



# Ammonium Cerium Sulphate Dihydrate

## ALPHA CHEMICALS PTY LTD

Chemwatch Hazard Alert Code: 2

Chemwatch: 64-5792  
Version No: 3.1.1.1  
Safety Data Sheet according to WHS and ADG requirements

Issue Date: 01/11/2019  
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S.GHS.AUS.EN

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

#### Product Identifier

|                               |                                    |
|-------------------------------|------------------------------------|
| Product name                  | Ammonium Cerium Sulphate Dihydrate |
| Chemical Name                 | cerium(IV) ammonium sulfate        |
| Synonyms                      | Product Code: 21232                |
| Other means of identification | Not Available                      |

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

|                          |  |
|--------------------------|--|
| Relevant identified uses | General chemical reagent.<br>Use according to manufacturer's directions. |
|--------------------------|--|

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

|                    |   |
|--------------------|---|
| Poisons Schedule   | Not Applicable  |
| Classification [1] | Oxidizing Solid Category 3  |
| 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         | Warning |

## Ammonium Cerium Sulphate Dihydrate

### Hazard statement(s)

|             |                               |
|-------------|-------------------------------|
| <b>H272</b> | May intensify fire; oxidiser. |
|-------------|-------------------------------|

### Precautionary statement(s) Prevention

|             |  |
|-------------|--|
| <b>P210</b> | Keep away from heat/sparks/open flames/hot surfaces. - No smoking.         |
| <b>P221</b> | Take any precaution to avoid mixing with combustibles/organic material.    |
| <b>P220</b> | Keep/Store away from clothing/organic material/combustible materials.      |
| <b>P280</b> | Wear protective gloves/protective clothing/eye protection/face protection. |

### Precautionary statement(s) Response

|                  |  |
|------------------|--|
| <b>P370+P378</b> | In case of fire: Use water spray/fog for extinction. |
|------------------|--|

### Precautionary statement(s) Storage

Not Applicable

### Precautionary statement(s) Disposal

|             |  |
|-------------|--|
| <b>P501</b> | 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                                       |
|---------------|-----------|--|
| 13840-04-5    | 60-100    | <u>cerium(IV) ammonium sulfate</u>         |
| Not Available | balance   | Ingredients determined not to be hazardous |

## SECTION 4 First aid measures

### Description of first aid measures

|                     |  |
|---------------------|--|
| <b>Eye Contact</b>  | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with fresh running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Seek medical attention without delay; if pain persists or recurs seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>  |
| <b>Skin Contact</b> | <p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>  |
| <b>Inhalation</b>   | <ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>  |
| <b>Ingestion</b>    | <ul style="list-style-type: none"> <li>▶ <b>If swallowed do NOT induce vomiting.</b></li> <li>▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>▶ Observe the patient carefully.</li> <li>▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</li> <li>▶ Seek medical advice.</li> </ul> |

### Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5 Firefighting measures

### Extinguishing media

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

### Special hazards arising from the substrate or mixture

|                             |             |
|-----------------------------|-------------|
| <b>Fire Incompatibility</b> | None known. |
|-----------------------------|-------------|

### Advice for firefighters

|                      |   |
|----------------------|---|
| <b>Fire Fighting</b> | <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> <li>▶ <b>DO NOT</b> approach containers suspected to be hot.</li> <li>▶ Cool fire exposed containers with water spray from a protected location.</li> <li>▶ If safe to do so, remove containers from path of fire.</li> <li>▶ Equipment should be thoroughly decontaminated after use.</li> </ul> |
|----------------------|---|

## Ammonium Cerium Sulphate Dihydrate

|                              |  |
|------------------------------|--|
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>▶ Will not burn but increases intensity of fire.</li> <li>▶ Heating may cause expansion or decomposition leading to violent rupture of containers.</li> <li>▶ Heat affected containers remain hazardous.</li> <li>▶ Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition.</li> <li>▶ May emit irritating, poisonous or corrosive fumes.</li> </ul> <p>Decomposition may produce toxic fumes of:<br/>nitrogen oxides (NOx)<br/>sulfur oxides (SOx)<br/>May emit poisonous fumes.<br/>May emit corrosive fumes.</p> |
| <b>HAZCHEM</b>               | Not Applicable   |

**SECTION 6 Accidental release measures****Personal precautions, protective equipment and emergency procedures**

See section 8

**Environmental precautions**

See section 12

**Methods and material for containment and cleaning up**

|                     |  |
|---------------------|--|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ No smoking, naked lights, ignition sources.</li> <li>▶ Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.</li> <li>▶ Avoid breathing dust or vapours and all contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> <li>▶ Contain and absorb spill with dry sand, earth, inert material or vermiculite.</li> <li>▶ <b>DO NOT use sawdust as fire may result.</b></li> <li>▶ Scoop up solid residues and seal in labelled drums for disposal.</li> </ul> |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ May be violently or explosively reactive.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Consider evacuation (or protect in place).</li> <li>▶ No smoking, flames or ignition sources.</li> <li>▶ Increase ventilation.</li> </ul>  |

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

**SECTION 7 Handling and storage****Precautions for safe handling**

|                          |   |
|--------------------------|---|
| <b>Safe handling</b>     | <p>For oxidisers, including peroxides.</p> <ul style="list-style-type: none"> <li>-Avoid personal contact and inhalation of dust, mist or vapours.</li> <li>-Provide adequate ventilation.</li> <li>-Always wear protective equipment and wash off any spillage from clothing.</li> <li>-Keep material away from light, heat, flammables or combustibles.</li> <li>-Keep cool, dry and away from incompatible materials.</li> <li>-Avoid physical damage to containers.</li> <li>-<b>DO NOT repack or return unused portions to original containers.</b></li> </ul>   |
| <b>Other information</b> | <ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry area protected from environmental extremes.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul> <p>For major quantities:</p> <ul style="list-style-type: none"> <li>▶ Consider storage in banded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams).</li> <li>▶ Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.</li> </ul> |

**Conditions for safe storage, including any incompatibilities**

|                                |  |
|--------------------------------|--|
| <b>Suitable container</b>      | <ul style="list-style-type: none"> <li>▶ Glass container is suitable for laboratory quantities</li> <li>▶ Polyethylene or polypropylene container.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul>  |
| <b>Storage incompatibility</b> | <ul style="list-style-type: none"> <li>▶ Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.</li> <li>▶ Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.</li> <li>▶ Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous</li> <li>▶ Avoid storage with reducing agents.</li> </ul> |

**SECTION 8 Exposure controls / personal protection****Control parameters**

## Ammonium Cerium Sulphate Dihydrate

## Occupational Exposure Limits (OEL)

## INGREDIENT DATA

Not Available


## Emergency Limits

| Ingredient                         | Material name | TEEL-1        | TEEL-2        | TEEL-3        |
|------------------------------------|---------------|---------------|---------------|---------------|
| Ammonium Cerium Sulphate Dihydrate | Not Available | Not Available | Not Available | Not Available |
| Ingredient                         | Original IDLH | Revised IDLH  |               |               |
| cerium(IV) ammonium sulfate        | Not Available | Not Available |               |               |

## Occupational Exposure Banding

| Ingredient                  | Occupational Exposure Band Rating   | Occupational Exposure Band Limit |
|-----------------------------|---|----------------------------------|
| cerium(IV) ammonium sulfate | E   | ≤ 0.01 mg/m <sup>3</sup>         |
| <b>Notes:</b>               | <i>Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.</i> |                                  |

## Exposure controls

|   |   |
|---|---|
| <b>Appropriate engineering controls</b> | <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <ul style="list-style-type: none"> <li>Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.</li> </ul>  |
| <b>Personal protection</b>              |   |
| <b>Eye and face protection</b>          | <ul style="list-style-type: none"> <li>Safety glasses with side shields.</li> <li>Chemical goggles.</li> <li>Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly.</li> </ul>  |
| <b>Skin protection</b>                  | See Hand protection below   |
| <b>Hands/feet protection</b>            | <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p> <p>Suitability and durability of glove type is dependent on usage.</p> <p>Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.</p> <ul style="list-style-type: none"> <li>polychloroprene.</li> <li>nitrile rubber.</li> <li>butyl rubber.</li> <li>fluorocautchouc.</li> <li>polyvinyl chloride.</li> </ul> <p>Gloves should be examined for wear and/ or degradation constantly.</p> |
| <b>Body protection</b>                  | See Other protection below  |
| <b>Other protection</b>                 | <ul style="list-style-type: none"> <li>Overalls.</li> <li>P.V.C apron.</li> <li>Barrier cream.</li> <li>Skin cleansing cream.</li> <li>Eye wash unit.</li> </ul>  |

## Respiratory protection

Particulate. (AS/NZS 1716 &amp; 1715, EN 143:2000 &amp; 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<br>Air-line*      | -<br>-               | PAPR-P1<br>-           |
| up to 50 x ES                      | Air-line**           | P2                   | PAPR-P2                |
| up to 100 x ES                     | -                    | P3                   | -                      |

Continued...

## Ammonium Cerium Sulphate Dihydrate

|           |   |            |         |
|-----------|---|------------|---------|
|           |   | 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(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- ▶ The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- ▶ Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- ▶ Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- ▶ Use approved positive flow mask if significant quantities of dust becomes airborne.
- ▶ Try to avoid creating dust conditions.

## SECTION 9 Physical and chemical properties

## Information on basic physical and chemical properties

|   |                                   |  |                |
|---|-----------------------------------|--|----------------|
| <b>Appearance</b>                                   | Yellow solid; soluble with water. |  |                |
| <b>Physical state</b>                               | Solid                             | <b>Relative density (Water = 1)</b>            | Not Available  |
| <b>Odour</b>  | Not Available                     | <b>Partition coefficient n-octanol / water</b> | Not Available  |
| <b>Odour threshold</b>                              | Not Available                     | <b>Auto-ignition temperature (°C)</b>          | Not Available  |
| <b>pH (as supplied)</b>                             | Not Applicable                    | <b>Decomposition temperature</b>               | Not Available  |
| <b>Melting point / freezing point (°C)</b>          | 130                               | <b>Viscosity (cSt)</b>                         | Not Applicable |
| <b>Initial boiling point and boiling range (°C)</b> | Not Available                     | <b>Molecular weight (g/mol)</b>                | Not Applicable |
| <b>Flash point (°C)</b>                             | Not Applicable                    | <b>Taste</b>                                   | Not Available  |
| <b>Evaporation rate</b>                             | Not Available                     | <b>Explosive properties</b>                    | Not Available  |
| <b>Flammability</b>                                 | Not Applicable                    | <b>Oxidising properties</b>                    | Not Available  |
| <b>Upper Explosive Limit (%)</b>                    | Not Available                     | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Applicable |
| <b>Lower Explosive Limit (%)</b>                    | Not Available                     | <b>Volatile Component (%vol)</b>               | Not Available  |
| <b>Vapour pressure (kPa)</b>                        | Not Available                     | <b>Gas group</b>                               | Not Available  |
| <b>Solubility in water</b>                          | Miscible                          | <b>pH as a solution (1%)</b>                   | 1-2 (10%)      |
| <b>Vapour density (Air = 1)</b>                     | Not Available                     | <b>VOC g/L</b>                                 | Not Available  |

## SECTION 10 Stability and reactivity

|   |  |
|---|--|
| <b>Reactivity</b>                         | See section 7  |
| <b>Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul> |
| <b>Possibility of hazardous reactions</b> | See section 7  |
| <b>Conditions to avoid</b>                | See section 7  |
| <b>Incompatible materials</b>             | See section 7  |
| <b>Hazardous decomposition products</b>   | See section 5  |

## SECTION 11 Toxicological information

## Information on toxicological effects

|                  |  |
|------------------|--|
| <b>Inhaled</b>   | <p>Levels above 10 micrograms per cubic metre of suspended inorganic sulfates in the air may cause an excess risk of asthmatic attacks in susceptible people.</p> <p>Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.</p> <p>If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p> <p>Exposure to vapours of some rare earth salts can cause sensitivity to heat, itching, and increased sensitivity of smell and taste. Other effects include inflamed airways and lung, emphysema, regional narrowing of terminal airways and cell changes.</p> <p>There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.</p> |
| <b>Ingestion</b> | <p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>Sulfates are not well absorbed orally, but can cause diarrhoea.</p> <p>Lanthanide poisoning causes immediate defaecation, writhing, inco-ordination, laboured breathing, and inactivity. Respiratory and heart failure</p>   |

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|   |   |                   |
|---|---|-------------------|
|   | may follow causing death.<br>Large doses of ammonia or injected ammonium salts may produce diarrhoea and may be sufficiently absorbed to produce increased production of urine and systemic poisoning. Symptoms include weakening of facial muscle, tremor, anxiety, reduced muscle and limb control.   |                   |
| <b>Skin Contact</b>                       | Open cuts, abraded or irritated skin should not be exposed to this material<br>There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.  |                   |
| <b>Eye</b>                                | There is some evidence to suggest that this material can cause eye irritation and damage in some persons.   |                   |
| <b>Chronic</b>                            | Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There is some evidence that inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.<br>Cerium is one of the rare earth metals - light type (cerium family). Rare earth metals have not been shown to have toxic effects, but dust inhalation can still cause scarring of the lungs.<br>Levels above 10 micrograms per cubic metre of suspended inorganic sulfates in the air may cause an excess risk of asthmatic attacks in susceptible people. |                   |
| <b>Ammonium Cerium Sulphate Dihydrate</b> | <b>TOXICITY</b>   | <b>IRRITATION</b> |
|   | Not Available   | Not Available     |
| <b>cerium(IV) ammonium sulfate</b>        | <b>TOXICITY</b>   | <b>IRRITATION</b> |
|   | Not Available   | Not Available     |
| <b>Legend:</b>                            | 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances   |                   |

|   |  |
|---|--|
| <b>Ammonium Cerium Sulphate Dihydrate &amp; CERIUM(IV) AMMONIUM SULFATE</b> | <p>No significant acute toxicological data identified in literature search.</p> <p>Lanthanide poisoning causes immediate defaecation, writhing, inco-ordination, laboured breathing, and inactivity. Respiratory and heart failure may follow causing death.</p> <p>For typical lanthanides:<br/>Symptoms of toxicity from rare earth elements include writhing, inco-ordination, laboured breathing, and sedation. They show low toxicity via swallowing. However, if given through the peritoneal cavity, they may be severely toxic, and injected through the skin, they are moderately toxic. They cause granulomas after exposure.</p> <p>Chronic inhalation toxicity: Chronically exposed humans have been shown to have lanthanide particles accumulate in the airway, with enlargement of lymph nodes of the bronchi being observed.</p> <p>Developmental/reproductive toxicity: One animal study did not show lanthanum carbonate to affect fertility or harm the foetus.</p> <p>Mutation-causing potential: Animal studies showed cerium oxide to be negative with respect to mutation-causing potential.</p> <p>Cancer-causing potential: An long-term animal (rat) study showed that lanthanum carbonate is not carcinogenic.</p> <p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.</p> |
|---|--|

|  |   |                                 |   |
|--|---|---------------------------------|---|
| <b>Acute Toxicity</b>                    | ✗ | <b>Carcinogenicity</b>          | ✗ |
| <b>Skin Irritation/Corrosion</b>         | ✗ | <b>Reproductivity</b>           | ✗ |
| <b>Serious Eye Damage/Irritation</b>     | ✗ | <b>STOT - Single Exposure</b>   | ✗ |
| <b>Respiratory or Skin sensitisation</b> | ✗ | <b>STOT - Repeated Exposure</b> | ✗ |
| <b>Mutagenicity</b>                      | ✗ | <b>Aspiration Hazard</b>        | ✗ |

**Legend:** ✗ – Data either not available or does not fill the criteria for classification  
 ✓ – Data available to make classification

## SECTION 12 Ecological information

## Toxicity

| <b>Ammonium Cerium Sulphate Dihydrate</b> | <b>Endpoint</b>   | <b>Test Duration (hr)</b> | <b>Species</b> | <b>Value</b>  | <b>Source</b> |
|---|---|---------------------------|----------------|---------------|---------------|
|   | Not Available   | Not Available             | Not Available  | Not Available | Not Available |
| <b>cerium(IV) ammonium sulfate</b>        | <b>Endpoint</b>   | <b>Test Duration (hr)</b> | <b>Species</b> | <b>Value</b>  | <b>Source</b> |
|   | Not Available   | Not Available             | Not Available  | Not Available | Not Available |
| <b>Legend:</b>                            | Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data |                           |                |               |               |

For Inorganic Sulfate:

Environmental Fate - Sulfates can produce a laxative effect at concentrations of 1000 - 1200 mg/liter, but no increase in diarrhea, dehydration or weight loss. The presence of sulfate in drinking-water can also result in a noticeable taste. Sulfate may also contribute to the corrosion of distribution systems. No health-based guideline value for sulfate in drinking water is proposed.

Atmospheric Fate: Sulfates are removed from the air by both dry and wet deposition processes. Wet deposition processes including rain-out (a process that occurs within the clouds) and washout (removal by precipitation below the clouds) which contribute to the removal of sulfate from the atmosphere.

Terrestrial Fate: Soil - In soil, the inorganic sulfates can adsorb to soil particles or leach into surface water and groundwater. Plants - Sodium sulfate is not very toxic to terrestrial plants however; sulfates can be taken up by plants and be incorporated into the parenchyma of the plant.

Continued...

**For Metal:**

Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.

Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms. Ionic species may bind to dissolved ligands or sorb to solid particles in water.

**For Cerium:**

Environmental Fate: Despite their name, rare earth elements are relatively plentiful in the Earth's crust, with cerium being the 25th most abundant element. Cerium compounds include cerium oxide, cerium carbonate, and cerium chloride.

Atmospheric Fate: Cerium oxidizes very readily at room temperature, especially in moist air. Except for europium, cerium is the most reactive of the rare-earth metals.

Terrestrial Fate: Soil ♦ Cerium is found in minerals including allanite, monazite, cerite, and bastnaesite. Plants ♦ Crops can take up cerium.

Aquatic Fate: Cerium oxide and cerium carbonate are insoluble in water, while cerium chloride is soluble in water. Cerium has affinity for humic substances, which may alter its availability in aquatic systems.

For Lanthanoids (Formerly Lanthanides: Synonym Rare Earth Metals and their Salts):

Environmental Fate: Rare earths, such as the lanthanoids, are relatively abundant in the crust of the Earth. These elements are not ♦rare♦-scientists once thought these substances were only found in very small amounts on the Earth. Most of the lanthanides occur together in nature, and they are very difficult to separate from each other. The lanthanides form alloys, (mixtures), with many other metals, and these alloys exhibit a wide range of physical properties. Lanthanoid emissions to the environment have increased as a result of the growing industrial applications of these elements; however, robust data to evaluate the environmental fate of lanthanoids are scarce.

Atmospheric Fate: These substances react with oxygen in the atmosphere to form an oxide residue which tarnishes surfaces exposed to these elements. They burn readily in air to form oxides.

Terrestrial Fate: Soil - Lanthanoids can be found in most soils. These substances are expected to strongly sorb to soil and are not expected to evaporate from soil surfaces.

For Ammonia:

Atmospheric Fate: Ammonia reacts rapidly with available acids (mainly sulfuric, nitric, and sometimes hydrochloric acid) to form the corresponding salts. Ammonia is persistent in the air.

Aquatic Fate: Biodegrades rapidly to nitrate, producing a high oxygen demand. Non-persistent in water (half-life 2 days).

Ecotoxicity: Moderately toxic to fish under normal temperature and pH conditions and harmful to aquatic life at low concentrations. Does not concentrate in food chain.

**DO NOT discharge into sewer or waterways.**

**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**

|                                     |   |
|-------------------------------------|---|
| <b>Product / Packaging disposal</b> | <p>For small quantities:</p> <ul style="list-style-type: none"> <li>▶ Dissolve the material (in water or acid solution as appropriate) or convert it to a water soluble state with appropriate oxidising agent.</li> <li>▶ Precipitate as the sulfide, adjusting the pH to neutral to complete the precipitation.</li> <li>▶ Filter off sulfide solids for recovery or disposal to approved land-fill.</li> <li>▶ Destroy excess sulfide in solution with, for example, sodium hypochlorite, neutralise, and flush to sewer (subject to local regulation).</li> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li> <li>▶ Where in doubt contact the responsible authority.</li> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Management Authority for disposal.</li> <li>▶ Bury residue in an authorised landfill.</li> <li>▶ Recycle containers if possible, or dispose of in an authorised landfill.</li> </ul> |
|-------------------------------------|---|

**SECTION 14 Transport information****Labels Required**

|                         |                |
|-------------------------|----------------|
| <b>Marine Pollutant</b> | NO             |
| <b>HAZCHEM</b>          | 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

**SECTION 15 Regulatory information**

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

Continued...

**cerium(IV) ammonium sulfate is found on the following regulatory lists**

Australian Inventory of Industrial Chemicals (AIIC)

**National Inventory Status**

| National Inventory            | Status   |
|-------------------------------|--|
| Australia - AIIC              | Yes  |
| Australia Non-Industrial Use  | No (cerium(IV) ammonium sulfate)   |
| Canada - DSL                  | No (cerium(IV) ammonium sulfate)   |
| Canada - NDSL                 | Yes  |
| China - IECSC                 | Yes  |
| Europe - EINEC / ELINCS / NLP | Yes  |
| Japan - ENCS                  | No (cerium(IV) ammonium sulfate)   |
| Korea - KECI                  | Yes  |
| New Zealand - NZIoC           | Yes  |
| Philippines - PICCS           | Yes  |
| USA - TSCA                    | Yes  |
| Taiwan - TCSI                 | Yes  |
| Mexico - INSQ                 | No (cerium(IV) ammonium sulfate)   |
| Vietnam - NCI                 | Yes  |
| Russia - ARIPS                | No (cerium(IV) ammonium sulfate)   |
| <b>Legend:</b>                | Yes = All CAS declared ingredients are on the inventory<br>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**

|                      |            |
|----------------------|------------|
| <b>Revision Date</b> | 01/11/2019 |
| <b>Initial Date</b>  | 22/07/2016 |

**SDS Version Summary**

| Version | Issue Date | Sections Updated   |
|---------|------------|--|
| 3.1.1.1 | 01/11/2019 | One-off system update. NOTE: This may or may not change the GHS classification |

**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  
 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

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