1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code: C1325
Product Name: COBALT SULFATE, CRYSTAL, REAGENT
Chemical Name: Cobalt(II) sulfate (1:1), heptahydrate
Synonyms: Cobalt monosulfate heptahydrate
Cobalt(II) sulphate heptahydrate
Cobaltous sulfate heptahydrate
Sulfuric acid, cobalt(2+) salt (1:1), heptahydrate (8CI,9CI)

Recommended use: In cobalt-electroplating baths. In storage batteries. As a drier for lithographic inks, paints, varnishes. In ceramics, pigments, glazes, enamels to prevent discoloration.

CAS #: 10026-24-1
Formula: CoSO4.7H2O
RTECS #: GG3200000
CI#: Not available
Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000
Order Online At: https://www.spectrumchemical.com
Emergency Telephone Number: CHEMTREC: 1-800-424-9300
Contact Person: Regina Wachenheim (East Coast)
Contact Person: Martin LaBenz (West Coast)

2. HAZARDS IDENTIFICATION

See Section 8.
2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Carcinogen Status:</th>
</tr>
</thead>
</table>
| Cobalt Sulfate heptahydrate 10026-24-1 (100) | A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans by ACGIH  
2B- Possibly Carcinogenic to Humans by IARC  
Evidence of Carcinogenicity by NTP  
OSHA - Hazard Communication Carcinogens - Present |

**OSHA Regulatory Status**
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)***

**POTENTIAL HEALTH EFFECTS**

**Principal Routes of Exposure:**
Ingestion. Inhalation.

**Acute Potential Health Effects:**

**Skin Contact:**
Causes skin irritation. May cause allergic skin reaction.

**Eye Contact:**
Causes eye irritation.

**Inhalation:**
May cause irritation of respiratory tract. May cause allergic respiratory reaction***

**Ingestion:**
May be harmful if swallowed. May cause abdominal pain. May cause hypermotility, diarrhea. May cause vomiting. May cause central nervous system effects. May affect the cardiovascular system. It may affect the thyroid. May affect the blood. May affect respiration. It may affect the kidneys. May affect the bone marrow***

**Chronic Potential Health Effects:**

**Target Organs:**
Thyroid. Lungs. Bone Marrow. Heart. Blood***

**Mutagenic Effects:**
May affect genetic material  
Experiments with bacteria and/or yeast have shown mutagenic effects  
Animal experiments showed mutagenic effects  
Mutagenic effects on mammalian germ cells

**Teratogenic Effects:**
No information available

**Aggravated Medical Conditions:**
No information available

See Section 11 for additional Toxicological Information
POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>10026-24-1</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention.

Eye Contact: Flush eye with water for 15 minutes. Get medical attention.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. In case of shortness of breath, give oxygen. Obtain medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention***

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

<table>
<thead>
<tr>
<th>Flashpoint (°C/°F):</th>
<th>No information available.</th>
</tr>
</thead>
</table>

Flash Point Tested according to: Not applicable

<table>
<thead>
<tr>
<th>Lower Explosion Limit (%)</th>
<th>No information available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Explosion Limit (%)</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Autoignition Temperature (°C/°F): No information available

Suitable Extinguishing Media: The product is not flammable. The product itself does not burn. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.

Hazardous Combustion Products: Not applicable

Specific hazards: The product is not flammable. This material is an inorganic dust/powder and will not create nor support conditions that would result in a dust explosion or fire.
Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Specific Methods: No information available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Avoid dust formation.

Environmental Precautions:
No information available.

Methods for Cleaning Up:
Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling
Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Do not ingest. Do not breathe vapours/dust. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

Storage
Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Materials:
Oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protective Equipment
Eye protection: Safety glasses. Safety glasses with side-shields.
Skin and body protection: Long sleeved clothing. Chemical resistant apron. Gloves.
Respiratory protection: Wear respirator with dust filter.

Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

National occupational exposure limits

United States
U.S Occupational Exposure Limits: Not determined

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
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</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate - 10026-24-1</td>
<td>None</td>
<td>None</td>
<td>0.02 mg/m³ TWA (as Co)</td>
<td>None</td>
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</tbody>
</table>

Canada
Canada Occupational Exposure Limits: Not determined

<table>
<thead>
<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
</tr>
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<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate 10026-24-1</td>
<td>0.02 mg/m³ TWA (as Co)</td>
<td>0.02 mg/m³ TWA (as Co)</td>
<td>0.02 mg/m³ TWA (as Co)</td>
<td>0.02 mg/m³ TWAEV (as Co)</td>
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</table>

Australia and Mexico
Occupational Exposure Limits for Australia and Mexico: Not determined

<table>
<thead>
<tr>
<th>Components</th>
<th>Australia</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate 10026-24-1</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES
9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Solid***

**Odor:** Odorless***

**Flash point (°C):** Not applicable

**Autoignition Temperature (°C/F):** No information available

**pH:** No information available

**Density (g/cm3):** No information available

**Evaporation rate:** No information available

**Odor threshold (ppm):** No information available

**Solubility:**
- Soluble in Water
- Slightly soluble in Methanol
- Slightly soluble in Ethanol***

**Appearance:** Crystals***

**Molecular/Formula weight:** 281.10***

**Decomposition temperature(°C/F):** No information available

**Specific gravity:** 1.95***

**Flash point (°C):** Not applicable

**Evaporation rate:** No information available

**Color:** Red***

**Odor:** Odorless***

**Molecular/Formula weight:** 281.10***

**Boiling point/range(°C/F):** No information available

**Odor:** Odorless***

**Density (g/cm3):** No information available

**Bulk density:** No information available

**Vapor density:** No information available

**Partition coefficient (n-octanol/water):** No information available

**Miscibility:** No information available

**Solubility:**
- Soluble in Water
- Slightly soluble in Methanol
- Slightly soluble in Ethanol***

10. STABILITY AND REACTIVITY

**Stability:** Stable at normal conditions

**Conditions to avoid:** Heat. Avoid dust formation. Incompatible materials.

**Incompatible Materials:** Oxidizing agents.

**Hazardous decomposition products:** Sulphur oxides.

**Possibility of Hazardous Reactions:** Reacts violently with strong oxidants causing fire and explosion hazard.

**Polymerization:** Hazardous polymerisation does not occur

**Corrosivity:** No information available

**Special Remarks on Corrosivity:** No information available

11. TOXICOLOGICAL INFORMATION

**Acute Toxicity**

**Component Information**

*Cobalt Sulfate heptahydrate - 10026-24-1*

**Product code:** C1325  **Product name:** COBALT SULFATE, CRYSTAL, REAGENT
LD50/oral/rat = 582 mg/kg (RTECS)
768 mg/kg (European Commission IUCLID Dataset)
LD50/oral/mouse = No information available
LD50/dermal/rat = No information available
LD50/dermal/rabbit = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = No information available

Product Information

Local Effects
Skin irritation: Causes skin irritation.
Eye irritation: Causes eye irritation.
Inhalation: May cause irritation of respiratory tract. Can cause dyspnea (shortness of breath and difficulty breathing)***
Ingestion: May be harmful if swallowed. May cause abdominal pain. May cause vomiting. May cause hypermotility, diarrhea. May affect behavior/central nervous system (tremor, convulsions). May affect behavior/central nervous system (somnolence, ataxia). May affect urinary system (kidneys). May affect metabolism (weight loss or decreased weight gain)***
Sensitization: May cause sensitization by inhalation and skin contact

Chronic Toxicity

Chronic Toxicity
Prolonged or repeated ingestion may affect the blood (polycythemia). Prolonged or repeated ingestion may affect the bone marrow. Prolonged or repeated ingestion may affect the heart/cardiovascular system (cardiomyopathy, cardiomegaly, hypotension, low pulse rate, heart failure). Prolonged or repeated ingestion may cause edema of the ankles. Prolonged or repeated ingestion may cause cyanosis. Prolonged or repeated ingestion may affect respiration (dyspnea - shortness of breath and difficulty breathing). Prolonged or repeated ingestion may affect the thyroid (thyroid hypofunction). Prolonged or repeated inhalation may cause asthma-like allergy and asthma attacks with shortness of breath, wheezing, coughing, and/or chest tightness. Prolonged or repeated skin contact may cause allergic reaction. Prolonged or repeated inhalation may affect the blood (pigmented or nucleated red blood cells). Prolonged or repeated inhalation may affect the lungs, bronchi, trachea. Prolonged or repeated inhalation may affect the thymus gland***

Carcinogenic effects: Possibly carcinogenic to humans.

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA HCS - Carcinogens</th>
<th>ACGIH - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
</table>

Product code: C1325  
Product name: COBALT SULFATE, CRYSTAL, REAGENT
Cobalt Sulfate heptahydrate | Evidence of Carcinogenicity | Present | A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Cobalt inorganic compounds) | Not listed | Not listed

Mutagenic Effects: May affect genetic material
Experiments with bacteria and/or yeast have shown mutagenic effects
Animal experiments showed mutagenic effects
Mutagenic effects on mammalian germ cells

Reproductive Effects: Experiments have shown reproductive toxicity effects on laboratory animals
May cause adverse reproductive effects based on animal test data
May cause harm to the unborn child

Teratogenic Effects: No information available

Target Organs: Thyroid. Lungs. Bone Marrow. Heart. Blood***

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available.

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
UN-No: Not regulated

Product code: C1325 Product name: COBALT SULFATE, CRYSTAL, REAGENT
15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>Not Listed</td>
<td>Present</td>
<td>Not present</td>
<td>Not present</td>
<td>Present</td>
<td>Present</td>
<td>Not present</td>
</tr>
</tbody>
</table>

U.S. Regulations

Cobalt Sulfate heptahydrate

New Jersey RTK Hazardous Substance List: Present (listed under Cobalt compounds)
New Jersey (EHS) List: Present (listed under Cobalt compounds)
New Jersey - Discharge Prevention - List of Hazardous Substances: Present (listed under Cobalt compounds)
Pennsylvania RTK: Present (listed under Cobalt compounds)
Pennsylvania RTK - Environmental Hazard List: Present (listed under Cobalt compounds)
Minnesota - Hazardous Substance List: Present (listed under Cobalt inorganic compounds)


Chemicals Known to the State of California to Cause Cancer:
WARNING: This product contains a chemical known to the State of California to cause cancer. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>carcinogen</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>N096 (Cobalt compounds)</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
D2A Very toxic materials
D2B Toxic materials ***

Cobalt Sulfate heptahydrate
D2A  D2B
Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

EU Classification

**R-phrase(s)**
- R22 - Harmful if swallowed.
- R42 - May cause sensitization by inhalation.
- R43 - May cause sensitization by skin contact.
- R49 - May cause cancer by inhalation.
- R60 - May impair fertility.
- R68 - Possible risk of irreversible effects.
- R50 - Very toxic to aquatic organisms.
- R53 - May cause long-term adverse effects in the aquatic environment.

**S-phrase(s)**
- S53 - Avoid exposure - obtain special instructions before use.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S60 - This material and its container must be disposed of as hazardous waste.
- S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Sulfate heptahydrate</td>
<td>For Cobalt Sulfate (CAS no. 10124-43-3)</td>
<td>For Cobalt Sulfate (CAS no. 10124-43-3)</td>
</tr>
<tr>
<td></td>
<td>R22</td>
<td>S53</td>
</tr>
<tr>
<td></td>
<td>R42/43</td>
<td>S45</td>
</tr>
<tr>
<td></td>
<td>Carc. Cat. 2; R49</td>
<td>S60</td>
</tr>
<tr>
<td></td>
<td>Repro. Cat. 2; R60</td>
<td>S61</td>
</tr>
<tr>
<td></td>
<td>Muta. Cat. 3; R68</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N; R50-53</td>
<td></td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**
- Xn - Harmful.
- N - Dangerous for the environment.
16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1/Z129.1-2010 standards.

Preparation Date: 22-Jul-2013
Reason for revision: Not applicable
Prepared by: Sonia Owen
Literature reference: No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.