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

1.1 Product identifiers

<table>
<thead>
<tr>
<th>Product name</th>
<th>Diethylzinc solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Number</td>
<td>296112</td>
</tr>
<tr>
<td>Brand</td>
<td>Aldrich</td>
</tr>
</tbody>
</table>

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

Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone

Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

- Flammable liquids (Category 2), H225
- Pyrophoric liquids (Category 1), H250
- Chemicals which, in contact with water, emit flammable gases (Category 1), H260
- Skin corrosion (Category 1B), H314
- Serious eye damage (Category 1), H318
- Reproductive toxicity (Category 2), H361
- Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
- Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Nervous system, H373
- Aspiration hazard (Category 1), H304
- Short-term (acute) aquatic hazard (Category 2), H401
- Long-term (chronic) aquatic hazard (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.
2.2 **GHS Label elements, including precautionary statements**

**Pictogram**

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Danger</th>
</tr>
</thead>
</table>

**Hazard statement(s)**

- **H225**: Highly flammable liquid and vapor.
- **H250**: Catches fire spontaneously if exposed to air.
- **H260**: In contact with water releases flammable gases which may ignite spontaneously.
- **H304**: May be fatal if swallowed and enters airways.
- **H314**: Causes severe skin burns and eye damage.
- **H336**: May cause drowsiness or dizziness.
- **H361**: Suspected of damaging fertility or the unborn child.
- **H373**: May cause damage to organs (Nervous system) through prolonged or repeated exposure if inhaled.
- **H411**: Toxic to aquatic life with long lasting effects.

**Precautionary statement(s)**

- **P201**: Obtain special instructions before use.
- **P202**: Do not handle until all safety precautions have been read and understood.
- **P210**: Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
- **P222**: Do not allow contact with air.
- **P223**: Do not allow contact with water.
- **P231 + P232**: Handle under inert gas. Protect from moisture.
- **P233**: Keep container tightly closed.
- **P240**: Ground/bond container and receiving equipment.
- **P241**: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
- **P242**: Use only non-sparking tools.
- **P243**: Take precautionary measures against static discharge.
- **P260**: Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
- **P264**: Wash skin thoroughly after handling.
- **P271**: Use only outdoors or in a well-ventilated area.
- **P273**: Avoid release to the environment.
- **P303 + P353**: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- **P304 + P340 + P310**: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
- **P305 + P351 + P338 + P310**: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
- **P308 + P313**: IF exposed or concerned: Get medical advice/ attention.
- **P335 + P334**: Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
- **P363**: Wash contaminated clothing before reuse.
- **P370 + P378**: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
Reacts violently with water.

SECTION 3: Composition/information on ingredients

3.2 Mixtures
Synonyms : Zincdiethyl

Formula : C₄H₁₀Zn
Molecular weight : 123.51 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>110-54-3</td>
<td></td>
</tr>
<tr>
<td>EC-No.</td>
<td>203-777-6</td>
<td></td>
</tr>
<tr>
<td>Index-No.</td>
<td>601-037-00-0</td>
<td></td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119480412-44-XXXX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flam. Liq. 2; Skin Irrit. 2; Repr. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H225, H315, H361, H336, H373, H304, H401, H411 Concentration limits: &gt;= 5 %: STOT RE 2, H373; &gt;= 20 %: STOT SE 3, H336;</td>
<td>&gt;= 70 - &lt; 90 %</td>
</tr>
</tbody>
</table>

| diethylzinc    |                |               |
| CAS-No.        | 557-20-0       |               |
| EC-No.         | 209-161-3      |               |
| Index-No.      | 030-004-00-8   |               |
|                | Pyr. Liq. 1; 1; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 1; Aquatic Chronic 1; H250, H260, H314, H318, H400, H410 | >= 10 - < 20 % |

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.
In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Pulmonary failure possible after aspiration of vomit. Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
Water Foam

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Zinc/zinc oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
May not get in touch with: Water
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.
6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols. Keep workplace dry. Do not allow product to come into contact with water.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep away from heat and sources of ignition. Never allow product to get in contact with water during storage.

Air sensitive.

Storage class
Storage class (TRGS 510): 4.2: Pyrophoric and self-heating hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>110-54-3</td>
<td>TWA</td>
<td>50 ppm</td>
<td>USA, ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remarks</td>
<td>Danger of cutaneous absorption</td>
<td></td>
</tr>
</tbody>
</table>
### Limits for Air Contaminants

<table>
<thead>
<tr>
<th></th>
<th>TWA</th>
<th>Value</th>
<th>USA, NIOSH Recommended Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA</td>
<td>50 ppm</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td></td>
<td>500 ppm</td>
<td>1,800 mg/m³</td>
<td>USA, Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td>PEL</td>
<td>50 ppm</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td></td>
<td>50 ppm</td>
<td>1,800 mg/m³</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
</tbody>
</table>

### Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Parameters</th>
<th>Value</th>
<th>Biological specimen</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>110-54-3</td>
<td>2,5-Hexanedione</td>
<td>0.5 mg/l</td>
<td>Urine</td>
<td>ACGIH - Biological Exposure Indices (BEI)</td>
</tr>
</tbody>
</table>

**Remarks**

End of shift

### 8.2 Exposure controls

**Appropriate engineering controls**
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

**Personal protective equipment**

**Eye/face protection**
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Splash contact**
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 60 min
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Flame retardant antistatic protective clothing.

**Respiratory protection**
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains. Risk of explosion.

### SECTION 9: Physical and chemical properties

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

- **a)** Appearance  
  Form: liquid
- **b)** Odor  
  No data available
- **c)** Odor Threshold  
  No data available
- **d)** pH  
  No data available
- **e)** Melting point/freezing point  
  No data available
- **f)** Initial boiling point and boiling range  
  No data available
- **g)** Flash point  
  -23 °C (-9 °F) - closed cup
- **h)** Evaporation rate  
  No data available
- **i)** Flammability (solid, gas)  
  No data available
- **j)** Upper/lower flammability or explosive limits  
  No data available
- **k)** Vapor pressure  
  No data available
- **l)** Vapor density  
  No data available
- **m)** Density  
  0.726 g/cm³
  Relative density  
  No data available
- **n)** Water solubility  
  No data available
- **o)** Partition coefficient: n-octanol/water  
  No data available
- **p)** Autoignition temperature  
  No data available
- **q)** Decomposition temperature  
  No data available
- **r)** Viscosity  
  No data available
- **s)** Explosive properties  
  Not classified as explosive.
- **t)** Oxidizing properties  
  none

#### 9.2 Other safety information
No data available
SECTION 10: Stability and reactivity

10.1 Reactivity
Vapors may form explosive mixture with air.

10.2 Chemical stability
Sensitive to air. Sensitive to moisture

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Exposure to air.
Warming.
Moisture.

10.5 Incompatible materials
Oxidizing agents, Strong oxidizing agents, Reacts violently with water.

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Mixture

Acute toxicity
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Acute toxicity estimate Dermal - 3,012 mg/kg
(Calculation method)

Skin corrosion/irritation
Remarks: Mixture causes burns.

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.
Reproductive toxicity
Suspected of damaging the unborn child.
Suspected of damaging fertility.

Specific target organ toxicity - single exposure
Mixture may cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure. - Nervous system

Aspiration hazard
Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

11.2 Additional Information
Warning: contains n-hexane (CAS#110-54-3) a suspected neurotoxin., Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache
Other dangerous properties can not be excluded.

This substance should be handled with particular care.
Handle in accordance with good industrial hygiene and safety practice.

Components
n-Hexane

Acute toxicity
LD50 Oral - Rat - male and female - 16,000 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - 4 h - 172 mg/l - vapor
Remarks: (RTECS)
LD50 Dermal - Rabbit - male - > 2,000 mg/kg
(OECD Test Guideline 402)
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 24 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation - 72 h
(OECD Test Guideline 405)

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
No data available
Test Type: Ames test
Test system: Salmonella typhimurium
Result: negative
Species: Mouse - male
Result: negative
Remarks: (ECHA)

**Carcinogenicity**

No data available

**Reproductive toxicity**
Overexposure may cause reproductive disorder(s) based on tests with laboratory animals. Suspected human reproductive toxicant Suspected of damaging fertility. Suspected of damaging fertility.

**Specific target organ toxicity - single exposure**
May cause drowsiness or dizziness. - Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Specific target organ toxicity - repeated exposure**
Inhalation - May cause damage to organs through prolonged or repeated exposure. - Nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Aspiration hazard**
May be fatal if swallowed and enters airways. Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

diethylzinc

**Acute toxicity**
Oral: No data available
Inhalation: Corrosive to respiratory system.
Inhalation: No data available
Dermal: No data available

**Skin corrosion/irritation**
Remarks: Causes skin burns.
(Regulation (EC) No 1272/2008, Annex VI)

**Serious eye damage/eye irritation**
Remarks: Causes serious eye damage.

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
No data available

**Carcinogenicity**
No data available

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
No data available
Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

SECTION 12: Ecological information

12.1 Toxicity
Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

Components

n-Hexane
Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 2.5 mg/l - 96 h
Remarks: (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 2.1 mg/l - 48 h
Remarks: (Lit.)

diethylzinc
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.
SECTION 14: Transport information

DOT (US)
UN number: 3399   Class: 4.3 (3)   Packing group: I
Proper shipping name: Organometallic substance, liquid, water-reactive, flammable (n-Hexane, diethylzinc)
Reportable Quantity (RQ):
   Poison Inhalation Hazard: No

IMDG
UN number: 3399   Class: 4.3 (3)   Packing group: I   EMS-No: F-G, S-N
Proper shipping name: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (diethylzinc, n-Hexane)
Marine pollutant: yes

IATA
UN number: 3399   Class: 4.3 (3)   Packing group: I
Proper shipping name: Organometallic substance, liquid, water-reactive, flammable (diethylzinc, n-Hexane)
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>110-54-3</td>
<td>2020-07-14</td>
</tr>
<tr>
<td></td>
<td>557-20-0</td>
<td>2007-03-01</td>
</tr>
<tr>
<td>diethylzinc</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SARA 311/312 Hazards
Fire Hazard, Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
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Pennsylvania Right To Know Components

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<tr>
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<td>2007-03-01</td>
</tr>
<tr>
<td>diethylzinc</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
California Prop. 65 Components
Components, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Hexane

CAS-No. 110-54-3
Revision Date 2017-12-29

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.9 Revision Date: 02/07/2023 Print Date: 12/02/2023