# Safety Data Sheet

## according to OSHA HCS

### 1 Identification

- **Product name**
- **Trade name:** Tris(acetonitrile)pentamethylcyclopentadienylruthenium(II) hexafluorophosphate, min. 98%
- **Item number:** 44-7880
- **CAS Number:** 99604-67-8

### 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**

  ![GHS07](image)

  Skin Irrit. 2  H315  Causes skin irritation.
  Eye Irrit. 2A  H319  Causes serious eye irritation.
  STOT SE 3  H335  May cause respiratory irritation.

- **Label elements**

  - **GHS label elements**
    The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**

  ![GHS07](image)

- **Signal word** Warning

- **Hazard-determining components of labeling:**
  Tris(acetonitrile)pentamethylcyclopentadienylruthenium(II) hexafluorophosphate, min. 98%

- **Hazard statements**
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.

- **Precautionary statements**
  - **P231** Handle under inert gas.
  - **P235** Keep cool.
  - **P222** Do not allow contact with air.
  - **P305+P351+P338** If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

(Contd. on page 2)
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- Classification system:
  - NFPA ratings (scale 0 - 4)
    - Health = 1
    - Fire = 0
    - Reactivity = 0

- HMIS-ratings (scale 0 - 4)
  - Health = 1
  - Fire = 0
  - Reactivity = 0

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

3 Composition/information on ingredients

- Chemical characterization: Substances
- CAS No. Description
  99604-67-8 Tris(acetonitrile)pentamethylcyclopentadienylruthenium(II) hexafluorophosphate, min. 98%

4 First-aid measures

- Description of first aid measures
  - After inhalation: In case of unconsciousness place patient stably in side position for transportation.
  - After skin contact: Immediately wash with water and soap and rinse thoroughly.
  - After eye contact:
    - Rinse opened eye for several minutes under running water. If symptoms persist, 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.
  - 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**: Handle under inert gas.
- **Precautions for safe handling**: Open and handle receptacle with care.
- **Information about protection against explosions and fires**: No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage**:
  - Keep cool.
  - Store contents under inert gas.
- **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**:
  - Keep receptacle tightly sealed.
  - **Recommended storage temperature**: Store at temperatures not exceeding -18 °C.
  - **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**:
    - Keep away from foodstuffs, beverages and feed.
    - Immediately remove all soiled and contaminated clothing.
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the eyes and skin.
  - **Breathing equipment**: In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
  - **Protection of hands**:

  **Protective gloves**

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
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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 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
  - Appearance:
    Form: Powder
    Color: Light orange color
    Odor: Odorless
    Odor threshold: Not determined.
  - pH-value: Not applicable.

- Change in condition
  Melting point/Melting range: no data °C
  Boiling point/Boiling range: no data °C

- Flash point: Not applicable.

- Flammability (solid, gaseous): Not determined.

- Ignition temperature:
  Decomposition temperature: Not determined.
  Auto igniting: Not determined.

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

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

- Vapor pressure: no data hPa

- Density: Not determined.
  Relative density: Not determined.
  Vapor density: Not applicable.
  Evaporation rate: Not applicable.

- Solubility in / Miscibility with
  Water: Insoluble.

- Partition coefficient (n-octanol/water): Not determined.
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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**: Irritant to skin and mucous membranes.
      - **on the eye**: Irritating effect.
    - **Sensitization**: No sensitizing effects known.
  - **Additional toxicological information**: 
    - **Carcinogenic categories**
      - **IARC (International Agency for Research on Cancer)**
        - Substance is not listed.
      - **NTP (National Toxicology Program)**
        - Substance is not listed.
      - **OSHA-Ca (Occupational Safety & Health Administration)**
        - Substance is not listed.

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.
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13 Disposal considerations

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

- Uncleaned packagings:
  - 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

- Packing group
  - DOT, IMDG, IATA: not regulated

- 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 not listed.
### 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
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NTPA: 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
- Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
- Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
- STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3