

Ilmenite Flour ALPHA CHEMICALS PTY LTD

Chemwatch Hazard Alert Code: 3

Issue Date: 08/11/2020 Print Date: 12/05/2021 S.GHS.AUS.EN

Chemwatch: 24-8093 Version No: 4.1.5.1

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

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

| Product Identifier | |
|-------------------------------|----------------|
| Product name | Ilmenite Flour |
| Chemical Name | Not Applicable |
| Synonyms | FOUNDRY SAND |
| Chemical formula | Not Applicable |
| Other means of identification | Not Available |

Relevant identified uses of the substance or mixture and uses advised against

| Relevant identified uses | May be used in cast metal applications. |
|--------------------------|---|

Details of the supplier of the safety data sheet

| Registered company name | ALPHA CHEMICALS PTY LTD |
|-------------------------|---|
| Address | 4 ALLEN PLACE WETHERILL PARK NSW 2099 Australia |
| Telephone | 61 (0)2 9982 4622 |
| Fax | Not Available |
| Website | ~ |
| Email | shane@alphachem.com.au |

Emergency telephone number

| Association / Organisation | ALPHA CHEMICALS PTY LTD |
|-----------------------------------|-------------------------|
| Emergency telephone numbers | 61 (0)418 237 771 |
| Other emergency telephone numbers | Not Available |

SECTION 2 Hazards identification

Classification of the substance or mixture

HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

ChemWatch Hazard Ratings

| | Min | Max i | |
|--------------|-----|-------|-------------------------|
| Flammability | 0 | | |
| Toxicity | 1 | | 0 = Minimum |
| Body Contact | 0 | | 1 = Low |
| Reactivity | 0 | | 2 = Moderate |
| Chronic | 3 | | 3 = High 4 = Extreme |

| Poisons Schedule | Not Applicable |
|--------------------|---|
| Classification [1] | Skin Sensitizer Category 1, Carcinogenicity Category 1A |
| Legend: | 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI |

Label elements

Hazard pictogram(s)





Signal word Danger

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Hazard statement(s)

| H317 | May cause an allergic skin reaction. |
|------|--------------------------------------|
| H350 | May cause cancer. |

Precautionary statement(s) Prevention

| P201 | Obtain special instructions before use. | |
|------|---|--|
| P280 | Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. | |
| P261 | P261 Avoid breathing dust/fumes. | |
| P272 | Contaminated work clothing should not be allowed out of the workplace. | |

Precautionary statement(s) Response

| P308+P313 | IF exposed or concerned: Get medical advice/ attention. |
|-----------|--|
| P302+P352 | IF ON SKIN: Wash with plenty of water and soap. |
| P333+P313 | If skin irritation or rash occurs: Get medical advice/attention. |
| P362+P364 | Take off contaminated clothing and wash it before reuse. |

Precautionary statement(s) Storage

P405 Store locked up.

Precautionary statement(s) Disposal

P501 Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

| CAS No | %[weight] | Name |
|-------------|---|-----------------------------|
| 12789-64-9 | >75 | ilmenite |
| 103170-28-1 | <15 | leucoxene |
| 68187-09-7. | <6 | chromite |
| 14808-60-7 | <4 | silica crystalline - quartz |
| 7440-61-1 | <0.001 | uranium depleted |
| 7440-29-1 | <0.005 | thorium |
| Legend: | 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L * EU IOELVs available | |

SECTION 4 First aid measures

Description of first aid measures

| Contact | |
|----------|--|
| Contact | |
| halation | |
| ngestion | |

Indication of any immediate medical attention and special treatment needed

SECTION 5 Firefighting measures

Extinguishing media

Special hazards arising from the substrate or mixture

Fire Incompatibility

Advice for firefighters

| Advice for file lighters | |
|--------------------------|----------------|
| Fire Fighting | |
| Fire/Explosion Hazard | |
| HAZCHEM | Not Applicable |

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

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Environmental precautions

See section 12

Methods and material for containment and cleaning up

| Minor Spills |
|--------------|
| Major Spills |

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling
Other information

Conditions for safe storage, including any incompatibilities

Suitable container Storage incompatibility

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|------------------------------|-----------------------------|--|------------|---------------|---------------|---------------|
| Australia Exposure Standards | chromite | Chromium (III) compounds (as Cr) | 0.5 mg/m3 | Not Available | Not Available | Not Available |
| Australia Exposure Standards | silica crystalline - quartz | Silica - Crystalline: Quartz (respirable dust) | 0.05 mg/m3 | Not Available | Not Available | Not Available |

Emergency Limits

| Ingredient | TEEL-1 | TEEL-2 | TEEL-3 |
|-----------------------------|-------------|-----------|-------------|
| ilmenite | 30 mg/m3 | 330 mg/m3 | 2,000 mg/m3 |
| chromite | 3.2 mg/m3 | 36 mg/m3 | 220 mg/m3 |
| silica crystalline - quartz | 0.075 mg/m3 | 33 mg/m3 | 200 mg/m3 |
| uranium depleted | 0.6 mg/m3 | 5 mg/m3 | 30 mg/m3 |
| thorium | 30 mg/m3 | 330 mg/m3 | 2,000 mg/m3 |

| Ingredient | Original IDLH | Revised IDLH |
|-----------------------------|---------------------|---------------|
| ilmenite | Not Available | Not Available |
| leucoxene | Not Available | Not Available |
| chromite | 25 mg/m3 | Not Available |
| silica crystalline - quartz | 25 mg/m3 / 50 mg/m3 | Not Available |
| uranium depleted | 10 mg/m3 | Not Available |
| thorium | Not Available | Not Available |

Occupational Exposure Banding

| Ingredient | Occupational Exposure Band Rating | Occupational Exposure Band Limit |
|------------------|--|---|
| uranium depleted | E | ≤ 0.01 mg/m³ |
| Notes: | Occupational exposure banding is a process of assigning chemicals into s adverse health outcomes associated with exposure. The output of this programs of exposure concentrations that are expected to protect worker hear | cess is an occupational exposure band (OEB), which corresponds to a |

Exposure controls

| Appropriate engineering controls | |
|----------------------------------|----------------------------|
| Personal protection | |
| Eye and face protection | |
| Skin protection | See Hand protection below |
| Hands/feet protection | |
| Body protection | See Other protection below |
| Other protection | |

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Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

| Required Minimum Protection Factor | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|------------------------------------|----------------------|----------------------|------------------------|
| up to 10 x ES | P1 Air-line* | - | PAPR-P1 |
| up to 50 x ES | Air-line** | P2 | PAPR-P2 |
| up to 100 x ES | - | P3 | - |
| | | Air-line* | - |
| 100+ x ES | - | Air-line** | PAPR-P3 |

^{* -} Negative pressure demand ** - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

| morniation on basic physical a | | | |
|--|----------------|---|----------------|
| Appearance Black brown to black sands with no odour; insoluble in water. | | | |
| Physical state | Divided Solid | Relative density (Water = 1) | 4-4.30 |
| Odour | Not Available | Partition coefficient n-octanol / water | Not Available |
| Odour threshold | Not Available | Auto-ignition temperature (°C) | Not Applicable |
| pH (as supplied) | Not Applicable | Decomposition temperature | Not Available |
| Melting point / freezing point (°C) | 3370 | Viscosity (cSt) | Not Applicable |
| Initial boiling point and boiling range (°C) | Not Available | Molecular weight (g/mol) | Not Applicable |
| Flash point (°C) | Not Applicable | Taste | Not Available |
| Evaporation rate | Not Available | Explosive properties | Not Available |
| Flammability | Not Applicable | Oxidising properties | Not Available |
| Upper Explosive Limit (%) | Not Applicable | Surface Tension (dyn/cm or mN/m) | Not Applicable |
| Lower Explosive Limit (%) | Not Applicable | Volatile Component (%vol) | Not Available |
| Vapour pressure (kPa) | Not Applicable | Gas group | Not Available |
| Solubility in water | Immiscible | pH as a solution (1%) | Not Applicable |
| Vapour density (Air = 1) | Not Available | VOC g/L | Not Available |

SECTION 10 Stability and reactivity

| Reactivity | See section 7 |
|------------------------------------|---------------|
| Chemical stability | |
| Possibility of hazardous reactions | See section 7 |
| Conditions to avoid | See section 7 |
| Incompatible materials | See section 7 |
| Hazardous decomposition products | See section 5 |

SECTION 11 Toxicological information

| Information on | toxicological | effects |
|----------------|---------------|---------|
|----------------|---------------|---------|

| Inhaled | | |
|----------------------------|-------------------------|---------------------------|
| Ingestion | | |
| Skin Contact | | |
| Eye | | |
| Chronic | | |
| | | |
| | | |
| Umanita Flanc | TOXICITY | IRRITATION |
| Ilmenite Flour | TOXICITY Not Available | IRRITATION Not Available |
| Ilmenite Flour | Not Available | Not Available |
| Ilmenite Flour ilmenite | | |

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| | TOXICITY | IRRITATION |
|-----------------------------|--|---|
| leucoxene | Not Available | Not Available |
| | TOXICITY | IRRITATION |
| chromite | Not Available | Not Available |
| | TOXICITY | IRRITATION |
| silica crystalline - quartz | Oral(Rat) LD50; 500 mg/kg ^[2] | Not Available |
| | TOXICITY | IRRITATION |
| uranium depleted | Oral(Human) LD50; 1.63 mg/kg ^[2] | Not Available |
| | TOXICITY | IRRITATION |
| thorium | Not Available | Not Available |
| Legend: | Value obtained from Europe ECHA Registered Substance specified data extracted from RTECS - Register of Toxic Effe | s - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise ct of chemical Substances |

The following information refers to contact allergens as a group and may not be specific to this product.

CHROMITE

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

On skin and inhalation exposure, chromium and its compounds (except hexavalent) can be a potent sensitiser, as particulates. Studies show that they have a complex toxicity mechanism with hexavalent chromium associated with an increased risk of lung damage and respiratory cancers (primarily bronchogenic and nose cancers). However, there is no evidence that elemental, divalent, or trivalent chromium compounds causes cancer or genetic toxicity.

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

Substance has been investigated as a tumorigen and mutagen.

SILICA CRYSTALLINE -

WARNING: For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS

The International Agency for Research on Cancer (IARC) has classified occupational exposures to respirable (<5 um) crystalline silica as being carcinogenic to humans. This classification is based on what IARC considered sufficient evidence from epidemiological studies of humans for the carcinogenicity of inhaled silica in the forms of quartz and cristobalite. Crystalline silica is also known to cause silicosis, a non-cancerous lung disease.

Intermittent exposure produces; focal fibrosis, (pneumoconiosis), cough, dyspnoea, liver tumours.

* Millions of particles per cubic foot (based on impinger samples counted by light field techniques).

NOTE: the physical nature of quartz in the product determines whether it is likely to present a chronic health problem. To be a hazard the material must enter the breathing zone as respirable particles.

THORIUM

Thorium and its compounds are mainly alpha particle emitters although beta and gamma

radiation is also encountered

The radiological danger is considerably more serious than the chemical danger in view of the long time that all thorium compounds remain in the organs where they are deposited (mainly in bones, lungs, lymphatic glands etc.) leading to long-term alpha-irradiation of the tissues

WARNING: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.

ILMENITE & LEUCOXENE & CHROMITE & THORIUM

No significant acute toxicological data identified in literature search.

| Acute Toxicity | × | Carcinogenicity | ✓ |
|-----------------------------------|---|--------------------------|---|
| Skin Irritation/Corrosion | × | Reproductivity | × |
| Serious Eye Damage/Irritation | × | STOT - Single Exposure | × |
| Respiratory or Skin sensitisation | ✓ | STOT - Repeated Exposure | × |
| Mutagenicity | × | Aspiration Hazard | × |

Legend:

X - Data either not available or does not fill the criteria for classification

- Data available to make classification

SECTION 12 Ecological information

Toxicity

| · · · · · · · · · · | | | | | |
|---------------------|------------------|--------------------|---------------|------------------|------------------|
| | Endpoint | Test Duration (hr) | Species | Value | Source |
| Ilmenite Flour | Not Available | Not Available | Not Available | Not Available | Not Available |
| | Endpoint | Test Duration (hr) | Species | Value | Source |
| ilmenite | Not Available | Not Available | Not Available | Not Available | Not Available |

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| | Endpoint | Test Duration (hr) | Species | Value | Source |
|-----------------------------|------------------|--------------------|---|------------------|------------------|
| leucoxene | Not Available | Not Available | Not Available | Not Available | Not Available |
| | Endpoint | Test Duration (hr) | Species | Value | Source |
| chromite | Not Available | Not Available | Not Available | Not Available | Not Available |
| | Endpoint | Test Duration (hr) | Species | Value | Source |
| silica crystalline - quartz | Not Available | Not Available | Not Available | Not Available | Not Available |
| | Endpoint | Test Duration (hr) | Species | Value | Source |
| uranium depleted | NOEC(ECx) | 504h | Algae or other aquatic plants | 0.765-2mg/l | 4 |
| - | LC50 | 96h | Fish | 6.2mg/l | 4 |
| | Endpoint | Test Duration (hr) | Species | Value | Source |
| thorium | Not Available | Not Available | Not Available | Not Available | Not Available |
| Legend: | | , | IA Registered Substances - Ecotoxicological Informat IS EPA, Ecotox database - Aquatic Toxicity Data 5. Ec | , , | |

Persistence and degradability

| Ingredient | Persistence: Water/Soil | Persistence: Air |
|------------|---------------------------------------|---------------------------------------|
| | No Data available for all ingredients | No Data available for all ingredients |

Bioaccumulative potential

| Ingredient | Bioaccumulation |
|------------|---------------------------------------|
| | No Data available for all ingredients |

Mobility in soil

| Ingredient | Mobility |
|------------|---------------------------------------|
| | No Data available for all ingredients |

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal

SECTION 14 Transport information

Labels Required

| Marine Pollutant | NO |
|------------------|----------------|
| HAZCHEM | Not Applicable |

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

| • | |
|-----------------------------|---------------|
| Product name | Group |
| ilmenite | Not Available |
| leucoxene | Not Available |
| chromite | Not Available |
| silica crystalline - quartz | Not Available |
| uranium depleted | Not Available |
| thorium | Not Available |

Transport in bulk in accordance with the ICG Code

| Product name | Ship Typ |
|--------------|----------|

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| Product name | Ship Type |
|-----------------------------|---------------|
| ilmenite | Not Available |
| leucoxene | Not Available |
| chromite | Not Available |
| silica crystalline - quartz | Not Available |
| uranium depleted | Not Available |
| thorium | Not Available |

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

ilmenite is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2

Australian Inventory of Industrial Chemicals (AIIC)

leucoxene is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

chromite is found on the following regulatory lists

Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4 $\,$

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule $\bf 6$

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

silica crystalline - quartz is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

uranium depleted is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

thorium is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

National Inventory Status

| National Inventory | Status |
|--|--|
| Australia - AIIC / Australia Non-Industrial Use | Yes |
| Canada - DSL | No (leucoxene) |
| Canada - NDSL | No (ilmenite; leucoxene; chromite; silica crystalline - quartz; uranium depleted; thorium) |
| China - IECSC | No (leucoxene; uranium depleted; thorium) |
| Europe - EINEC / ELINCS / NLP | No (leucoxene) |
| Japan - ENCS | No (ilmenite; leucoxene; chromite; uranium depleted; thorium) |
| Korea - KECI | No (leucoxene; thorium) |
| New Zealand - NZIoC | No (ilmenite) |
| Philippines - PICCS | No (leucoxene) |
| USA - TSCA | No (leucoxene) |
| Taiwan - TCSI | Yes |
| Mexico - INSQ | No (ilmenite; leucoxene) |
| Vietnam - NCI | No (leucoxene) |
| Russia - FBEPH | No (leucoxene; thorium) |
| Legend: | Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets) |

SECTION 16 Other information

| Revision Date | 08/11/2020 |
|---------------|------------|
| Initial Date | 08/03/2013 |
| | |

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SDS Version Summary

| Version | Date of Update | Sections Updated |
|---------|----------------|--|
| 3.1.1.1 | 01/11/2019 | One-off system update. NOTE: This may or may not change the GHS classification |
| 4.1.1.1 | 08/11/2020 | Advice to Doctor |
| 4.1.2.1 | 26/04/2021 | Regulation Change |
| 4.1.3.1 | 03/05/2021 | Regulation Change |
| 4.1.4.1 | 06/05/2021 | Regulation Change |
| 4.1.5.1 | 10/05/2021 | Regulation Change |

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC-TWA: Permissible Concentration-Time Weighted Average

PC-STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit。

IDLH: Immediately Dangerous to Life or Health Concentrations

ES: Exposure Standard

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value

LOD: Limit Of Detection

OTV: Odour Threshold Value

BCF: BioConcentration Factors

BEI: Biological Exposure Index

AIIC: Australian Inventory of Industrial Chemicals

DSL: Domestic Substances List

NDSL: Non-Domestic Substances List

IECSC: Inventory of Existing Chemical Substance in China

EINECS: European INventory of Existing Commercial chemical Substances

ELINCS: European List of Notified Chemical Substances

NLP: No-Longer Polymers

ENCS: Existing and New Chemical Substances Inventory

KECI: Korea Existing Chemicals Inventory NZIoC: New Zealand Inventory of Chemicals

PICCS: Philippine Inventory of Chemicals and Chemical Substances

TSCA: Toxic Substances Control Act

TCSI: Taiwan Chemical Substance Inventory

INSQ: Inventario Nacional de Sustancias Químicas

NCI: National Chemical Inventory

FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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