SAFETY DATA SHEET

According to JIS Z 7253:2019
Issue Date 15-May-2025
Revision Number 1.08

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name	Chloro(2-dicyclohexylphosphino-2',4',6'-triisopropyl-1,1'-biphenyl)[2-(2'-amino-1,1'-biphenyl)]palladium(II), Tetrahydrofuran Adduct [Manufacturer:Johnson Matthey]
Product Code	032-24961,038-24963,036-24964

Manufacturer Johnson Matthey

Supplier FUJIFILM Wako Pure Chemical Corporation
1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan
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Recommended uses For research use only

Restrictions on use Seek expert judgment when using for purposes other than those recommended.

Section 2: HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 2
Reproductive Toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 1, Category 3
Category 1 central nervous system	
Category 3 Respiratory irritation	
Specific target organ toxicity (repeated exposure)	Category 1
Category 1 central nervous system, respiratory system, liver, nervous system	
Aspiration hazard	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 2

Pictograms

Signal word Danger

Hazard statements

H315 - Causes skin irritation
H319 - Causes serious eye irritation
H351 - Suspected of causing cancer
H361 - Suspected of damaging fertility or the unborn child

H335 - May cause respiratory irritation
H304 - May be fatal if swallowed and enters airways
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects
H370 - Causes damage to the following organs: central nervous system
H372 - Causes damage to the following organs through prolonged or repeated exposure: central nervous system, respiratory system, liver, nervous system

Precautionary statements-(Prevention)
- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Wash face, hands and any exposed skin thoroughly after handling
- Do not breathe dust/fume/gas/mist/vapors/spray
- Do not eat, drink or smoke when using this product
- Use only outdoors or in a well-ventilated area
- Avoid release to the environment

Precautionary statements-(Response)
- IF exposed: Call a POISON CENTER or doctor/physician
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- If eye irritation persists: Get medical advice/attention
- IF ON SKIN: Wash with plenty of soap and water
- If skin irritation occurs: Get medical advice/attention
- Take off contaminated clothing and wash before reuse
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- Call a POISON CENTER or doctor/physician if you feel unwell
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- Do NOT induce vomiting
- Collect spillage

Precautionary statements-(Storage)
- Store locked up
- Store in a well-ventilated place. Keep container tightly closed

Precautionary statements-(Disposal)
- Dispose of contents/container to an approved waste disposal plant

Others
Other hazards Not available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Single Substance or Mixture Mixture

Chemical Name	Weight-%	Molecular weight	ENCS	ISHL No.	CAS RN
Chloro(2-dicyclohexylphosphino-2',4',6'-triisopropyl-1,1'-biphenyl)[2-(2'-amino-1,1'-biphenyl)]palladium(II)	90	786.80	N/A	N/A	1310584-14-5
n-Heptane	10	100.20	(2)-7	*	142-82-5
Tetrahydrofuran	10	72.11	(5)-53	*	109-99-9

Note on ISHL No.: * in the table means announced chemical substances.

Impurities and/or Additives： Impurities : n-Heptane
Substances Remarks: Tetrahydrofuran Adduct

Section 4: FIRST AID MEASURES

Inhalation
Remove to fresh air. If symptoms persist, call a physician.
Skin contact
Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.
Eye contact
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate medical attention is required.
Ingestion
Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice.
Protection of first-aiders
Use personal protective equipment as required.

Section 5: FIRE FIGHTING MEASURES

Suitable extinguishing media
Water spray (fog), Carbon dioxide (CO2), Foam, Extinguishing powder, Sand
Unsuitable extinguishing media
No information available
Specific hazards arising from the chemical product
Thermal decomposition can lead to release of irritating and toxic gases and vapors.
Special extinguishing method
No information available
Special protective actions for fire-fighters
Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind.
Environmental precautions
To be careful not discharged to the environment without being properly handled waste water contaminated.
Methods and materials for contaminent and methods and materials for cleaning up
Sweep up and gather scattered particles, and collect it in an empty airtight container.
Recoverly, neutralization
No information available
Secondary disaster prevention measures
Clean contaminated objects and areas thoroughly observing environmental regulations.

Section 7: HANDLING AND STORAGE

Handling
Technical measures
Avoid contact with strong oxidizing agents. Use with local exhaust ventilation.
Precautions
Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging. Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle. In places other than those specified, should not be smoking or eating and drinking. Should not be brought

contaminated protective equipment and gloves to rest stops. Deny unnecessary entry of non-emergency personnel to the handling area.

Safety handling precautions

Avoid contact with skin, eyes or clothing. Use personal protective equipment as required.

Storage

Safe storage conditions

Storage conditions Keep container protect from light, store in well-ventilated place at room temperature (preferably cool). Keep container tightly closed. Packed with an inert gas.

Safe packaging material Glass

Incompatible substances Strong oxidizing agents

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand- and eye-wash facility. And display their position clearly.

Exposure limits

Chemical Name	JSOH (Japan)	ISHL (Japan)	ACGIH
n-Heptane 142-82-5	TWA: 200 ppm OEL TWA: 820 mg/m³ OEL	N/A	STEL: 500 ppm TWA: 400 ppm
Tetrahydrofuran 109-99-9	TWA: 50 ppm OEL TWA: 148 mg/m³ OEL Skin	ISHL/ACL: 50 ppm	STEL: 100 ppm TWA: 50 ppm Skin

Chemical Name	Concentration standard value set by the Minister of Health, Labor and Welfare (8hr)	Concentration standard value set by the Minister of Health, Labor and Welfare (Short-Term)
n-Heptane 142-82-5	500 ppm	N/A

Personal protective equipment

Respiratory protection Dust mask (JIS T 8151)

Hand protection chemical protective gloves (JIS T 8116)

Eye protection protective eyeglasses or chemical safety goggles (JIS T 8147)

Skin and body protection Long-sleeved work clothes

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.

If this product is classified as ”Chemical Substances Hazardous to Skin, etc.”, use appropriate protective equipment to them.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Form

Color White - slight brown

Appearance powder or mass

Odor no data available

Melting point/freezing point no data available

Boiling point, initial boiling point and boiling range no data available

Flammability no data available

Evaporation rate: no data available

Flammability (solid, gas): no data available

Upper/lower flammability or explosive limits

Upper：	no data available
Lower：	no data available
Flash point	no data available
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH	no data available
Viscosity (coefficient of viscosity)	no data available
Dynamic viscosity	no data available
Solubilities	Ethanol and acetone : soluble . water : practically insoluble .
n-Octanol/water partition coefficient:(log Pow)	no data available
Vapour pressure	no data available
Specific Gravity / Relative density	no data available
Vapour density	no data available
Particle characteristics	no data available

Section 10: STABILITY AND REACTIVITY

Stability

Reactivity	no data available
Chemical stability	May be altered by light.

Hazardous reactions

None under normal processing

Conditions to avoid

Extremes of temperature and direct sunlight

Incompatible materials

Strong oxidizing agents

Hazardous decomposition products

Carbon monooxide (CO), Carbon dioxide (CO2), Nitrogen oxides (NOx), Phosphorus oxide, Halides, Metal oxides

Section 11: TOXICOLOGICAL INFORMATION

*NITE: National Institute of Technology and Evaluation (JAPAN)
https://www.chem-info.nite.go.jp/en/chem/chrip/chrip_search/srhInput

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
n-Heptane	5,000 mg/kg (Mouse)	3,000 mg/kg (Rabbit)	103 g/m^3 (Rat)
Tetrahydrofuran	2000 mg/kg (Rat)	> 2000 mg/kg (Rat)	18187 ppm (Rat) 4 h

Chemical Name	Acute toxicity -oral- source information	Acute toxicity -dermal- source information	Acute toxicity -inhalation gas- source information
n-Heptane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Chemical Name	Acute toxicity -inhalation vapor- source information	Acute toxicity -inhalation dust- source information	Acute toxicity -inhalation mist- source information
n-Heptane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Skin irritation/corrosion

Chemical Name	Skin corrosion/irritation source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Serious eye damage/ irritation

Chemical Name	Serious eye damage/irritation source information

n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Respiratory or skin sensitization

Chemical Name	Respiratory or Skin sensitization source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Reproductive cell mutagenicity

Chemical Name	germ cell mutagencity source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Carcinogenicity

Chemical Name	Carcinogenicity source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Chemical Name	NTP	IARC	ACGIH	JSOH
Tetrahydrofuran 109-99-9	N/A	Group 2B	A3	-

Reproductive toxicity

Chemical Name	Reproductive toxicity source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

STOT-single exposure

Chemical Name	STOT -single exposure- source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

STOT-repeated exposure

Chemical Name	STOT -repeated exposure- source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Aspiration hazard

Chemical Name	Aspiration Hazard source information
n-Heptane	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.

Section 12: ECOLOGICAL INFORMATION

*NITE: National Institute of Technology and Evaluation (JAPAN)
https://www.chem-info.nite.go.jp/en/chem/chrip/chrip_search/srhInput

Ecotoxicity

Chemical Name	Algae/aquatic plants	Fish	Crustacea
n-Heptane	*N/A*	*LC50 : Cichlid Fish 375.0 mg/L 96 h*	*LC50 : Mysidopsis bahia 0.1 mg/L 96 h*
Tetrahydrofuran	*LC50 : Pimephales Promelas 2160 mg/L 96 h*	*LC50 : Fathead minnow 2160 mg/L 96 h*	*EC50 : Daphnia magna 5930 mg/L 48 h*

Other data

Chemical Name	Short-term (acute) hazardous to the aquatic environment source information	Long-term (chronic) hazardous to the aquatic environment source information
n-Heptane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Tetrahydrofuran	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Persistence and degradability	No information available
Bioaccumulative potential	No information available
Mobility in soil	No information available
Hazard to the ozone layer	No information available

Section 13: DISPOSAL CONSIDERATIONS

Waste from residues

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated container and contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

ADR/RID

UN number	UN3077
Proper shipping name:	Environmentally hazardous substance, solid, n.o.s. (n-Heptane Mixture)
UN classfication	9
Subsidiary hazard class	
Packing group	III
Marine pollutant	Yes

IMDG

UN number	UN3077
Proper shipping name:	Environmentally hazardous substance, solid, n.o.s. (n-Heptane Mixture)
UN classfication	9
Subsidiary hazard class	
Packing group	III
Marine pollutant (Sea)	Yes
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available

IATA

UN number	UN3077
Proper shipping name:	Environmentally hazardous substance, solid, n.o.s. (n-Heptane Mixture)
UN classfication	9
Subsidiary hazard class	
Packing group	III
Environmentally Hazardous Substance	Yes

Section 15: REGULATORY INFORMATION

Japanese regulations

Fire Service Act	Not applicable
Poisonous and Deleterious Substances Control Law	Not applicable
Industrial Safety and Health Act	Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57) Notifiable Substances (Law Art.57-2) Class 2 Organic Solvents (Enforcement Order Attached Table No.6-2, Ordinance on Prevention of Organic Solvent Poisoning Art.1, Para.1, Item 5) Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1) Chemical Substances Hazardous to Skin, etc.(Regulations Article 594-2 Paragraph 1)
Regulations for the carriage	Noxious Substances (Ordinance Art.3, Ministry of Transportation Ordinance Regarding

and storage of dangerous goods in ship	Transport by Ship and Storage, Attached Table 1)
Civil Aeronautics Law	Misellaneous Dangerous Substances and Articles (Ordinance Art.194, MITL Nortification for Air Transportation of Explosives etc., Attached Table 1)
Pollutant Release and Transfer Register Law (2023.4.1-)	Class 1
Class 1 - No.	674,731

Chemical Name	Poisonous and Deleterious Substances Control Law	Industrial Safety and Health Act Substances (Law Art.57-2)	Pollutant Release and Transfer Register Law (2023.4.1-)
Tetrahydrofuran 109-99-9 (10)	-	Applicable	Applicable
n-Heptane 142-82-5 (10)	-	Applicable	Applicable

Section 16: OTHER INFORMATION

Key literature references and sources for data etc.

NITE: National Institute of Technology and Evaluation (JAPAN)
https://www.chem-info.nite.go.jp/en/chem/chrip/chrip_search/srhInput
IATA dangerous Goods Regulations
RTECS:Registry of Toxic Effects of Chemical Substances
Japan Industrial Safety and Health Association GHS Model SDS
Dictionary of Synthetic Oraganic Chemistry , SSOCJ, Koudansha Scientific Co.Ltd.
Chemical Dictionary, Kyouritsu Publishing Co., Ltd.
etc

Record of SDS revisions

The following contents were revised. Hazards identification. Composition/information on ingredients. Exposure controls/personal protection. Stability and reactivity. Toxicological information. Transport information. Regulatory information.

Disclaimer

This SDS is according to JIS Z 7253: 2019. 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, 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.
GHS Classification is according to JIS Z 7252:2019. *JIS: Japanese Industrial Standards

End of Safety Data Sheet