MATERIAL IDENTIFICATION

NAME: 1,1'-Bis(Diphenylphosphino)ferrocene-palladium(II) dichloride dichloromethane complex

CAS#: [95464-05-4]
CAT#: 048593
For R&D use only.

HAZARDS IDENTIFICATION

GHS Classification
Acute toxicity, oral (Category 4)
Acute toxicity, dermal (Category 4)
Skin corrosion/irritation (Category 2)
Serious eye damage/eye irritation (Category 2A)
Acute toxicity, inhalation (Category 4)
Respiratory tract irritation (Category 3)
Carcinogenicity (Category 2)
Specific target organ toxicity, single exposure (Category 2)

GHS Label organ toxicity, including precautionary statements

Pictograms

Signal Word Warning

Hazard Statement(s)
H302 Harmful if swallowed
H312 Harmful in contact with skin
H315 Causes skin irritation
H319 Causes serious eye irritation
H332 Harmful if inhaled
H335 May cause respiratory irritation
H351 Suspected of causing cancer
H373 Causes damage to organs through prolonged or repeated exposure
Precautionary Statement(s)

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P312 IF SWALLOWED: call a POISON CENTER or doctor/physician IF you feel unwell.
P302 + P352 IF ON SKIN: wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P332 + P313 IF SKIN irritation occurs: Get medical advice/attention.
P337 + P313 IF eye irritation persists: Get medical advice/attention.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Pd(dppf)Cl2 · CH2Cl2, Pd(dppf)Cl2 · DCM
Formula : C35H30Cl4FeP2Pd
Molecular Weight : 816.64 g/mol

<table>
<thead>
<tr>
<th>CAS</th>
<th>Description</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>95464-05-4</td>
<td>[1,1'-Bis(diphenylphosphino)ferrocene]dichloropalladium(II), complex with dichloromethane</td>
<td>70-90%</td>
</tr>
<tr>
<td>75-09-2</td>
<td>Methylene chloride</td>
<td>10-30%</td>
</tr>
</tbody>
</table>

FIRST AID MEASURES

In case of eye contact
Immediately flush eyes with running water for at least 15 minutes while keeping eyes open. Seek medical attention.

In case of skin contact
Wash thoroughly with soap and plenty of water. Seek medical attention.

If inhaled
Remove victim from source of exposure to fresh air. If breathing is difficult, administer oxygen. Seek medical attention.

If swallowed
Do not induce vomiting. Give water to victim to drink. Seek medical attention.

FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use carbon dioxide, dry chemical powder, alcohol-resistant or polymer foam.
Special protective equipment for fire-fighters
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Unusual fire and explosion hazards/decomposition of product
emits toxic fumes under fire conditions.

ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing fumes, vapors, mists or gas. Ventilate area. Rent sources of ignition. Evacuate personnel.

Environmental precautions
Prevent further leakage if safe to do so.

Methods and materials for containment and clean up
Absorb spills on sand or vermiculite and place in closed container for disposal.

HANDLING AND STORAGE

Precautions for safe handling
Avoid prolonged use. Avoid all direct contact with material. Do not breathe dust or vapor. Wash thoroughly after handling.

Precautions for safe storage
Keep container tightly closed. Store in a cool, dry, well-ventilated area.

EXPOSURE CONTROL/PERSONAL PROTECTION

Exposure Limits:

<table>
<thead>
<tr>
<th>Component Name (CAS)</th>
<th>Reference</th>
<th>TWA ppm</th>
<th>mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene chloride (75-09-2)</td>
<td>OSHA</td>
<td>25</td>
<td>--</td>
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</table>

Personal protective equipment

Eye/face protection
Wear protective safety goggles or face shields tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Hand/skin protection
Avoid all direct contact with product.
Wear chemical-resistant gloves.
Wear protective clothing and boots.
After contact with skin, wash immediately.

Respiratory protection
Ensure adequate ventilation during use. Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the exposure limits.

PHYSICAL AND CHEMICAL PROPERTIES

1,1’-Bis(Diphenylphosphino)ferrocene-palladium(II)
Appearance: Red to brown powder
Odour: no data available
Odour Threshold: no data available
Melting point/Freezing Point: 275-280°C
Boiling Point: no data available
Flash Point: no data available
Evaporation Rate: no data available
Flammability (solid, gas): no data available
Upper/Lower Flammability or Explosive limits: no data available
Vapour pressure: no data available
Relative Density: no data available
Solubility(ies): no data available
Partition coefficient: n-octanol/water: no data available
Auto-ignition temperature: no data available
Decomposition temperature: no data available
Viscosity: no data available
Refractive Index: no data available

STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
no data available

Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products
May evolve carbon monoxide, carbon dioxide, phosphorus oxides, hydrogen chloride, and hydrogen fluoride.

TOXICOLOGICAL INFORMATION

Acute toxicity
Skin corrosion/irritation
Causes skin irritation

Serious eye damage/eye irritation
Causes serious eye irritation

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity
Reproductive toxicity
no data available

STOT-single exposure
Respiratory system

STOT-repeated exposure
Oral - Blood, Liver
Inhalation - Central nervous system

Aspiration hazard
no data available

Exposure Routes
May be harmful to skin, eyes, and respiratory system.
May have harmful effects if inhaled or swallowed.

To the best of our knowledge, the health hazards of this material have not been fully investigated.

ECOLOGICAL INFORMATION

Toxicity
no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
no data available

DISPOSAL CONSIDERATIONS

Dissolve in or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all Federal, State and local laws.

TRANSPORT INFORMATION

DOT
Classed non-hazardous for shipping.

IMDG
Classed non-hazardous for shipping.

IATA
REGULATORY INFORMATION

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: The following chemicals in this material are subject to the reporting requirements of SARA Title III, Section 313:

<table>
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New Jersey Right to Know Components
This product contains a chemical on the New Jersey Right to Know Components List.

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California Prop. 65 Components
WARNING! This product contains a chemical known to the State of California to cause cancer, birth defects, or any other reproductive harm.

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OTHER INFORMATION

Version : 1.3
Revision Date : 12/19/2017

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. Oakwood shall not be held liable for any damage resulting from handling or from contact with the above product.