1 Identification

- **Product name**
  - Trade name: Ruthenium carbonyl, 99%
- **Item number**: 44-1850
- **CAS Number**: 15243-33-1
- **EC number**: 239-287-4
- **Details of the supplier of the safety data sheet**
  - **Manufacturer/Supplier**: Strem Chemicals, Inc.
    7 Mulliken Way
    NEWBURYPORT, MA 01950
    USA
    info@strem.com
- **Information department**: Technical Department
- **Emergency telephone number**:
  - EMERGENCY: CHEMTREC: + 1 (800) 424-9300
  - During normal opening times: +1 (978) 499-1600

2 Hazard(s) identification

- **Classification of the substance or mixture**
  The substance is not classified according to the Globally Harmonized System (GHS).

- **Label elements**
  - GHS label elements not applicable
  - Hazard pictograms not applicable
  - Signal word not applicable
  - Hazard statements not applicable

- **Precautionary statements**
  - **P262**: Do not get in eyes, on skin, or on clothing.
  - **P280**: Wear protective gloves/protective clothing/eye protection/face protection.
  - **P305+P351+P338**: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - **P304+P340**: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  - **P403+P233**: Store in a well-ventilated place. Keep container tightly closed.
  - **P501**: Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Classification system**:
  - NFPA ratings (scale 0 - 4)
    - Health = 0
    - Fire = 0
    - Reactivity = 0
  - HMIS-ratings (scale 0 - 4)
    - HEALTH: Health = 0
    - FIRE: Fire = 0
    - REACTIVITY: Reactivity = 0

- **Other hazards**
- **Results of PBT and vPvB assessment**
  - **PBT**: Not applicable.
Trade name: Ruthenium carbonyl, 99%

· vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Substances
· CAS No. Description
  15243-33-1 Ruthenium carbonyl, 99%
· Identification number(s)
· EC number: 239-287-4

4 First-aid measures

· Description of first aid measures
  · General information: No special measures required.
  · After inhalation: Supply fresh air; consult doctor in case of complaints.
  · After skin contact: Immediately rinse with water.
  · After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
  · After swallowing: If symptoms persist consult doctor.
  · Information for doctor:
    · Most important symptoms and effects, both acute and delayed No further relevant information available.
    · Indication of any immediate medical attention and special treatment needed
      No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  · Suitable extinguishing agents:
    CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  · Special hazards arising from the substance or mixture No further relevant information available.
  · Advice for firefighters
  · Protective equipment: No special measures required.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures Not required.
· Environmental precautions: No special measures required.
· Methods and material for containment and cleaning up:
  Dispose contaminated material as waste according to item 13.
· 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 No special measures required.
  · Information about protection against explosions and fires: No special measures required.
Trade name: Ruthenium carbonyl, 99%

- 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: Not required.
    - Further information about storage conditions: None.
    - Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
- Control parameters
- Components with limit values that require monitoring at the workplace: Not required.
- Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
- Personal protective equipment:
  - General protective and hygienic measures:
    The usual precautionary measures for handling chemicals should be followed.
  - Breathing equipment: Not required.
  - 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: Safety glasses

9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
  - Appearance:
    - Form: Crystalline
    - Color: Orange
    - Odor: Odorless
  - Odor threshold: Not determined.
  - pH-value: Not applicable.
- Change in condition
  - Melting point/Melting range: 150 dec °C (302 dec °F)
  - Boiling point/Boiling range: no data °C
## 10 Stability and reactivity

- **Reactivity**: No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
- **Possibility of hazardous reactions**: No dangerous reactions known.
- **Conditions to avoid**: No further relevant information available.
- **Incompatible materials**: No further relevant information available.
- **Hazardous decomposition products**: No dangerous decomposition products known.

## 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity**
- **Primary irritant effect**
  - **on the skin**: No irritant effect.
  - **on the eye**: No irritating effect.
- **Sensitization**: No sensitizing effects known.
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.
- Additional ecological information:
  - General notes: Not known to be hazardous to water.
  - 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: Disposal must be made according to official regulations.
- Uncleaned packaging:
  - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, ADN, IMDG, IATA: not regulated
- UN proper shipping name
  - DOT, ADN, IMDG, IATA: not regulated
- Transport hazard class(es)
  - DOT, ADN, IMDG, IATA: not regulated
  - Class: not regulated
- Packing group
  - DOT, IMDG, IATA: not regulated
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· Environmental hazards:
  · Marine pollutant: No

· Special precautions for user
  · Not applicable.

· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
  · Not applicable.

· UN "Model Regulation": not regulated

15 Regulatory information

· Safety, health and environmental regulations/legislation specific for the substance or mixture
  · Sara
    · Section 355 (extremely hazardous substances):
      Substance is not listed.
    · Section 313 (Specific toxic chemical listings):
      Substance is not listed.

· TSCA (Toxic Substances Control Act):
  · Substance is listed.

· Proposition 65
  · Chemicals known to cause cancer:
    Substance is not listed.
  · Chemicals known to cause reproductive toxicity for females:
    Substance is not listed.
  · Chemicals known to cause reproductive toxicity for males:
    Substance is not listed.
  · Chemicals known to cause developmental toxicity:
    Substance is not listed.

· Carcinogenic categories
  · EPA (Environmental Protection Agency)
    Substance is not listed.
  · TLV (Threshold Limit Value established by ACGIH)
    Substance is not listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)
  · Substance is not listed.

· GHS label elements not applicable
  · Hazard pictograms not applicable
  · Signal word not applicable
  · Hazard statements not applicable

· Precautionary statements
  P262 Do not get in eyes, on skin, or on clothing.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
### Chemical Safety Assessment

- **Chemical Safety Assessment:** A Chemical Safety Assessment has not been carried out.

### 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 SDS:** Technical Department.
- **Contact:** Technical Director
- **Date of preparation / last revision:** 07/30/2016 / -
- **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
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - VOC: Volatile Organic Compounds (USA, EU)
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - NIOSH: National Institute for Occupational Safety
  - OSHA: Occupational Safety & Health
  - TLV: Threshold Limit Value
  - PEL: Permissible Exposure Limit
  - REL: Recommended Exposure Limit

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**Trade name:** Ruthenium carbonyl, 99%

- **P403+P233** Store in a well-ventilated place. Keep container tightly closed.
- **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

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