

**CERIUM(IV) METHOXYETHOXIDE, 18-20% in methoxyethanol**

Safety Data Sheet AKC186

Date of issue: 10/20/2015

Version: 1.0

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

|                 |  |
|-----------------|--|
| Product form    | : Mixture  |
| Physical state  | : Liquid   |
| Product name    | : CERIUM(IV) METHOXYETHOXIDE, 18-20% in methoxyethanol |
| Product code    | : AKC186   |
| Formula         | : C <sub>12</sub> H <sub>28</sub> CeO <sub>8</sub>     |
| Synonyms        | : CERIUM TETRA(METHOXYETHOXIDE)                        |
| Chemical family | : METAL ALKOXIDE                                       |

**1.2. Relevant identified uses of the substance or mixture and uses advised against**

|                              |  |
|------------------------------|--|
| Use of the substance/mixture | : Chemical intermediate<br>For research use only |
|------------------------------|--|

**1.3. Details of the supplier of the safety data sheet****GELEST, INC.**11 East Steel Road  
Morrisville, PA 19067**USA**

T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST

[info@gelest.com](mailto:info@gelest.com) - [www.gelest.com](http://www.gelest.com)**1.4. Emergency telephone number**

|                  |   |
|------------------|---|
| Emergency number | : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International) |
|------------------|---|

**SECTION 2: Hazards identification****2.1. Classification of the substance or mixture****GHS-US classification**

|                                     |      |
|-------------------------------------|------|
| Flam. Liq. 3                        | H226 |
| Acute Tox. 4 (Dermal)               | H312 |
| Acute Tox. 4 (Inhalation:dust,mist) | H332 |
| Skin Irrit. 2                       | H315 |
| Eye Irrit. 2A                       | H319 |
| Repr. 1B                            | H360 |

Full text of H-phrases: see section 16

**2.2. Label elements****GHS-US labeling**

Hazard pictograms (GHS-US)



GHS02

GHS07

GHS08

Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H226 - Flammable liquid and vapor  
 H312+H332 - Harmful in contact with skin or if inhaled  
 H315 - Causes skin irritation  
 H319 - Causes serious eye irritation  
 H360 - May damage fertility or the unborn child

Precautionary statements (GHS-US)

: P201 - Obtain special instructions before use  
 P202 - Do not handle until all safety precautions have been read and understood  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection  
 P210 - Keep away from heat, open flames, sparks. - No smoking  
 P233 - Keep container tightly closed  
 P240 - Ground/bond container and receiving equipment  
 P241 - Use explosion-proof electrical equipment  
 P242 - Use only non-sparking tools  
 P243 - Take precautionary measures against static discharge  
 P261 - Avoid breathing vapors  
 P264 - Wash hands thoroughly after handling  
 P271 - Use only outdoors or in a well-ventilated area  
 P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing

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P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower  
P332+P313 - If skin irritation occurs: Get medical advice/attention  
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  
P308+P313 - If exposed or concerned: Get medical advice/attention  
P362+P364 - Take off contaminated clothing and wash it before reuse  
P370+P378 - In case of fire: Use water spray, foam, carbon dioxide, dry chemical to extinguish  
P403+P235 - Keep in a cool place  
P405 - Store locked up  
P321 - Specific treatment (see first aid instructions on this label)  
P501 - Dispose of contents/container to licensed waste disposal facility.

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Not applicable

### 3.2. Mixture

| Name                       | Product identifier   | %       | GHS-US classification  |
|----------------------------|----------------------|---------|--|
| 2-Methoxyethanol           | (CAS No) 109-86-4    | 80 - 82 | Flam. Liq. 3, H226<br>Acute Tox. 4 (Dermal), H312<br>Acute Tox. 4 (Inhalation), H332<br>Repr. 1B, H360 |
| Cerium(IV) methoxyethoxide | (CAS No) 876107-33-4 | 18 - 20 | Skin Irrit. 2, H315<br>Eye Irrit. 2A, H319   |

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : May damage fertility or the unborn child.

Symptoms/injuries after inhalation : Harmful if inhaled. May cause irritation to the respiratory tract.

Symptoms/injuries after skin contact : Causes skin irritation. Harmful in contact with skin.

Symptoms/injuries after eye contact : Causes serious eye irritation.

Symptoms/injuries after ingestion : May be harmful if swallowed.

Chronic symptoms : Methoxyethanol, a hydrolysis product, is known to have a chronic effect on the central nervous system.

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

No additional information available

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Water spray. Foam. Carbon dioxide. Dry chemical.

Unsuitable extinguishing media : Do not use straight streams.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

### 5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Use water spray to cool exposed surfaces.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

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### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Eliminate ignition sources. Use special care to avoid static electric charges.

##### 6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

##### 6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

#### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

#### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Precautions for safe handling : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.

Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

#### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Keep in a cool place. Store locked up. Protect against sunlight.

Incompatible materials : Moist air. Oxidizing agent. Water.

Storage area : Store in a well-ventilated place. Store away from heat.

#### 7.3. Specific end use(s)

No additional information available

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

| 2-Methoxyethanol (109-86-4) |                                      |                       |
|-----------------------------|--------------------------------------|-----------------------|
| USA ACGIH                   | ACGIH TWA (ppm)                      | 0.1 ppm               |
| USA NIOSH                   | NIOSH REL (TWA) (mg/m <sup>3</sup> ) | 0.3 mg/m <sup>3</sup> |
| USA NIOSH                   | NIOSH REL (TWA) (ppm)                | 0.1 ppm               |
| USA OSHA                    | OSHA PEL (TWA) (mg/m <sup>3</sup> )  | 80 mg/m <sup>3</sup>  |
| USA OSHA                    | OSHA PEL (TWA) (ppm)                 | 25 ppm                |
| USA IDLH                    | US IDLH (ppm)                        | 200 ppm               |

#### 8.2. Exposure controls

Appropriate engineering controls : Provide local exhaust or general room ventilation.

Personal protective equipment : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Avoid all unnecessary exposure.

Hand protection : Neoprene or nitrile rubber gloves.

Eye protection : Chemical goggles. Contact lenses should not be worn.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

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### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

|   |   |
|---|---|
| Physical state                              | : Liquid  |
| Appearance                                  | : Liquid.   |
| Molecular mass                              | : 440.46 g/mol                                    |
| Color                                       | : Straw to dark.                                  |
| Odor  | : Mild.   |
| Odor threshold                              | : No data available                               |
| Refractive index                            | : No data available                               |
| pH  | : No data available                               |
| Relative evaporation rate (butyl acetate=1) | : No data available                               |
| Melting point                               | : No data available                               |
| Freezing point                              | : < 0 °C  |
| Boiling point                               | : 124 - 125 °C (initial)                          |
| Flash point                                 | : 39 °C   |
| Auto-ignition temperature                   | : 288 °C (methoxyethanol)                         |
| Decomposition temperature                   | : No data available                               |
| Flammability (solid, gas)                   | : Flammable liquid and vapor                      |
| Vapor pressure                              | : 6.2 mm Hg @ 20°C (methoxyethanol)               |
| Relative vapor density at 20 °C             | : 2.6 - 2.7                                       |
| Relative density                            | : 1.02  |
| VOC content                                 | : > 75 %  |
| Solubility                                  | : Reacts with water.                              |
| Log Pow                                     | : No data available                               |
| Log Kow                                     | : No data available                               |
| Viscosity, kinematic                        | : No data available                               |
| Viscosity, dynamic                          | : No data available                               |
| Explosive properties                        | : No data available                               |
| Oxidizing properties                        | : No data available                               |
| Explosion limits                            | : 2.5 - 19.8 vol % (lower; upper: methoxyethanol) |

#### 9.2. Other information

No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No additional information available

#### 10.2. Chemical stability

Stable.

#### 10.3. Possibility of hazardous reactions

No additional information available

#### 10.4. Conditions to avoid

Heat. Sparks. Open flame.

#### 10.5. Incompatible materials

Moist air. Oxidizing agent. Water.

#### 10.6. Hazardous decomposition products

Organic acid vapors.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity : Dermal: Harmful in contact with skin. Inhalation:dust,mist: Harmful if inhaled.

| CERIUM(IV) METHOXYETHOXIDE, 18-20% in methoxyethanol (876107-33-4) |                            |
|--|----------------------------|
| ATE US (dermal)  | 1706.667 mg/kg body weight |
| ATE US (dust, mist)  | 2.000 mg/l/4h              |
| 2-Methoxyethanol (109-86-4)  |                            |
| LD50 oral rat  | 2370 mg/kg                 |
| LD50 dermal rabbit   | 1280 mg/kg                 |

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| 2-Methoxyethanol (109-86-4) |                               |
|-----------------------------|-------------------------------|
| LC50 inhalation rat (ppm)   | 1478 ppm (Exposure time: 7 h) |
| ATE US (oral)               | 2370.000 mg/kg body weight    |
| ATE US (dermal)             | 1280.000 mg/kg body weight    |
| ATE US (gases)              | 4500.000 ppmV/4h              |
| ATE US (vapors)             | 11.000 mg/l/4h                |
| ATE US (dust, mist)         | 1.500 mg/l/4h                 |

|   |  |
|---|--|
| Skin corrosion/irritation                           | : Causes skin irritation.  |
| Serious eye damage/irritation                       | : Causes serious eye irritation.   |
| Respiratory or skin sensitization                   | : Not classified   |
| Germ cell mutagenicity                              | : Not classified<br>Methoxyethanol is listed as a potential mutagen.   |
| Carcinogenicity                                     | : Not classified   |
| Reproductive toxicity                               | : May damage fertility or the unborn child.  |
| Specific target organ toxicity (single exposure)    | : Not classified   |
| Specific target organ toxicity (repeated exposure)  | : Not classified   |
| Aspiration hazard                                   | : Not classified   |
| Potential Adverse human health effects and symptoms | : Methoxyethanol can cause headaches, dizziness, drowsiness, irritation of eyes, tremor, ataxia, gastrointestinal disturbance, or weight loss. |
| Symptoms/injuries after inhalation                  | : Harmful if inhaled. May cause irritation to the respiratory tract.   |
| Symptoms/injuries after skin contact                | : Causes skin irritation. Harmful in contact with skin.  |
| Symptoms/injuries after eye contact                 | : Causes serious eye irritation.   |
| Symptoms/injuries after ingestion                   | : May be harmful if swallowed.   |
| Chronic symptoms                                    | : Methoxyethanol, a hydrolysis product, is known to have a chronic effect on the central nervous system.                                       |
| Reason for classification                           | : Expert judgment  |

## SECTION 12: Ecological information

### 12.1. Toxicity

| 2-Methoxyethanol (109-86-4) |  |
|-----------------------------|--|
| LC50 fish 1                 | 10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static]) |
| LC50 fish 2                 | 9650 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])  |

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

| 2-Methoxyethanol (109-86-4) |       |
|-----------------------------|-------|
| Log Pow                     | -0.85 |

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

|                              |  |
|------------------------------|--|
| Effect on ozone layer        | : No additional information available                |
| Effect on the global warming | : No known ecological damage caused by this product. |

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

|                                 |  |
|---------------------------------|--|
| Sewage disposal recommendations | : Do not dispose of waste into sewer.  |
| Waste disposal recommendations  | : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility. |
| Ecology - waste materials       | : Avoid release to the environment.  |

## SECTION 14: Transport information

### 14.1. UN number

|             |        |
|-------------|--------|
| UN-No.(DOT) | : 1993 |
| DOT NA no.  | UN1993 |

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### 14.2. UN proper shipping name

Proper Shipping Name (DOT) : Flammable liquids, n.o.s.  
(CERIUM(IV) METHOXYETHOXIDE, 18-20% in methoxyethanol)

Transport hazard class(es) (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120

Hazard labels (DOT) : 3 - Flammable liquid



DOT Symbols : G - Identifies PSN requiring a technical name

Packing group (DOT) : III - Minor Danger

DOT Packaging Exceptions (49 CFR 173.xxx) : 150

DOT Packaging Non Bulk (49 CFR 173.xxx) : 203

DOT Packaging Bulk (49 CFR 173.xxx) : 242

### 14.3. Additional information

Other information : No supplementary information available.

### Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

### Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 60 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 220 L

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### CERIUM(IV) METHOXYETHOXIDE, 18-20% in methoxyethanol (876107-33-4)

|                          |   |
|--------------------------|---|
| TSCA Exemption/Exclusion | CAUTION: This material is supplied for research and development purposes subject to the R&D exemption under TSCA, 40 CFR 720.36, and must meet the requirements of the exemption, including supervision by a "technically qualified individual" as defined by 40 CFR 720.3(ee). The use of this material for "commercial purposes" as defined by 40 CFR 720.3(r) is not permitted in the United States. |
|--------------------------|---|

#### 2-Methoxyethanol (109-86-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Subject to reporting requirements of United States SARA Section 313

|                          |  |
|--------------------------|--|
| EPA TSCA Regulatory Flag | S - S - indicates a substance that is identified in a proposed or final Significant New Uses Rule. |
|--------------------------|--|

|                                       |       |
|---------------------------------------|-------|
| SARA Section 313 - Emission Reporting | 1.0 % |
|---------------------------------------|-------|

#### Cerium(IV) methoxyethoxide (876107-33-4)

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### 2-Methoxyethanol (109-86-4)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on the Canadian DSL (Domestic Substances List)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Japanese Pollutant Release and Transfer Register Law (PRTR Law)  
Listed on the Canadian IDL (Ingredient Disclosure List)  
Listed on INSQ (Mexican national Inventory of Chemical Substances)  
Listed on Turkish inventory of chemical

#### Cerium(IV) methoxyethoxide (876107-33-4)



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### 15.3. US State regulations

| CERIUM(IV) METHOXYETHOXIDE, 18-20% in methoxyethanol(876107-33-4)   |    |
|---|----|
| U.S. - California - Proposition 65 - Carcinogens List               | No |
| U.S. - California - Proposition 65 - Developmental Toxicity         | No |
| U.S. - California - Proposition 65 - Reproductive Toxicity - Female | No |
| U.S. - California - Proposition 65 - Reproductive Toxicity - Male   | No |

### 2-Methoxyethanol (109-86-4)

| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | Non-significant risk level (NSRL) |
|---|---|---|---|-----------------------------------|
| No  | Yes   | No  | Yes   |                                   |

### Cerium(IV) methoxyethoxide (876107-33-4)

| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | Non-significant risk level (NSRL) |
|---|---|---|---|-----------------------------------|
| No  | No  | No  | No  |                                   |

## SECTION 16: Other information

### Abbreviations and acronyms

: Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development.

### Full text of H-phrases::

|                                     |  |
|-------------------------------------|--|
| Acute Tox. 4 (Dermal)               | Acute toxicity (dermal) Category 4               |
| Acute Tox. 4 (Inhalation)           | Acute toxicity (inhalation) Category 4           |
| Acute Tox. 4 (Inhalation:dust,mist) | Acute toxicity (inhalation:dust,mist) Category 4 |
| Eye Irrit. 2A                       | Serious eye damage/eye irritation Category 2A    |
| Flam. Liq. 3                        | Flammable liquids Category 3                     |
| Repr. 1B                            | Reproductive toxicity Category 1B                |
| Skin Irrit. 2                       | Skin corrosion/irritation Category 2             |
| H226                                | Flammable liquid and vapor                       |
| H312                                | Harmful in contact with skin                     |
| H315                                | Causes skin irritation                           |
| H319                                | Causes serious eye irritation                    |
| H332                                | Harmful if inhaled                               |
| H360                                | May damage fertility or the unborn child         |

### HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given  
Flammability : 3 Serious Hazard  
Physical : 1 Slight Hazard

Prepared by safety and environmental affairs.

Date of issue: 10/20/2015 Version: 1.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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