1. IDENTIFICATION OF SUBSTANCE AND OF THE COMPANY

Product name: Dicobalt octacarbonyl (Stabilised with 1-5% hexane)
Product code: EO04080
Company: INTATRADE Chemicals GmbH
Bahnhofstr. 1
06774 Muldestausee OT Friedersdorf, Germany
Phone: +49 3493/605464
Fax: +49 3493/605470
e-mail: intatrade@intatrade.de

2. HAZARDS IDENTIFICATION

Hazard designation: T+ Very toxic
Information pertaining to particular dangers for man and environment:
R 22 Harmful if swallowed.
R 26 Very toxic by inhalation.
R 40 Limited evidence of a carcinogenic effect.
R 43 May cause sensitisation by skin contact.
R 62 Possible risk of impaired fertility.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

GHS label elements

Danger
H330 Fatal if inhaled.

Warning
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.
H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Prevention:
P273 Avoid release to the environment.
P280 Wear protective gloves/clothing.

Response:
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.
P310 Immediately call a POISON CENTER or doctor/physician.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Designation: Dicobalt octacarbonyl (CAS-No.: 10210-68-1); 95-99%
Hexane (CAS-No.: 110-54-3); 1-5%
EC-No.: 233-514-0

EO04080 www.intatrade.de

Printed: 27.10.2015
4. FIRST AID MEASURES

General information
- Instantly remove any clothing soiled by the product.
- Remove breathing apparatus only after soiled clothing has been completely removed.
- In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation
- Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
- Seek immediate medical advice.

After skin contact
- Instantly wash with water and soap and rinse thoroughly.
- Seek immediate medical advice.

After eye contact
- Rinse opened eye for several minutes under running water. Then consult doctor.

After swallowing
- Seek immediate medical advice.

5. FIRE FIGHTING MEASURES

Suitable extinguishing agents
- CO₂, sand, extinguishing powder.

Special hazards caused by the material, its products of combustion or flue gases:
- Carbon monoxide and carbon dioxide
- Toxic metal oxide smoke

Protective equipment:
- Wear self-contained breathing apparatus.
- Wear full protective suit.

6. ACCIDENTAL RELEASE MEASURES

Person-related safety precautions:
- Wear protective equipment. Keep unprotected persons away.
- Ensure adequate ventilation
- Keep away from ignition sources

Measures for environmental protection:
- Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting:
- Dispose of contaminated material as waste according to item 13.
- Ensure adequate ventilation.

Additional information:
- See Section 7 for information on safe handling
- See section 8 for information on personal protection equipment
- See Section 13 for information on disposal

7. HANDLING AND STORAGE

Handling
Information for safe handling:
- Handle under dry protective gas.
- Keep containers tightly sealed.
- Store in cool, dry place in tightly closed containers.
- Ensure good ventilation/exhaustion at the workplace.
- Open and handle container with care.

Information about protection against explosions and fires:
- Keep ignition sources away - Do not smoke.
- Protect against electrostatic charges.

Storage
Requirements to be met by storerooms and containers:
- Store in cool location.

Information about storage in one common storage facility:
- Store away from oxidizing agents.
- Store away from air.
- Store under dry inert gas.
- Keep container tightly sealed.
- Store in cool, dry conditions in well sealed containers.
8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Additional information about design of technical systems: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with critical values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt carbonyl</td>
<td>mg/m³</td>
</tr>
<tr>
<td>ACGIH TLV</td>
<td>0.1</td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>0.1</td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>0.1</td>
</tr>
<tr>
<td>France TWA</td>
<td>0.1</td>
</tr>
<tr>
<td>Hungary TWA</td>
<td>0.01; 0.02 STEL</td>
</tr>
<tr>
<td>Netherlands TWA</td>
<td>0.1</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>ppm</td>
</tr>
<tr>
<td>ACGIH TLV</td>
<td>50 (skin)</td>
</tr>
<tr>
<td>Austria MAK</td>
<td>50</td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>50</td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>25</td>
</tr>
<tr>
<td>Finland TWA</td>
<td>50; 150-STEL</td>
</tr>
<tr>
<td>France VME</td>
<td>50</td>
</tr>
<tr>
<td>Germany MAK</td>
<td>50</td>
</tr>
<tr>
<td>Hungary TWA</td>
<td>100; 200-STEL</td>
</tr>
<tr>
<td>Japan OEL</td>
<td>40 (skin)</td>
</tr>
<tr>
<td>Korea TLV</td>
<td>50 (skin)</td>
</tr>
<tr>
<td>Netherlands MAC-TGG</td>
<td>25</td>
</tr>
<tr>
<td>Norway TWA</td>
<td>25</td>
</tr>
<tr>
<td>Poland TWA</td>
<td>100; 400-STEL</td>
</tr>
<tr>
<td>Russia TWA</td>
<td>40; 300-STEL</td>
</tr>
<tr>
<td>Sweden NGV</td>
<td>25; 50-KTV</td>
</tr>
<tr>
<td>Switzerland MAK-W</td>
<td>50; 100-KZG-W</td>
</tr>
<tr>
<td>United Kingdom TWA</td>
<td>20</td>
</tr>
<tr>
<td>USA PEL</td>
<td>500</td>
</tr>
</tbody>
</table>

Additional information: No data

Personal protective equipment: The usual precautionary measures should be adhered to in the chemicals.

General protective and handling hygienic measures: Keep away from foodstuffs, beverages and food. Instantly remove any soiled and impregnated garments. Wash hands during breaks and at the end of the work. Store protective clothing separately.

Breathing equipment: Use breathing protection with high concentrations.

Eye protection: Face protection

Body protection: Protective work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES:

General Information

Form: Crystalline
Colour: Red-orange
Smell: Type specific

Change in condition

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range</td>
<td>ca 51°C (dec)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>Not determined</td>
</tr>
<tr>
<td>Sublimation temperature / start</td>
<td>Not determined</td>
</tr>
<tr>
<td>Property</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Flash point:</td>
<td>-13°C</td>
</tr>
<tr>
<td>Inflammability (solid, gaseous)</td>
<td>Highly flammable</td>
</tr>
<tr>
<td>Ignition temperature:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Decomposition temperature:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Critical values for explosion:</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Upper:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Steam pressure:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Density at 20°C</td>
<td>1.73 g/cm³</td>
</tr>
<tr>
<td>Solubility in / Miscibility with</td>
<td></td>
</tr>
<tr>
<td>Water:</td>
<td>Insoluble</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

Materials to be avoided: Air

Oxidizing agents

Dangerous reactions: Self igniting

Dangerous products of decomposition: Carbon monoxide and carbon dioxide

Toxic metal oxide smoke

### 11. TOXICOLOGICAL INFORMATION

**Acute toxicity:**

- Oral: LD50 378 mg/kg (mouse) (RTECS)
  - 754 mg/kg (rat) (RTECS)
- Inhalative: LC50 165 mg/m³ (rat) (RTECS)
  - LC50/2H 26.9 mg/m³/2H (mouse) (RTECS)

**Primary irritant effect:**

- on the skin: May cause irritation
- on the eye: May cause irritation

**Sensitization:**

Sensitization possible by skin contact.

**Additional toxicological information:**

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Possible risk of impaired fertility.

IARC-2B: Possibly carcinogenic to humans: limited evidence in humans in the absence of sufficient evidence in experimental animals.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this product.

Sensitisation

May cause sensitisation by skin contact.

### 12 ECOLOGICAL INFORMATION:

**Ecotoxicological effects:**

Harmful to aquatic organisms

**Remark:**

Additional ecological information:

Generally not hazardous for water.

Do not allow material to be released to the environment without proper governmental permits.

Harmful to aquatic organisms

### 13. DISPOSAL CONSIDERATIONS

**Product:**

**Recommendation:** Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations. Consult state, local or national regulations for proper disposal.

Uncleaned packagings: Recommendation: Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

Land transport ADR/RID and GGVS/GGVE (cross-border/domestic)
Kemler Number: 664
UN-Number: 3466
Packaging group: II
Label 6.1
Designation of goods: 3466 TOXIC SOLID, N.O.S. (Octacarbonyldicobalt)
Limited quantities (LQ) LQ0
Tunnel restriction code D/E

Maritime transport IMDG/GGVSea:
IMDG/GGVSea Class: 6.1
UN Number: 3466
Label 6.1
Packaging group: II
Marine pollutant: No
Correct technical name: TOXIC SOLID, N.O.S. (Octacarbonyldicobalt)

Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class: 6.1
UN/ID Number: 3466
Label 6.1
Packaging group: II
Correct technical name: TOXIC SOLID, N.O.S. (Octacarbonyldicobalt)

UN "Model Regulation": UN 3466, METAL CARBONYLS, SOLID, N.O.S., class 6.1, P.G. II

15. REGULATORY INFORMATION

Designation according to EC guidelines:
Code letter and hazard designation of product: T+ Very toxic
Risk phrases:
11 Highly flammable.
22 Harmful if swallowed.
26 Very toxic by inhalation.
40 Limited evidence of a carcinogenic effect.
43 May cause sensitisation by skin contact.
62 Possible risk of impaired fertility.
52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases:
28 After contact with skin, wash immediately with plenty of soap and water.
36/37 Wear suitable protective clothing and gloves.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
61 Avoid release to the environment. Refer to special instructions/safety data sheets.

National regulations
Information about limitation of use: Employment restrictions concerning young persons must be observed. Employment restrictions concerning women of child-bearing age must be observed.
Water hazard class: Generally not hazardous for water.

16. OTHER INFORMATION:

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Intatrade Chemicals GmbH shall not be held liable for any damage resulting from handling or from contact with the above product.