substance/mixture : Catalyst

### 1.3 Details of the supplier of the safety data sheet

Nano3D Systems LLC  
1110 NE Circle Blvd., ATAMI/Bldg. 11  
Corvallis, OR 97330

### 1.4 Emergency telephone number

Emergency number Chemtrec : 800-424-9300

## Section 2: Hazard(s) identification

### 2.1 Classification of the substance or mixture

#### Classification (GHS-US)

Flammable liquids (Category 2)	H225
Acute toxicity, Oral (Category 3)	H301
Corrosive to metals (Category 1)	H290
Skin sensitization (Category 1)	H317
Eye irritation (Category 2A)	H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system	H336

### 2.2 Label elements

#### GHS-US labeling

Hazard pictogram (GHS-US)



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H225 – Highly flammable liquid and vapor  
: H290- May be corrosive to metals  
: H301 – Toxic if swallowed  
: H317 – May cause allergic skin reaction  
: H319 – Causes serious eye irritation  
: H336 – May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statements (GHS-US) : P210 – Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
: P233 – Keep container tightly closed.

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- : P240 – Ground/bond container and receiving equipment.
- : P241 – Use explosion-proof electrical/ ventilating/ lighting/ equipment
- : P242 – Use only non-sparking tools.
- : P243 – Take precautionary measures against static discharge.
- : P261 – Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
- : P264 – Wash hands thoroughly after handling
- : P270 – Do not eat, drink or smoke when using this product
- : P271 – Use only outdoors or in a well-ventilated area.
- : P272 – Contaminated work clothing should not be allowed out of the workplace
- : P280 – Wear protective gloves/protective clothing/ eye protection/face protection
- : P301+310 – If swallowed: Immediately call a poison center or doctor/physician.
- : P302 +P352 – If on skin: Wash with plenty of soap and water.
- : P303+P361+P353 – If on skin (or hair) Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- : P304+P340 – If inhaled: Remove person to fresh air and keep comfortable for breathing
- : P305+P351+P338 – If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- : P312 – Call a POISON CENTER/doctor if you feel unwell.
- : P321 – Specific treatment (see supplemental first aid instructions on this label).
- : P330 – Rinse mouth.
- : P333+P313 – If skin irritation or rash occurs: Get medical advice/attention.
- : P337+P313 – If eye irritation persists: Get medical advice/attention.
- : P363 – Wash contaminated clothing before reuse.
- : P370+P378 – In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
- : P403+P233 – Store in a well-ventilated place. Keep container tightly closed.
- : P405 – Store locked up.
- : P501 – Dispose of contents/container to an approved waste disposal plant.

### 2.3 Other Hazards

May form explosive peroxides

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## 2.4 Unknown acute toxicity (GHS US)

No additional information available

## Section 3: Composition/information on ingredients

### 3.1 Substance

Not applicable

### 3.2 Mixture

Name	Product Identifier	%	Classification (GHS-US)
Isopropyl alcohol	(CAS-No.) 67-63-0	Trade Secret	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336
Palladium(II) Chloride	(CAS-No.) 7647-10-1	Trade Secret	Acute Tox. 3; Eye Irrit. 2A; Skin Sens. 1; H301, H317, H319
Hydrochloric acid	CAS-No.) 7647-01-0	Trade Secret	Corrosive to metals. 1; Eye irrit. 2A; Skin Sens. 1

## Section 4: First Aid Measures

### 4.1 Description of first aid measures

General	: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
Inhalation	: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin contact	: Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
Eye contact	: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
Ingestion	: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician

### 4.2 Most important symptoms and effects, both acute and delayed

Inhalation	: No information available
Skin contact	: No information available

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Eye contact : No information available

Ingestion : No information available

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

No further information available

## Section 5: Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media : None

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

Fire hazard : Flammable, hydrogen chloride gas release

Explosion hazard : Vapors form explosive mixture with air

### 5.3 Advice for firefighters

Protection during firefighting : Wear self-contained breathing apparatus for firefighting if necessary.

## Section 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel : Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

6.1.2 For emergency personnel : No additional information available

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### 6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

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### Section 7: Handling and storage

#### 7.1 Precautions for safe handling

Precautions for safe handling

: Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge.

#### 7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

: Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Handle and store under inert gas. hygroscopic

### Section 8: Exposure controls/personal protection

#### 8.1 Control parameters

Isopropyl Alcohol (CAS-No.) 67-63-0		
TWA	980.00 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
Palladium(II) Chloride (CAS-No.) 7647-10-1		
No occupational exposure limit values		
Hydrochloric Acid (CAS.No.) 7647-01-0		

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Component	CAS-No.	Value	Control parameters	Basis
Hydrochloric acid	7647-01-0	C	2.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		C	5.000000 ppm 7.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Often used in an aqueous solution.		
		C	5.000000 ppm 7.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		
		C	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		C	5 ppm 7 mg/m3	USA. NIOSH Recommended Exposure Limits
		Often used in an aqueous solution.		
		C	5 ppm 7 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		
		C	5 ppm 7 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

### 8.2 Exposure controls

<b>Appropriate engineering controls</b>	: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
<b>Hand protection</b>	: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
<b>Eye protection</b>	: Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
<b>Skin and body protection</b>	: Complete suit protecting against chemicals, the type of protective equipment must be selected

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	according to the concentration and amount of the dangerous substance at the specific workplace.
<b>Respiratory protection</b>	: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

## Section 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Deep-Orange
Odor	: alcohol-like
Odor threshold	: No information available
pH	: No information available
Melting point	: -89.5 °C (Isopropanol)
Freezing point	: -89.5 °C (Isopropanol)
Boiling point	: 82 °C (Isopropanol)
Flash point	: 12.0 °C (Isopropanol)
Relative evaporation rate (butyl acetate = 1)	: 3.0
Flammability (solid, gas)	: No information available
Explosion limits	: 2 – 12.7 % (V)
Explosive properties	: No information available
Vapor pressure	: 32.4 mmHg @ 20 °C
Relative density	: No information available
Relative density at 20 °C	: 0.785 g/cm <sup>3</sup>
Water Solubility	: Miscible
Log Pow	: 0.05
Auto-ignition temperature	: 425 °C
Viscosity	: No information available
Viscosity, kinematic	: No information available
Viscosity, dynamic	: No information available

### 9.2 Other information

No further information available

## Section 10: Stability and reactivity

### 10.1 Reactivity

No information available

### 10.2 Chemical Stability

Stable under recommended storage conditions.

Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard

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after 1 year.

## 10.3 Possibility of hazardous reactions

Vapors may form explosive mixture with air.

## 10.4 Conditions to avoid

Heat, flames and sparks. Extremes of temperature and direct sunlight.

## 10.5 Incompatible materials

Oxidizing agents, Acid anhydrides, Aluminum, Halogenated compounds, Acids

## 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides  
Other decomposition products – Titanium oxides

## Section 11: Toxicological information

### 11.1 Control parameters

Acute toxicity : No information available

#### Isopropyl Alcohol (CAS-No.) 67-63-0

LD50 Oral - Rat - 5,045 mg/kg

LC50 Inhalation - Rat - 8 h - 16000 ppm

LD50 Dermal - Rabbit - 12,800 mg/kg

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

LD50 Oral - rat - 2,704 mg/kg

LD50 Oral - mouse - > 1,000 mg/kg

LD50 Oral - rat - 200 mg/kg

Skin corrosion/irritation : Mild skin irritation

Serious eye damage/irritation : Eye irritation

Respiratory or skin sensitization : No information available

Germ cell mutagenicity : Human, lymphocyte, DNA inhibition

Carcinogenicity : Carcinogenicity - mouse - Oral  
Tumorigenic: Carcinogenic by RTECS criteria.  
Lungs, Thorax, or Respiration: Tumors. Blood:  
Tumors.

Reproductive toxicity : Rat – Intratesticular  
Paternal Effects: Spermatogenesis (including



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genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Mouse – Subcutaneous

Paternal Effects: Testes, epididymis, sperm duct.

Specific target organ toxicity (single exposure) : Inhalation, Oral - May cause drowsiness or dizziness.

Specific target organ toxicity (repeated exposure) : No information available

Aspiration hazard : No information available

### Additional information

Central nervous system depression, prolonged or repeated exposure can cause: Nausea, Headache, Vomiting, narcosis, Drowsiness, Overexposure may cause mild, reversible liver effects., Aspiration may lead to: Lung oedema, Pneumonia. Contact with skin can cause: Dermatitis, Allergic reactions

## Section 12: Ecological information

### 12.1 Toxicity

#### Isopropyl Alcohol (CAS-No.) 67-63-0

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 9,640.00 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 5,102.00 mg/l - 24 h Immobilization EC50 - Daphnia magna (Water flea) - 6,851 mg/l - 24 h
Toxicity to algae	EC50 - Desmodesmus subspicatus (green algae) - > 2,000.00 mg/l - 72 h EC50 - Algae - > 1,000.00 mg/l - 24 h

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

No information available

### 12.2 Persistence and degradability

#### Isopropyl Alcohol (CAS-No.) 67-63-0

No information available

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

No information available

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### 12.3 Bioaccumulative potential

#### Isopropyl Alcohol (CAS-No.) 67-63-0

No bioaccumulation is to be expected ( $\log Pow \leq 4$ ).

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

No information available

### 12.4 Mobility in soil

#### Isopropyl Alcohol (CAS-No.) 67-63-0

No information available

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

No information available

### 12.4 Other adverse effects

No information available

## Section 13: Disposal considerations

### 13.1 Waste treatment methods

#### Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

#### Contaminated packaging

Dispose of as unused product.

## Section 14: Transportation information

### 14.1 Transportation information

#### Department of Transportation (DOT)

UN number: 1219 Class: 3 Packing group: II

Proper shipping name: Isopropanol solution

Reportable Quantity (RQ):

Poison Inhalation Hazard: No

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## Section 15: Regulatory information

### 15.1 US Federal regulations

#### Isopropyl Alcohol (CAS-No.) 67-63-0

SARA Title III, Sections 302, 311, 312, 313

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

SARA Title III, Sections 302, 311, 312, 313

### 15.2 US State regulations

#### Isopropyl Alcohol (CAS-No.) 67-63-0

Massachusetts Right To Know

Pennsylvania Right To Know

New Jersey Right To Know

#### Palladium(II) Chloride (CAS-No.) 7647-10-1

Pennsylvania Right To Know

New Jersey Right To Know

## Section 16: Other information

### HMIS Rating

Health	2
Chronic Health	*
Flammability	3
Physical	0

### NFPA Rating

Health	3
Fire	3
Reactivity	0

**SDS Preparation date:** September 10, 2017    **Supersedes previous version:** New SDS

**This SDS contains revisions in the following sections(s):** Not applicable. New SDS.

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End of Safety Data Sheet