1 Identification

· Product name
  · Trade name: Gold 1% on titanium dioxide extrudates (AUROlite™ Au/TiO2)
  · Item number: 79-0165
  · CAS Number:
    7440-57-5
    13463-67-7
  · EC number:
    236-675-5

· 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
  
  GHS08 Health hazard

  Carc. 2  H351  Suspected of causing cancer.

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

· Hazard pictograms
  
  GHS08

· Signal word Warning

· Hazard-determining components of labeling:
  Titanium oxide support for 79-0165 Au/TiO2 AUROlite

· Hazard statements
  H351 Suspected of causing cancer.

· Precautionary statements
  P235  Keep cool.
  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.
  P410  Protect from sunlight.
  P501  Dispose of contents/container in accordance with local/regional/national/international regulations.

(Contd. on page 2)
Trade name: Gold 1% on titanium dioxide extrudates (AUROlite™ Au/TiO2)

- Classification system:
  - NFPA ratings (scale 0 - 4)
    - Health = 2
    - 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
  13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite
- Identification number(s)
  - EC number: 236-675-5
- Dangerous components:
  - 7440-57-5 Gold 1.0%

### 4 First-aid measures

- Description of first aid measures
  - 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 precautions are necessary if used correctly.
  - Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
- Storage:
  - Keep cool.
  - Protect from sunlight.
- 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

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite</td>
<td>Long-term value: 15* mg/m³</td>
</tr>
</tbody>
</table>

*total dust

- 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.
    - Wash hands before breaks and at the end of work.
- 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: Solid
  · Color: Grey
  · Odor: Odorless
  · Odor threshold: Not determined.
  · pH-value at 20 °C (68 °F): ca.7

· Change in condition
  · Melting point/Melting range: 1830-1850 °C (3326-3362 °F)
  · Boiling point/Boiling range: 2500-3000 °C (4532-5432 °F)

· 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 at 20 °C (68 °F): 4.26 g/cm³ (35.55 lbs/gal)

· Bulk density at 20 °C (68 °F): ca.5 kg/m³
· Relative density
· Vapor density: Not applicable.
· Evaporation rate: Not applicable.
Safety Data Sheet
grouping to OSHA HCS

Trade name: Gold 1% on titanium dioxide extrudates (AUROlite™ Au/TiO2)

- Solubility in / Miscibility with Water: Insoluble.

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

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

- Solvent content:
  - Organic solvents: 0.0 %
  - VOC content: 0.0 g/l / 0.00 lb/gl

- Other information: No further relevant information available.

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:
  - LD/LC50 values that are relevant for classification:

| 13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite |
|-----------------|-----------------|
| Oral LD50 | >20000 mg/kg (rat) |
| Dermal LD50 | >10000 mg/kg (rabbit) |
| Inhalative LC50/4 h | >6.82 mg/l (rat) |

- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
- Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    - 13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite 2B
  - NTP (National Toxicology Program)
    - Substance is not listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    - Substance is not listed.
Safety Data Sheet
according to OSHA HCS

Printing date 07/31/2016
Reviewed on 07/31/2016

Trade name: Gold 1% on titanium dioxide extrudates (AUROlite™ Au/TiO2)

(Contd. of page 5)

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: 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: Class 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

(Contd. on page 7)
## 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:**
      - 13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite
    - **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)**
      - 13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite A4
    - **NIOSH-Ca (National Institute for Occupational Safety and Health)**
      - 13463-67-7 Titanium oxide support for 79-0165 Au/TiO2 AUROlite

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

#### Signal word
**Warning**

**Hazard-determining components of labeling:**
Titanium oxide support for 79-0165 Au/TiO2 AUROlite

**Hazard statements**
H351 Suspected of causing cancer.

**Precautionary statements**
- **P235** Keep cool.
- **P262** Do not get in eyes, on skin, or on clothing.
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Trade name: Gold 1% on titanium dioxide extrudates (AUROlite™ Au/TiO2)

P410  Protect from sunlight.
P501  Dispose of contents/container in accordance with local/regional/national/international regulations.

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: 07/31/2016/

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
ELINCS: European List of Notified 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)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
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
Carc. 2: Carcinogenicity, Hazard Category 2