# 1 Identification of the substance/mixture and of the company/undertaking

**Product identifier**

Product name: **Cobalt(II) nitrate hexahydrate**  
Stock number: 36418  
CAS Number: 10026-22-9  
EC number: 233-402-1  
Index number: 027-009-00-2  

**Details of the supplier of the safety data sheet**

Manufacturer/Supplier:  
Alfa Aesar, A Johnson Matthey Company  
Johnson Matthey Catalog Company, Inc.  
30 Bond Street  
Ward Hill, MA 01835-8099  
Tel: 800-343-0660  
Fax: 800-322-4757  
Email: tech@alfa.com  
www.alfa.com  

Information Department: Health, Safety and Environmental Department  
Emergency telephone number:  
During normal hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

# 2 Hazards identification

**Classification of the substance or mixture**

**Classification according to Regulation (EC) No 1272/2008**

- **GHS03** Flame over circle  
  Ox. Sol. 2  H272 May intensify fire; oxidizer.

- **GHS08** Health hazard  
  Resp. Sens. 1  H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
  Muta. 2  H341 Suspected of causing genetic defects.
  Carc. 1B  H350 May cause cancer.
  Repr. 1B  H360 May damage fertility or the unborn child.

- **GHS07** Skin Sens. 1  H317 May cause an allergic skin reaction.

**Classification according to Directive 67/548/ECC or Directive 1999/45/EC**

- **T**; Toxic  
  R49-60: May cause cancer by inhalation. May impair fertility.

- **Xn**; Harmful  
  R68: Possible risk of irreversible effects.

- **Xn**; Sensitizing  
  R42/43: May cause sensitization by inhalation and skin contact.

- **N**; Dangerous for the environment  
  R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Information concerning particular hazards for human and environment:** Not applicable

**Label elements**

**Labelling according to Regulation (EC) No 1272/2008**

The substance is classified and labelled according to the CLP regulation.

(Contd. on page 2)
Product name: Cobalt(II) nitrate hexahydrate

Hazard pictograms

GHS03  GHS08

Signal word Danger

Hazard statements
H272 May intensify fire; oxidizer.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.

Precautionary statements
P221 Take any precaution to avoid mixing with combustibles.
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P385 In case of inadequate ventilation wear respiratory protection.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard description:

WHMIS classification
C - Oxidizing materials
D2A - Very toxic material causing other toxic effects

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

| HEALTH  | 2 | Health (acute effects) = 2 |
| FIRE    | 0 | Flammability = 0 |
| REACTIVITY | 2 | Reactivity = 2 |

Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:
10026-22-9 Cobalt(II) nitrate hexahydrate
Identification number(s):
EC number: 233-402-1
Index number: 027-009-00-2

4 First aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact
Immediately 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 a doctor.

After swallowing Seek medical treatment.

Information for doctor

Most important symptoms and effects, both acute and delayed
Nausea
Dizziness
5 Firefighting measures

Extinguishing media

Suitable extinguishing agents
Product is not flammable. Use fire fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:

Advice for firefighters

Protective equipment:

Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation

Environmental precautions:

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

Methods and material for containment and cleaning up:

Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

Reference to other sections

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling

Precautions for safe handling
Handle under dry argon.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.

Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities

Storage

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Store away from metals.

Further information about storage conditions:

Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s) No further relevant information available.

8 Exposure controls/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.

Control parameters

Components with limit values that require monitoring at the workplace:

Cobalt, elemental & inorganic compounds, as Co

<table>
<thead>
<tr>
<th>Country</th>
<th>Limit Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH TLV</td>
<td>0.02</td>
<td>Confirmed animal carcinogen</td>
</tr>
<tr>
<td>Austria</td>
<td>Carcinogen</td>
<td></td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Finland TWA</td>
<td>0.05 (skin)</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Carcinogen</td>
<td></td>
</tr>
<tr>
<td>Hungary TWA</td>
<td>0.1; 0.2-STEL</td>
<td></td>
</tr>
<tr>
<td>Japan OEL</td>
<td>0.05; 2B-Carcinogen</td>
<td></td>
</tr>
<tr>
<td>Korea TLV</td>
<td>0.02</td>
<td>Confirmed animal carcinogen</td>
</tr>
<tr>
<td>Netherlands MAC-TGG</td>
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<td></td>
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</tbody>
</table>
### 9 Physical and chemical properties

#### Information on basic physical and chemical properties

**General Information**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Crystalline powder</td>
</tr>
<tr>
<td><strong>Form</strong></td>
<td>Crystalline powder</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Red</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Odorless</td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>Not determined</td>
</tr>
</tbody>
</table>

**pH-value:** Not applicable.

<table>
<thead>
<tr>
<th>Change in condition</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Melting point/Melting range</strong></td>
<td>55-56°C (131-133 °F)</td>
</tr>
<tr>
<td><strong>Boiling point/Boiling range</strong></td>
<td>Not determined</td>
</tr>
<tr>
<td><strong>Sublimation temperature / start</strong></td>
<td>Not determined</td>
</tr>
</tbody>
</table>

**Flash point:** Not applicable.

**Flammability (solid, gaseous):** Not determined.

**Ignition temperature:** Not determined.

**Decomposition temperature:** Not determined.

**Auto igniting:** Not determined.

**Danger of explosion:** Product does not present an explosion hazard.

**Explosion limits:** Not determined.

<table>
<thead>
<tr>
<th><strong>Lower</strong></th>
<th><strong>Upper</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

**Vapor pressure:** Not applicable.

**Density at 20°C (68 °F):** 1.87 g/cm³ (15.605 lbs/gal)

**Relative density:** Not determined.

**Vapor density:** Not applicable.

**Evaporation rate:** Not applicable.

**Solubility in / Miscibility with:**

- Water at 0°C (32 °F): 1338 g/l

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Kinematic</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**Other information**

No further relevant information available.
10 Stability and reactivity

Reactivity

Chemical stability

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions: No dangerous reactions known

Hazardous decomposition products:
Nitrogen oxides
Metal oxide fume

11 Toxicological information

Information on toxicological effects

Acute toxicity:
Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.

Sensitization:
Sensitization possible through inhalation.
Sensitization possible through skin contact.

Subacute to chronic toxicity:
Cobalt is an experimental neoplastigen and tumorigen. It is an experimental carcinogen of the connective tissue and lungs. Cobalt metal and inorganic compounds are classified as an animal carcinogen by the ACGIH. Ingestion may cause burning in the mouth, esophagus, and stomach. Inhalation of dusts and fumes may cause irritation of the respiratory tract and labored breathing and coughing. Sensitization, nausea, flushing of the face and ringing in the ears is also possible. Chronic ingestion may result in pericardial effusion, polycardial effusion, cardiac failure, vomiting, convulsions and thyroid enlargement. Small doses of nitrates may cause weakness, general depression, headache and mental impairment. Larger doses may cause dizziness, abdominal cramps, vomiting, bloody diarrhea, convulsions and collapse.

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

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

ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

12 Ecological information

Toxicity

Aquatic toxicity: No further relevant information available.

Persistence and degradability: No further relevant information available.

Behavior in environmental systems:

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Ecotoxicological effects:

Remark: Very toxic for aquatic organisms

Additional ecological information:

General notes:
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Do not allow material to be released to the environment without proper governmental permits.
May cause long lasting harmful effects to aquatic life.

Very toxic for aquatic organisms

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

Other adverse effects: No further relevant information available.
13 Disposal considerations

Waste treatment methods
Recommendation: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>DOT, ADR, IMDG, IATA</th>
</tr>
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<tbody>
<tr>
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<td>UN1477</td>
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</table>

<table>
<thead>
<tr>
<th>UN proper shipping name</th>
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</thead>
<tbody>
<tr>
<td>DOT, IMDG, IATA</td>
</tr>
<tr>
<td>ADR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
</tr>
<tr>
<td>Class: 5.1 Oxidising substances.</td>
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<tr>
<td>Label: 5.1</td>
</tr>
<tr>
<td>ADR</td>
</tr>
<tr>
<td>Class: 5.1 (O2) Oxidizing substances</td>
</tr>
<tr>
<td>Label: 5.1</td>
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<tr>
<td>IMDG, IATA</td>
</tr>
<tr>
<td>Class: 5.1 Oxidising substances.</td>
</tr>
<tr>
<td>Label: 5.1</td>
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</table>

<table>
<thead>
<tr>
<th>Packing group</th>
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</thead>
<tbody>
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<td>DOT, ADR, IMDG, IATA</td>
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<td>III</td>
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</table>

<table>
<thead>
<tr>
<th>Environmental hazards:</th>
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</thead>
<tbody>
<tr>
<td>Environmentally hazardous substance, solid; Marine Pollutant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marine pollutant:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special marking (ADR):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol (fish and tree)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special precautions for user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger code (Kemler):</td>
</tr>
<tr>
<td>Warning: Oxidizing substances</td>
</tr>
<tr>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UN &quot;Model Regulation&quot;:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1477, NITRATES, INORGANIC, N.O.S. (Cobalt(II) nitrate hexahydrate), ENVIRONMENTALLY HAZARDOUS, 5.1, III</td>
</tr>
</tbody>
</table>

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).
Information about limitation of use:
For use only by technically qualified individuals.
This product contains cobalt and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

Other regulations, limitations and prohibitive regulations
Substances of very high concern (SVHC) according to REACH, Article 57
Substance is not listed.

REACH - Pre-registered substances Substance is listed.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact:
Zachariah C. Holt
Global EHS Manager

Abbreviations and acronyms:
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DCT: US Department of Transportation
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)