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

**Product information**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>: E-Series® Catalyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>1108682, 1108006, 1106530, 1104405, 1076780, 1104142, 1092175, 1077170, 1078352, 1078354, 1098646, 1093052, 1078358, 1061165, 1078353, 1078356, 1078359, 1070831, 1070922, 1092176, 1078361, 1078340, 1036631, 1017842, 1035484, 1078353, 1078356, 1078359, 1078358, 1016708, 1017939, 1031451, 1033973, 1033974, 1034361, 1036632, 1016707</td>
</tr>
</tbody>
</table>

**Use**

| : Chemical intermediate |

**Company**

| : Chevron Phillips Chemical Company LP Specialty Chemicals 10001 Six Pines Drive The Woodlands, TX 77380 |

**Local**

| : CHEVRON PHILLIPS CHEMICALS ASIA PTE. LTD. C/O DONG WOO CORPORATION #B-2601,JEONGJAIL-RO, BUNDANG-GU,SEONGNAMI-SI, GYEONGGI-DO,13557 SOUTH KOREA Telephone no.: +612-9186-1132 |

**Emergency telephone:**

**Health:**

866.442.9628 (North America) 1.832.813.4984 (International) CHEMTREC 800.424.9300 or 703.527.3887(int'l)

**Transport:**

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090 EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax) Mexico CHEMTREC 01-800-681-9531 (24 hours) South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600 Argentina: +(54)-1159839431

**Responsible Department**

| : Product Safety and Toxicology Group |

**E-mail address**

| : SDS@CPChem.com |

**Website**

| : www.CPChem.com |

SDS Number: 100000014208
SECTION 2: Hazards identification

Classification of the substance or mixture

Standards for classification and labeling of chemical substances and material safety data sheet (ministry of employment and labor public notice No. 2016-19) (GHS 2011)

Classification

: Specific target organ toxicity - single exposure, Category 3,
  Respiratory system
Specific target organ toxicity - repeated exposure, Category 1,
  Inhalation, Lungs

Labeling

Symbol(s)

: 

Signal Word

: Danger

Hazard Statements

: H335: May cause respiratory irritation.
  H372: Causes damage to organs (Lungs) through prolonged or
  repeated exposure if inhaled.

Precautionary Statements

: Prevention:
  P264: Wash the contact area thoroughly after handling.
  P270: Do not eat, drink or smoke when using this product.
  P271: Use only outdoors or in a well-ventilated area.
Response:
  P304 + P340 + P312: IF INHALED: Remove victim to fresh
  air and keep at rest in a position comfortable for breathing. Call
  a POISON CENTER or doctor/physician if you feel unwell.
  P314: Get medical advice/attention if you feel unwell.
Storage:
  P403 + P233: Store in a well-ventilated place. Keep container
  tightly closed.
  P405: Store locked up.
Disposal:
  P501: Dispose of contents and container according to wastes
  control act.

SECTION 3: Composition/information on ingredients

Synonyms

: Selective Hydrogenation Catalyst
  ARU Catalyst
  Acetylene Removal Unit Catalyst
  FE E-DC-3
  FE E-DC-2
  FE E-RG-1
  BE-1
  BE-2
  CPChem E Series

SDS Number: 1000000014208
SECTION 4: First aid measures

General advice : No hazards which require special first aid measures.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water. Call a physician if irritation develops or persists.

In case of eye contact : Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

SECTION 5: Firefighting measures

Flash point : Not applicable

Autoignition temperature : No data available

Unsuitable extinguishing media : High volume water jet.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Fire and explosion protection : Provide appropriate exhaust ventilation at places where dust is formed.

Hazardous decomposition products : Metal Oxides.

SECTION 6: Accidental release measures

Personal precautions : Avoid dust formation.

Environmental precautions : If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up: Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling: For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.

Advice on protection against fire and explosion: Provide appropriate exhaust ventilation at places where dust is formed.

Storage

Requirements for storage areas and containers: Electrical installations / working materials must comply with the technological safety standards.

Advice on common storage: No materials to be especially mentioned.

German storage class: Combustible Solids

Use: Chemical intermediate

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>KR OEL</td>
<td>TWA</td>
<td>10 mg/m3</td>
<td></td>
</tr>
</tbody>
</table>

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into
consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Safety glasses.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Hygiene measures : General industrial hygiene practice.

### SECTION 9: Physical and chemical properties

#### Information on basic physical and chemical properties

**Appearance**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Pellets</td>
</tr>
<tr>
<td>Physical state</td>
<td>Solid</td>
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<tr>
<td>Color</td>
<td>White to off-white</td>
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</table>

**Safety data**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
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</tr>
<tr>
<td>Lower explosion limit</td>
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</tr>
<tr>
<td>Upper explosion limit</td>
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</tr>
<tr>
<td>Oxidizing properties</td>
<td>No</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>Mixture</td>
</tr>
<tr>
<td>Molecular weight</td>
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<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Pour point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling point.boiling range</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
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<tr>
<td>Density</td>
<td>70 - 80 LB/FT3</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
SECTION 10: Stability and reactivity

Reactivity : Stable under recommended storage conditions.

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions : Hazardous reactions: Hazardous polymerization does not occur.

Hazardous reactions: Dust may form explosive mixture in air., Reacts violently with water.

Further information: Stable under recommended storage conditions., No hazards to be specially mentioned.

Conditions to avoid

Hazardous decomposition products : Generation of Ducts.

Metal Oxides

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

E-Series® Catalyst

Acute oral toxicity : LD50: > 5,000 mg/kg
Species: Rat

Acute inhalation toxicity

Aluminum Oxide : LC50: > 2.3 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Information given is based on data obtained from similar substances.

E-Series® Catalyst

Acute dermal toxicity : LD50: not known Species: Rabbit
**E-Series® Catalyst**

**Skin irritation** : No skin irritation

**Eye irritation** : No eye irritation

Product dust may be irritating to eyes, skin and respiratory system.

**Genotoxicity in vitro**

**Aluminum Oxide**
- Test Type: Ames test
- Metabolic activation: with and without metabolic activation
- Result: negative

**Further information** : No data available.

### SECTION 12: Ecological information

**Ecotoxicity effects**

**Toxicity to fish**
- **Aluminum Oxide**
  - NOEC: > 100 mg/l
  - Exposure time: 96 h
  - Species: Salmo salar (Atlantic salmon)
  - Method: OECD Test Guideline 203

**Toxicity to daphnia and other aquatic invertebrates**
- **Aluminum Oxide**
  - EC50: > 100 mg/l
  - Exposure time: 48 h
  - Species: Daphnia magna (Water flea)
  - Method: OECD Test Guideline 202

**Toxicity to algae**
- **Aluminum Oxide**
  - NOEC: > 100 mg/l
  - Exposure time: 72 h
  - Species: Selenastrum capricornutum (algae)
  - Method: OECD Test Guideline 201

**Biodegradability** : No data available

**Elimination information (persistence and degradability)**

**Bioaccumulation** : Not applicable

**Mobility** : No data available
E-Series® Catalyst

Additional ecological information
Ecotoxicology Assessment

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped. Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product: Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.
ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

National legislation
Regulation under the Occupational Safety and Health Act
A Material Safety Datasheet (MSDS) for this product is not required according to article 41 of the ISHA.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmful Substances Prohibited from Manufacturing</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Harmful Substances Required Permission for Manufacture</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxic Chemicals</td>
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<tr>
<td>Prohibited Chemicals</td>
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<td></td>
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<tr>
<td>Observational chemicals</td>
<td>Not relevant</td>
<td></td>
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<tr>
<td>Restricted Chemicals</td>
<td>Not applicable</td>
<td></td>
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<tr>
<td>Toxic Release Inventory</td>
<td>Alumina Oxide</td>
<td>&gt;= 1%</td>
</tr>
</tbody>
</table>

Dangerous Substances Safety Management Act
Dangerous Substances : Not Applicable to Dangerous Materials
Safety Management Act

Notification status
Europe  REACH : A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.

Switzerland  CH INV : On the inventory, or in compliance with the inventory
United States of America (USA)  TSCA : On or in compliance with the active portion of the TSCA inventory
Canada  DSL : All components of this product are on the Canadian DSL
Australia  AICS : On the inventory, or in compliance with the inventory
New Zealand  NZIoC : On the inventory, or in compliance with the inventory
Japan  ENCS : On the inventory, or in compliance with the inventory

SDS Number: 100000014208
Korea KECI: A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.

Philippines PICCS: On the inventory, or in compliance with the inventory

China IECSC: On the inventory, or in compliance with the inventory

Taiwan TCSI: On the inventory, or in compliance with the inventory

SECTION 16: Other information

Further information

Legacy SDS Number: 659990

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
</tr>
<tr>
<td>AICS</td>
<td>Australia, Inventory of Chemical Substances</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>DSL</td>
<td>Canada, Domestic Substances List</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
</tr>
<tr>
<td>NDSL</td>
<td>Canada, Non-Domestic Substances List</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstract Service</td>
</tr>
<tr>
<td>NZIoC</td>
<td>New Zealand Inventory of Chemicals</td>
</tr>
<tr>
<td>EC50</td>
<td>Effective Concentration</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
</tr>
<tr>
<td>EC50%</td>
<td>Effective Concentration 50%</td>
</tr>
<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
</tr>
<tr>
<td>EGEST</td>
<td>EOSCA Generic Exposure Scenario Tool</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
</tr>
<tr>
<td>EOSCA</td>
<td>European Oilfield Specialty Chemicals Association</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Chemical Substances</td>
</tr>
<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
</tr>
<tr>
<td>MAK</td>
<td>Germany Maximum Concentration Values</td>
</tr>
<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
</tr>
<tr>
<td>GHS</td>
<td>Globally Harmonized System</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater Than or Equal To</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>IC50%</td>
<td>Inhibition Concentration 50%</td>
</tr>
<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act.</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
</tr>
</tbody>
</table>
### E-Series® Catalyst

**Version 1.8**  
**Revision Date 2019-10-17**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
</tr>
<tr>
<td>KECI</td>
<td>Korea, Existing Chemical Inventory</td>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
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<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
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