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

Product identifier
Product name: Yttrium(III) oxide
Stock number: 11180
CAS Number: 1314-36-9
EC number: 215-233-5

Relevant identified uses of the substance or mixture and uses advised against.
Sector of Use: SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

2 Hazards identification

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

Eye Irrit. 2 H319 Causes serious eye irritation.

Classification according to Directive 67/548/ECC or Directive 1999/45/EC
Xi; Irritant
R36: Irritating to eyes.

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

Signal word: Warning

Hazard statements
H319 Causes serious eye irritation.

Precautionary statements
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P264 Wash thoroughly after handling.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.

Hazard description:
WHMIS classification
D2B - Toxic material causing other toxic effects

(Contd. on page 2)
Material Safety Data Sheet
According to OSHA and ANSI

Product name: Yttrium(III) oxide

3 Composition/information on ingredients

Chemical characterization: Substances
CAS# Description:
1314-36-9 Yttrium(III) oxide
Identification number(s):
EC number: 215-233-5

4 First aid measures

Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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

Extinguishing media
Suitable extinguishing agents
Product is not flammable. Use fire fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Metal oxide fume

Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation

Environmental precautions:
Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Pick up mechanically.

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
Handle under dry protective gas.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

Information about protection against explosions and fires: The product is not flammable.

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:
Store away from oxidizing agents.
Store away from air.
Further information about storage conditions:
Store under dry inert gas.
This product is air sensitive.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s):
No further relevant information available.

8 Exposure controls/personal protection:

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters:

Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>PEL</th>
<th>REL</th>
<th>TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1314-36-9 Yttrium(III) oxide (100.0%)</td>
<td>1 mg/m³ as Y</td>
<td>1 mg/m³ as Y</td>
<td>1 mg/m³ as Y</td>
</tr>
</tbody>
</table>

Additional information:
No data.

Exposure controls:

Personal protective equipment:

General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality.
Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties:

Information on basic physical and chemical properties:

General Information:
Appearance:
Form: Powder
Color: White
Odor: Odorless
Odor threshold: Not determined.

pH-value: Not applicable.

Change in condition:
Melting point/Melting range: 2410°C (4370 °F)
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined

Flammability (solid, gaseous): Not determined.
**Product name: Yttrium(III) oxide**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition temperature:</td>
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</tr>
<tr>
<td>Decomposition temperature:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Auto igniting:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Danger of explosion:</td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td>Explosion limits:</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>Not determined</td>
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<tr>
<td>Upper:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor pressure:</td>
<td>Not applicable</td>
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<tr>
<td>Density at 20°C (68 °F):</td>
<td>5.01 g/cm³ (41.808 lbs/gal)</td>
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<tr>
<td>Relative density:</td>
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<tr>
<td>Vapor density:</td>
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</tr>
<tr>
<td>Evaporation rate:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Solubility in / Miscibility with Water at 29°C (84 °F):</td>
<td>0.0018 g/l</td>
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<tr>
<td>Segregation coefficient (n-octanol/water):</td>
<td>Not determined</td>
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<tr>
<td>Viscosity:</td>
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<td>dynamic:</td>
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<tr>
<td>kinematic:</td>
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<tr>
<td>Other information:</td>
<td>No further relevant information available.</td>
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</table>

### 10 Stability and reactivity

**Reactivity**

**Chemical stability**

**Thermal decomposition / conditions to be avoided:**
Decomposition will not occur if used and stored according to specifications.

**Possibility of hazardous reactions**
No dangerous reactions known.

**Incompatible materials:**
Air, Oxidizing agents

**Hazardous decomposition products:** Metal oxide fume

### 11 Toxicological information

**Information on toxicological effects**

**Acute toxicity:**
- Primary irritant effect:
  - on the skin: May cause irritation
  - on the eye: Irritating effect.

**Sensitization:** No sensitizing effects known.

**Additional toxicological information:**
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute and/or other multiple dose toxicity data for components in this product.

### 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:**
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Do not allow material to be released to the environment without proper governmental permits.

**Results of PBT and vPvB assessment**

**PBT:** Not applicable.

**vPvB:** Not applicable.
Product name: Yttrium(III) oxide

Other adverse effects
No further relevant information available.

13 Disposal considerations
Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.

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

14 Transport information

<table>
<thead>
<tr>
<th>UN-Number</th>
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<tbody>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
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<table>
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<tr>
<th>Transport hazard class(es)</th>
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<table>
<thead>
<tr>
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<table>
<thead>
<tr>
<th>Environmental hazards:</th>
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<tbody>
<tr>
<td>Marine pollutant:</td>
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<tr>
<td>No</td>
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<table>
<thead>
<tr>
<th>Special precautions for user</th>
<th>Not applicable.</th>
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<table>
<thead>
<tr>
<th>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</th>
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<thead>
<tr>
<th>UN &quot;Model Regulation&quot;:</th>
<th>-</th>
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15 Regulatory information
Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations
Substances of very high concern (SVHC) according to REACH, Article 57
Substance is not listed.
REACH - Pre-registered substances Substance is listed.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.

Contact:
Zachariah C. Holt
Global EHS Manager

Abbreviations and acronyms:
RID: Règlement International concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
GHS: Globally Harmonized 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)
HHIPS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)