SECTION 1: Identification of the substance/mixture and of the company/undertaking

· 1.1 Product identifier
· Trade name: Cobalt tricarbonyl nitrosyl
· Item number: 27-0500
· CAS Number: 14096-82-3
· EC number: 237-945-5

· 1.2 Relevant identified uses of the substance or mixture and uses advised against
No further relevant information available.

· 1.3 Details of the supplier of the safety data sheet
· Manufacturer/Supplier:
Strem Chemicals, Inc.
7 Mulliken Way
NEWBURYPORT, MA 01950
USA
info@strem.com

· Further information obtainable from: Technical Department

· 1.4 Emergency telephone number:
EMERGENCY: CHEMTREC: + 1 (800) 424-9300
During normal opening times: +1 (978) 499-1600

SECTION 2: Hazards identification

· 2.1 Classification of the substance or mixture
· Classification according to Regulation (EC) No 1272/2008

GHS02 flame
Flam. Liq. 2 H225 Highly flammable liquid and vapour.

GHS08 health hazard
Carc. 2 H351 Suspected of causing cancer.

GHS07
Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H312 Harmful in contact with skin.
Acute Tox. 4 H332 Harmful if inhaled.

· 2.2 Label elements
· Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.
Trade name: Cobalt tricarbonyl nitrosyl

- **Hazard pictograms**
  - GHS02
  - GHS07
  - GHS08

- **Signal word** Danger

- **Hazard-determining components of labelling:**
  - Cobalt tricarbonyl nitrosyl

- **Hazard statements**
  - H225 Highly flammable liquid and vapour.
  - H302+H312+H332 Harmful if swallowed, in contact with skin or if inhaled.
  - H351 Suspected of causing cancer.

- **Precautionary statements**
  - P101 If medical advice is needed, have product container or label at hand.
  - P102 Keep out of reach of children.
  - P103 Read label before use.
  - P231 Handle under inert gas.
  - P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  - P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
  - P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P422 Store contents under inert gas.
  - P403+P235 Store in a well-ventilated place. Keep cool.
  - P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
  - PBT: Not applicable.
  - vPvB: Not applicable.

### SECTION 3: Composition/information on ingredients

- **3.1 Chemical characterisation: Substances**
- **CAS No. Description**
  - 14096-82-3 Cobalt tricarbonyl nitrosyl
- **Identification number(s)**
  - EC number: 237-945-5

### SECTION 4: First aid measures

- **4.1 Description of first aid measures**
  - **General information:**
    Immediately remove any clothing soiled by the product.
    Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  - **After inhalation:**
    Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
    In case of unconsciousness place patient stably in side position for transportation.
  - **After skin contact:** Immediately rinse with water.

(Contd. on page 3)
Safety data sheet  
according to 1907/2006/EC, Article 31


Trade name: Cobalt tricarbonyl nitrosyl

(Contd. of page 2)

- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Call for a doctor immediately.
- 4.2 Most important symptoms and effects, both acute and delayed: No further relevant information available.
- 4.3 Indication of any immediate medical attention and special treatment needed: No further relevant information available.

SECTION 5: Firefighting measures

- 5.1 Extinguishing media
- Suitable extinguishing agents:
  CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- For safety reasons unsuitable extinguishing agents: Water with full jet
- 5.2 Special hazards arising from the substance or mixture: No further relevant information available.
- 5.3 Advice for firefighters
  - Protective equipment: Mouth respiratory protective device.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
- 6.2 Environmental precautions:
  Prevent seepage into sewage system, workpits and cellars.
- 6.3 Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
- 6.4 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.

SECTION 7: Handling and storage

- 7.1 Precautions for safe handling
  Ensure good ventilation/exhaustion at the workplace.
  Open and handle receptacle with care.
  Prevent formation of aerosols.
- Handling:
  Handle under inert gas.
- Information about fire - and explosion protection:
  Keep ignition sources away - Do not smoke.
  Protect against electrostatic charges.
  Keep respiratory protective device available.
- 7.2 Conditions for safe storage, including any incompatibilities
  Storage:
  Keep cool.
  Store contents under inert gas.
- Requirements to be met by storerooms and receptacles:
  Store in a cool location.
- Information about storage in one common storage facility:
  Not required.
- Further information about storage conditions:
  Keep container tightly sealed.
  Store in cool, dry conditions in well sealed receptacles.

(Contd. on page 4)
SECTION 8: Exposure controls/personal protection

- Additional information about design of technical facilities: No further data; see item 7.

- 8.1 Control parameters
  - Ingredients with limit values that require monitoring at the workplace: Not required.
  - Additional information: The lists valid during the making were used as basis.

- 8.2 Exposure controls
  - Personal protective equipment:
    - General protective and hygienic measures:
      Keep away from foodstuffs, beverages and feed.
      Immediately remove all soiled and contaminated clothing
      Wash hands before breaks and at the end of work.
      Store protective clothing separately.
      Avoid contact with the eyes and skin.
  - Respiratory protection:
    In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
  - Protection of hands:
    - Protective gloves
      The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
      Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
      Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  - Material of gloves
    The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
  - Penetration time of glove material
    The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
  - Eye protection:
    - Tightly sealed goggles

- 9.1 Information on basic physical and chemical properties
  - General Information
    - Appearance:
      - Form: Liquid
      - Colour: Dark red
      - Odour: Acrid
      - Odour threshold: Not determined.
    - pH-value: Not determined.
    - Change in condition
      - Melting point/Melting range: Undetermined.
Trade name: Cobalt tricarbonyl nitrosyl

### Boiling point/Boiling range
- **50 °C**

### Flash point
- Not applicable.

### Flammability (solid, gaseous)
- Not determined.

### Ignition temperature
- Not determined.

### Decomposition temperature
- Not determined.

### Self-igniting
- Not determined.

### Danger of explosion
- Not determined.

### Explosion limits
- **Lower:** Not determined.
- **Upper:** Not determined.

### Vapour pressure
- **No data hPa**

### Density at 20 °C
- **1.47 g/cm³**

### Relative density
- Not determined.

### Vapour density
- Not determined.

### Evaporation rate
- Not determined.

### Solubility in / Miscibility with water
- Not miscible or difficult to mix.

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

### Viscosity
- **Dynamic:** Not determined.
- **Kinematic:** Not determined.

### Solvent content
- **Organic solvents:** 0.0 %
- **VOC (EC):** 0.00 %

### 9.2 Other information
- No further relevant information available.

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### SECTION 10: Stability and reactivity

#### 10.1 Reactivity
- No further relevant information available.

#### 10.2 Chemical stability
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

#### 10.3 Possibility of hazardous reactions
- No dangerous reactions known.

#### 10.4 Conditions to avoid
- No further relevant information available.

#### 10.5 Incompatible materials
- No further relevant information available.

#### 10.6 Hazardous decomposition products
- No dangerous decomposition products known.

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### SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects
- **Acute toxicity**
  - Harmful if swallowed, in contact with skin or if inhaled.
- **Primary irritant effect:**
- **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
- **Serious eye damage/irritation** Based on available data, the classification criteria are not met.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.

(Contd. on page 6)
CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)
- Germ cell mutagenicity: Based on available data, the classification criteria are not met.
- Carcinogenicity: Suspected of causing cancer.
- Reproductive toxicity: Based on available data, the classification criteria are not met.
- STOT-single exposure: Based on available data, the classification criteria are not met.
- STOT-repeated exposure: Based on available data, the classification criteria are not met.
- Aspiration hazard: Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1 Toxicity
- Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential: No further relevant information available.

12.4 Mobility in soil: No further relevant information available.

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

12.6 Other adverse effects: No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
- Recommendation: Must not be disposed together with household garbage. Do not allow product to reach sewage system.

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

SECTION 14: Transport information

14.1 UN-Number
- ADR, IMDG, IATA: UN1992

14.2 UN proper shipping name
- ADR: 1992 FLAMMABLE LIQUID, TOXIC, N.O.S.
- IMDG: FLAMMABLE LIQUID, TOXIC, N.O.S.
- IATA: Flammable liquids, toxic, n.o.s.

14.3 Transport hazard class(es)
- ADR: 3 Flammable liquids.
Trade name: Cobalt tricarbonyl nitrosyl

- Label: 3+6.1
- IMDG:
  - Class: 3 Flammable liquids.
  - Label: 3/6.1
- IATA:
  - Class: 3 Flammable liquids.
  - Label: 3 (6.1)

14.4 Packing group
- ADR, IMDG, IATA: II

14.5 Environmental hazards:
- Marine pollutant: No

14.6 Special precautions for user
- Warning: Flammable liquids.
- EMS Number: F-E,S-D
- Stowage Category: B
- Stowage Code: SW2 Clear of living quarters.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code: Not applicable.

Transport/Additional information:
- ADR
  - Limited quantities (LQ): 1L
  - Excepted quantities (EQ): Code: E2
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 500 ml
- IMDG
  - Limited quantities (LQ): 1L
  - Excepted quantities (EQ): Code: E2
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 500 ml
- UN "Model Regulation": UN 1992 FLAMMABLE LIQUID, TOXIC, N.O.S., 3 (6.1), II

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
- Directive 2012/18/EU
- Named dangerous substances - ANNEX I Substance is not listed.
- Seveso category P5c FLAMMABLE LIQUIDS
- Qualifying quantity (tonnes) for the application of lower-tier requirements: 5,000 t
- Qualifying quantity (tonnes) for the application of upper-tier requirements: 50,000 t
42.0 · 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing MSDS: Technical Department.
· Contact: Technical Director
· Abbreviations and acronyms:
  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
  IATA: International Air Transport Association
  GHS: Globally Harmonised 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)
  VOC: Volatile Organic Compounds (USA, EU)
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative
  Flam. Liq. 2: Flammable liquids, Hazard Category 2
  Acute Tox. 4: Acute toxicity, Hazard Category 4
  Carc. 2: Carcinogenicity, Hazard Category 2