

tetramminepalladium(II) hydrogen carbonate

## Section 1. Identification

Code: C4076

GHS product identifier: tetramminepalladium(II) hydrogen carbonate

Chemical name: tetraammine palladium (II) hydrogen carbonate

Other means of identification: Palladium(2+), tetraammine-, (SP-4-1)-, carbonate (1:2)

Product type: Solid.

Relevant identified uses of the substance or mixture and uses advised against: Not applicable.

Supplier's details: Johnson Matthey, 2001 Nolte Drive, West Deptford, NJ 08066 USA

Emergency telephone number (with hours of operation): For Hazardous Materials [or Dangerous Goods] Incident, Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night (collect calls accepted).  
Within USA and Canada: 1-800-424-9300. Outside USA and Canada: +1 703-527-3887

## Section 2. Hazards identification

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture ACUTE TOXICITY (oral) - Category 4  
SERIOUS EYE DAMAGE - Category 1  
SKIN SENSITIZATION - Category 1  
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

### GHS label elements

Hazard pictograms



Signal word **Danger**

Hazard statements Harmful if swallowed.  
Causes serious eye damage.  
May cause an allergic skin reaction.  
May cause damage to organs through prolonged or repeated exposure.

### Precautionary statements

Prevention Wear protective gloves or clothing and eye or face protection. Avoid breathing dust. Avoid release to the environment.

Response IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.

Storage Not applicable.

Disposal Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified None known.

## Section 3. Composition/information on ingredients

Substance/mixture Substance

Chemical name tetraammine palladium (II) hydrogen carbonate

Other means of identification Palladium(2+), tetraammine-, (SP-4-1)-, carbonate (1:2)

### CAS number/other identifiers

CAS number 134620-00-1

Product code C4076

## Section 3. Composition/information on ingredients

Ingredient name	%	CAS number
tetraammine palladium (II) hydrogen carbonate	100	134620-00-1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

<b>Eye contact</b>	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
<b>Inhalation</b>	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Skin contact</b>	Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

<b>Eye contact</b>	Causes serious eye damage.
<b>Inhalation</b>	No known significant effects or critical hazards.
<b>Skin contact</b>	May cause an allergic skin reaction.
<b>Ingestion</b>	Harmful if swallowed.

#### Over-exposure signs/symptoms

<b>Eye contact</b>	Adverse symptoms may include the following: pain watering redness
<b>Inhalation</b>	No specific data.
<b>Skin contact</b>	Adverse symptoms may include the following: pain or irritation redness blistering may occur
<b>Ingestion</b>	Adverse symptoms may include the following: stomach pains

### Indication of immediate medical attention and special treatment needed, if necessary

<b>Notes to physician</b>	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
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## Section 4. First aid measures

Specific treatments	No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

Suitable extinguishing media Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media None known.

Specific hazards arising from the chemical No specific fire or explosion hazard.

Hazardous thermal decomposition products Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides  
metal oxide/oxides

Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Remark Not available.

Remark Not available.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

For non-emergency personnel No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

Small spill Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

Protective measures Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

## Section 7. Handling and storage

<b>Advice on general occupational hygiene</b>	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
<b>Conditions for safe storage, including any incompatibilities</b>	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

tetraammine palladium (II) hydrogen carbonate	None.
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<b>Appropriate engineering controls</b>	If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
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<b>Environmental exposure controls</b>	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
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### Individual protection measures

<b>Hygiene measures</b>	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
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<b>Eye/face protection</b>	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
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### Skin protection

<b>Hand protection</b>	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
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<b>Body protection</b>	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
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<b>Other skin protection</b>	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
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<b>Respiratory protection</b>	Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
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## Section 9. Physical and chemical properties

<b>Physical state</b>	Solid. [Crystalline solid.]	<b>Melting point</b>	Decomposition temperature: 181°C (357.8°F)
<b>Color</b>	White to yellowish.	<b>Boiling point</b>	Not available.
<b>Odor</b>	Not available.	<b>Flash point</b>	Not available.
<b>Odor threshold</b>	Not available.	<b>Burning time</b>	Not available.
<b>Vapor pressure</b>	Not available.	<b>Burning rate</b>	Not available.
<b>Vapor density</b>	Not available.	<b>Flammability (solid, gas)</b>	Not available.

## Section 9. Physical and chemical properties

Evaporation rate	Not available.	Lower and upper explosive (flammable) limits	Not available.
Relative density	Not available.	Auto-ignition temperature	Not available.
pH	Not available.	Decomposition temperature	181°C (357.8°F)
Partition coefficient: n-octanol/water	<1	SADT	Not available.
Solubility in water	56.2 g/l	Viscosity	Not available.
Solubility	Not available.		

## Section 10. Stability and reactivity

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data.
Incompatible materials	No specific data.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
tetraammine palladium (II) hydrogen carbonate	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat - Female	Single dose 933 mg/kg	-

Conclusion/Summary Harmful if swallowed.

#### Irritation/Corrosion

Not available.

#### Conclusion/Summary

Skin	Not available.
Eyes	Causes serious eye damage.
Respiratory	Not available.

#### Sensitization

Not available.

#### Conclusion/Summary

Skin	May cause an allergic skin reaction.
Respiratory	Not available.

#### Mutagenicity

Product/ingredient name	Test	Experiment	Result
tetraammine palladium (II) hydrogen carbonate	-	Experiment: In vitro Subject: Mammalian-Human	Positive
	OECD 471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/Summary Not available.

#### Carcinogenicity

Not available.

Conclusion/Summary Not available.

#### Reproductive toxicity

Not available.

Conclusion/Summary Not available.

## Section 11. Toxicological information

### Teratogenicity

Not available.

Conclusion/Summary Not available.

### Specific target organ toxicity (single exposure)

Not available.

### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
tetraammine palladium (II) hydrogen carbonate	Category 2	Not determined	Not determined

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** Routes of entry anticipated: Dermal.  
Routes of entry not anticipated: Oral, Inhalation.

### Potential acute health effects

Eye contact	Causes serious eye damage.
Inhalation	No known significant effects or critical hazards.
Skin contact	May cause an allergic skin reaction.
Ingestion	Harmful if swallowed.

### Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	Adverse symptoms may include the following: pain watering redness
Inhalation	No specific data.
Skin contact	Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	Adverse symptoms may include the following: stomach pains

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

#### Long term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

### Potential chronic health effects

Not available.

Conclusion/Summary Not available.

General May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.



## Section 11. Toxicological information

**Interactive effects** Not available.

**Other information** Not available.

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
tetraammine palladium (II) hydrogen carbonate	Acute EC50 0.22 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 0.53 mg/l Fresh water	Fish	96 hours

**Conclusion/Summary** Very toxic to aquatic organisms. Very toxic to aquatic life with long lasting effects.

### Persistence and degradability

Not available.

**Conclusion/Summary** Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
tetraammine palladium (II) hydrogen carbonate	<1	-	low

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** >3.39

**Mobility** Not available.

**Other adverse effects** No known significant effects or critical hazards.

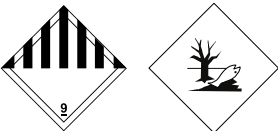
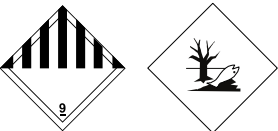
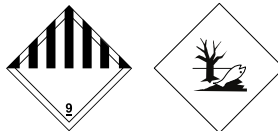
## Section 13. Disposal considerations

**Disposal methods** The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Waste stream** Not available.

**RCRA classification** Not available.

## Section 14. Transport information

	DOT Classification	IMDG	IATA
<b>UN number</b>	UN3077	UN3077	UN3077
<b>UN proper shipping name</b>	Environmentally hazardous substance, solid, n.o.s. (Palladium Compound, solid)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N. O.S. (Palladium Compound, solid)	Environmentally hazardous substance, solid, n.o.s. (Palladium Compound, solid)
<b>Transport hazard class(es) and Packing group</b>	9 III 	9 III 	9 III 

## Section 14. Transport information

Environmental hazards	Yes.	Yes.	Yes.
<b>Additional information</b>	<p>Non-bulk packages of this product are not regulated as hazardous materials unless transported by inland waterway. This product is not regulated as a hazardous material when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.</p> <p><b>Limited quantity</b> Yes.</p> <p><b>Special provisions</b> 8, 146, 335, B54, IB8, IP3, N20, T1, TP33</p>	<p>This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.</p> <p><b>Emergency schedules (EmS)</b> F-A, S-F</p> <p><b>Special provisions</b> 274, 335</p>	<p>This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.</p> <p><b>Passenger and Cargo Aircraft</b> Quantity limitation: 400 kg Packaging instructions: 956</p> <p><b>Cargo Aircraft Only</b> Quantity limitation: 400 kg Packaging instructions: 956</p> <p><b>Limited Quantities - Passenger Aircraft</b> Quantity limitation: 30 kg Packaging instructions: Y956</p> <p><b>Special provisions</b> A97, A158, A179</p>

Special precautions for user Avoid exposure. ERG No. 171

Transport in bulk according to Annex II of MARPOL and the IBC Code

Not available.

Proper shipping name Not available.

Ship type Not available.

Pollution category Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) Not listed

Clean Air Act Section 602 Class I Substances Not listed

Clean Air Act Section 602 Class II Substances Not listed

DEA List I Chemicals (Precursor Chemicals) Not listed

DEA List II Chemicals (Essential Chemicals) Not listed

### SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ Not applicable.

### SARA 311/312

Classification Immediate (acute) health hazard

Delayed (chronic) health hazard

**Composition/information on ingredients**



## Section 15. Regulatory information

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
tetraammine palladium (II) hydrogen carbonate	100	No.	No.	No.	Yes.	Yes.

### State regulations

Massachusetts	This material is not listed.
New York	This material is not listed.
New Jersey	This material is not listed.
Pennsylvania	This material is not listed.
	Not available.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol (Annexes A, B, C, E)

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### International lists

#### National inventory

Australia	Not determined.
Canada	This material is not listed in DSL but is listed in NDSL.
China	Not determined.
Europe	Not determined.
Japan	<b>Japan inventory (ENCS):</b> Not determined. <b>Japan inventory (ISHL):</b> This material is listed or exempted.
Malaysia	Not determined.
New Zealand	Not determined.
Philippines	Not determined.
Republic of Korea	Not determined.
Taiwan	This material is listed or exempted.
Turkey	Not determined.

## Section 16. Other information

### Procedure used to derive the classification

Classification	Justification
ACUTE TOXICITY (oral) - Category 4	Expert judgment
SERIOUS EYE DAMAGE - Category 1	Expert judgment
SKIN SENSITIZATION - Category 1	On basis of test data
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Expert judgment

### History




Date of printing 10/01/2017

## Section 16. Other information

Date of issue/Date of revision	10/01/2017
Date of previous issue	29/11/2016
Version	3
Prepared by	Not available.
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
References	Not available.

 Indicates information that has changed from previously issued version.

US Label (29 CFR 1910.1200(f)(1))

<b>tetramminepalladium(II) hydrogen carbonate</b>	  
CAS: 134620-00-1      Code: C4076	
<b>Danger</b>	
Harmful if swallowed. Causes serious eye damage. May cause an allergic skin reaction. May cause damage to organs through prolonged or repeated exposure.	
Wear protective gloves or clothing and eye or face protection. Avoid breathing dust. Avoid release to the environment. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention. Dispose of contents and container in accordance with all local, regional, national and international regulations. Read SDS before using this product. Do not handle until all safety precautions have been read and understood.	
Johnson Matthey 2001 Nolte Drive, West Deptford, NJ 08066 USA non-emergencies: +1 856 384 7050; emergencies +1 800 424 9300	

### Notice to reader

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