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

- **Product identifier**
- **Trade name**: Ruthenizer 535-bisTBA
- **CAS Number**: 207347-46-4
- **Relevant identified uses of the substance or mixture and uses advised against**
- **Application of the substance / the preparation** Substance
- **Details of the supplier of the safety data sheet**
  - **Manufacturer/Supplier**: SOLARONIX SA
    Rue de l'Ouierette 129, CH-1170 Aubonne, Switzerland
    info@solaronix.com
    T +41 21 821 22 80
    www.solaronix.com
    F +41 21 821 22 89
    info@solaronix.com
- **Emergency telephone number**: Swiss Toxicological Information Center: +41 44 251 51 51

2 Hazards identification

- **Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**
  - GHS08 health hazard
    - Resp. Sens. 1  H334  May cause allergy or asthma symptoms or breathing difficulties if inhaled.
  - GHS07
    - Skin Sens. 1  H317  May cause an allergic skin reaction.
- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**
  - Xn; Sensitising
    - R42/43: May cause sensitisation by inhalation and skin contact.
- **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.
- **Hazard pictograms**
  - GHS08

- **Signal word** Danger
- **Hazard-determining components of labelling**: cis-diisothiocyanato-bis(2,2'-bipyridyl-4,4'-dicarboxylato) ruthenium(II) bis(tetrabutylammonium)
- **Hazard statements**
  - H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
  - H317 May cause an allergic skin reaction.

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Trade name: **Ruthenizer 535-bisTBA**

### Precautionary statements
- **P285** In case of inadequate ventilation wear respiratory protection.
- **P261** Avoid breathing dust/fume/gas/mist/vapours/spray.
- **P280** Wear protective gloves/protective clothing/eye protection/face protection.
- **P321** Specific treatment (see on this label).
- **P342+P311** If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
- **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

### 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**
  
  207347-46-4 cis-diisothiocyanato-bis(2,2'-bipyridyl-4,4'-dicarboxylato) ruthenium(II) bis(tetrabutylammonium)

### 4 First aid measures
- **Description of first aid measures**
  - **General information:**
    Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  - **After excessive inhalation:**
    In case of unconsciousness place patient in a stable laying down 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:**
    Do not induce vomiting; call for medical help immediately.
    If symptoms persist consult a 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 Firefighting measures
- **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
- **Special hazards arising from the substance or mixture**
  Formation of toxic gases is possible during heating or in case of fire.
  In case of fire, the following can be released:
  - Nitrogen oxides (NOx)
  - Carbon monoxide (CO)
Under certain fire conditions, traces of other toxic gases cannot be excluded.

- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

### 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
  - Mount respiratory protective device.
  - Avoid formation of dust.
  - Wear protective equipment. Keep unprotected persons away.
  - **Environmental precautions:** Do not allow to enter sewers/surface or ground water.
  - **Methods and material for containment and cleaning up:** Ensure adequate ventilation.
  - **Reference to other sections**
    - See Section 7 for information on safe handling.
    - See Section 8 for information on personal protective equipment.
    - See Section 13 for disposal information.
  
### 7 Handling and storage

- **Handling:**
  - **Precautions for safe handling**
    - Open and handle receptacle with care.
    - Ensure good ventilation/exhaustion at the workplace.
    - Prevent formation of dust.
  - **Information about fire - and explosion protection:**
    - Keep ignition sources away - Do not smoke.

- **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:** Keep container tightly sealed.
  - **Specific end use(s)** No further relevant information available.

### 8 Exposure controls/personal protection

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

- **Control parameters**
  - **Ingredients with limit values that require monitoring at the workplace:** Not required.
  - **Additional information:**
    - As a basis for the production of this document, the most current valid lists were used.

- **Exposure controls**
  - **Personal protective equipment:**
    - **General protective and hygienic measures:** Keep away from food, beverages and petfood. Immediately remove all soiled and contaminated clothing

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Wash hands before breaks and at the end of work. 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
  - Gloves material:
    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.

- **Eye protection:**
  Tightly sealed goggles

### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
  - **General Information**
    - **Appearance:**
      - Form: Powder
      - Colour: Black
    - Odour: Characteristic
    - Odour threshold: Not determined.
  - **pH-value:** Not applicable.
  - **Change in condition**
    - Melting point/Melting range: Undetermined.
    - Boiling point/Boiling range: Undetermined.
  - **Flash point:** Not applicable.
  - **Flammability (solid, gaseous):** Product is not flammable.
  - **Ignition temperature:** Not applicable.
  - **Decomposition temperature:** Not determined.
  - **Self-igniting:** Not determined.
  - **Danger of explosion:** Product does not present an explosion hazard.
  - **Explosion limits:**
    - Lower: Not determined.
    - Upper: Not determined.
  - **Vapour pressure:** Not applicable.
  - **Density:** Not determined.
  - **Relative density** Not determined.

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- Vapour density: Not applicable.
- Evaporation rate: Not applicable.

- Solubility in / Miscibility with water: Insoluble.

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

- Viscosity:
  - Dynamic: Not applicable.
  - Kinematic: Not applicable.

- Other information: No further relevant information available.

10 Stability and reactivity

- Reactivity
- Chemical stability
  - Thermal decomposition / conditions to be avoided:
    No decomposition if used according to specifications.
    To avoid thermal decomposition do not overheat.
- 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: Carbon monoxide and carbon dioxide

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.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
  - Behaviour in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.
- Additional ecological information:
- General notes:
  Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

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*Other adverse effects* No further relevant information available.

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

### 14 Transport information

- **Land transport ADR/RID (cross-border):**
  - ADR/RID class: -

- **Maritime transport IMDG:**
  - IMDG Class: -
  - Marine pollutant: No

- **Air transport ICAO-TI and IATA-DGR:**
  - ICAO/IATA Class: -

- **UN "Model Regulation":** -
- **Special precautions for user** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

### 15 Regulatory information

- **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.

**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)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
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)
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
CAS: Chemical Abstracts Service (division of the American Chemical Society)