1 Identification

· Product identifier
· Trade name: Octafluoronaphthalene Solution 1
· Part number: LECO-039-1
· Application of the substance / the mixture Laboratory chemicals

· Details of the supplier of the safety data sheet
· Manufacturer/Supplier: ULTRA Scientific, Inc.
  250 Smith Street
  North Kingstown, RI  02852
  USA

· Information department:
  Telephone: (401) 294-9400
  Fax:  (401) 295-2300
  E-mail:  regulatory@ultrasci.com
· Emergency telephone number:
  US: +1-800-424-9300
  Outside US: +1-703-527-3887

2 Hazard(s) identification

· Classification of the substance or mixture
  
  GHS02 Flame
  Flam. Liq. 2 H225 Highly flammable liquid and vapor.

  GHS08 Health hazard
  Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.

  GHS07
  Skin Irrit. 2 H315 Causes skin irritation.
  STOT SE 3 H336 May cause drowsiness or dizziness.

· Label elements
· GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms

  GHS02  GHS07  GHS08

· Signal word Danger

· Hazard-determining components of labeling:
  2,2,4-trimethylpentane
· Hazard statements
  Highly flammable liquid and vapor.

(Contd. on page 2)
Causes skin irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.

**Precautionary statements**
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting/equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Avoid breathing dust/fume/gas/mist/vapors/spray
- Wash thoroughly after handling.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves/protective clothing/eye protection/face protection.
- If swallowed: Immediately call a poison center/doctor.
- If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- Call a poison center/doctor if you feel unwell.
- Specific treatment (see on this label).
- Do NOT induce vomiting.
- If skin irritation occurs: Get medical advice/attention.
- Take off contaminated clothing and wash it before reuse.
- In case of fire: Use for extinction: CO2, powder or water spray.
- Store in a well-ventilated place. Keep container tightly closed.
- Store in a well-ventilated place. Keep cool.
- Store locked up.
- Dispose of contents/container in accordance with local/regional/national/international regulations.

**Classification system:**

**NFPA ratings (scale 0 - 4)**
- Health = 1
- Fire = 3
- Reactivity = 0

**HMIS-ratings (scale 0 - 4)**
- Health = 1
- Fire = 3
- Reactivity = 0

**Other hazards**

**Results of PBT and vPvB assessment**
- **PBT**: Not applicable.
- **vPvB**: Not applicable.

**3 Composition/information on ingredients**

- **Chemical characterization**: Mixtures
- **Description**: Mixture of the substances listed below with nonhazardous additions.

**Dangerous components:**

| 540-84-1 2,2,4-trimethylpentane | 100.0% |

(Contd. on page 3)
4 First-aid measures

- Description of first aid measures
  - **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
  - **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
  - **After eye contact:** Rinse opened eye for several minutes under running water.
  - **After swallowing:** If symptoms persist consult doctor.

- Information for doctor:
  - **Most important symptoms and effects, both acute and delayed** No further relevant information available.
  - **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
  - **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  - **For safety reasons unsuitable extinguishing agents:** Water with full jet

- Special hazards arising from the substance or mixture No further relevant information available.

- Advice for firefighters
  - **Protective equipment:** No special measures required.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures
  - Wear protective equipment. Keep unprotected persons away.

- Environmental precautions: Do not allow to enter sewers/ surface or ground water.

- Methods and material for containment and cleaning up:
  - Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  - Dispose contaminated material as waste according to item 13.

- Reference to other sections
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.

- Protective Action Criteria for Chemicals
  - **PAC-1:**
    - 540-84-1 2,2,4-trimethylpentane 230 ppm
  - **PAC-2:**
    - 540-84-1 2,2,4-trimethylpentane 830 ppm
  - **PAC-3:**
    - 540-84-1 2,2,4-trimethylpentane 5000* ppm

7 Handling and storage

- Handling:
  - **Precautions for safe handling** No special precautions are necessary if used correctly.

- Information about protection against explosions and fires:
  - Keep ignition sources away - Do not smoke.
### Conditions for safe storage, including any incompatibilities

- **Storage:**
  - **Requirements to be met by storerooms and receptacles:** Store in a cool location.
  - **Information about storage in one common storage facility:** Not required.
  - **Further information about storage conditions:**
    - Keep receptacle tightly sealed.
    - Store in cool, dry conditions in well sealed receptacles.
  - **Specific end use(s)**: No further relevant information available.

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### 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**
  - **Components with limit values that require monitoring at the workplace:**
    - **540-84-1 2,2,4-trimethylpentane**
      - **PEL** Long-term value: 2350 mg/m³, 500 ppm
        - n-Octane only
      - **TLV** Long-term value: 1401 mg/m³, 300 ppm

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
  - **General protective and hygienic measures:**
    - Keep away from foodstuffs, beverages and feed.
    - Immediately remove all soiled and contaminated clothing.
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the skin.
    - Avoid contact with the eyes and skin.
  - **Breathing equipment:** Not required.
  - **Protection of hands:**
    - **Protective gloves**
      - The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product 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.
      - **Penetration time of glove material**
        - The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
  - **Eye protection:**
    - **Tightly sealed goggles**
9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
- Appearance:
  - Form: Fluid
  - Color: Colorless
- Odor:
  - Odor: Nearly odorless
- Odor threshold: Not determined.
- pH-value: Not determined.
- Change in condition
  - Melting point/Melting range: -107 °C (-160.6 °F)
  - Boiling point/Boiling range: 99 °C (210.2 °F)
- Flash point: -12 °C (10.4 °F)
- Flammability (solid, gaseous): Not applicable.
- Ignition temperature: 410 °C (770 °F)
- Decomposition temperature: Not determined.
- Auto igniting: Product is not selfigniting.
- Danger of explosion: Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
- Explosion limits:
  - Lower: 1.1 Vol %
  - Upper: 6 Vol %
- Vapor pressure at 20 °C (68 °F): 41.25 hPa (30.9 mm Hg)
- Density at 20 °C (68 °F): 0.692 g/cm³ (5.77474 lbs/gal)
- Relative density: Not determined.
- Vapor density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with Water: Not miscible or difficult to mix.
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - Dynamic at 20 °C (68 °F): 0.51 mPas
  - Kinematic: Not determined.
- Solvent content:
  - Organic solvents: 100.0 %
  - VOC content: 100.00 %
  - Solids content: 0.0 %
- Other information: No further relevant information available.

10 Stability and reactivity

- Reactivity: No further relevant information available.
Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Possibility of hazardous reactions: No dangerous reactions known.
Conditions to avoid: No further relevant information available.
Incompatible materials: No further relevant information available.
Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

Information on toxicological effects
Acute toxicity:

- LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>ATE (Acute Toxicity Estimate)</th>
<th>Dermal LD50</th>
<th>Inhalative LC50/4 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal</td>
<td>&gt;2,000 mg/kg (rabbit)</td>
<td>&gt;33.5 mg/L (rat)</td>
</tr>
<tr>
<td>Oral</td>
<td>&gt;5,000 mg/kg (rat)</td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>&gt;2,000 mg/kg (rabbit)</td>
<td></td>
</tr>
<tr>
<td>Inhalative</td>
<td>&gt;33.52 mg/L (rat)</td>
<td></td>
</tr>
</tbody>
</table>

540-84-1 2,2,4-trimethylpentane
Oral LD50 >5,000 mg/kg (rat)
Dermal LD50 >2,000 mg/kg (rabbit)
Inhalative LC50/4 h >33.52 mg/L (rat)

Primary irritant effect:
- on the skin: Irritant to skin and mucous membranes.
- on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
The product shows the following dangers according to internally approved calculation methods for preparations: Irritant

Carcinogenic categories

- IARC (International Agency for Research on Cancer)
  None of the ingredients is listed.
- NTP (National Toxicology Program)
  None of the ingredients is listed.
- OSHA-Ca (Occupational Safety & Health Administration)
  None of the ingredients is listed.

12 Ecological information

Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- Additional ecological information:
- General notes:
  Water hazard class 2 (Self-assessment): hazardous for water
  Do not allow product to reach ground water, water course or sewage system.
  Danger to drinking water if even small quantities leak into the ground.
Trade name: Octafluoronaphthalene Solution 1

- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, IMDG, IATA UN1262
- UN proper shipping name
  - DOT Octanes solution
  - IMDG OCTANES solution, MARINE POLLUTANT
  - IATA OCTANES solution
- Transport hazard class(es)
  - DOT
    - Class 3 Flammable liquids
    - Label 3
  - IMDG
    - Class 3 Flammable liquids
    - Label 3
  - IATA
    - Class 3 Flammable liquids
    - Label 3

(Contd. on page 8)
**Trade name: Octafluoronaphthalene Solution 1**

- **Packing group**  
  DOT, IMDG, IATA  
  II

- **Environmental hazards:**  
  Product contains environmentally hazardous substances: 2,2,4-trimethylpentane

- **Marine pollutant:**  
  Symbol (fish and tree)

- **Special precautions for user**  
  Warning: Flammable liquids

- **Danger code (Kemler):**  
  33

- **EMS Number:**  
  F-E,S-E

- **Stowage Category:**  
  B

- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**  
  Not applicable.

- **Transport/Additional information:**

  - **DOT**  
    - **Quantity limitations**  
      - On passenger aircraft/rail: 5 L  
      - On cargo aircraft only: 60 L

  - **IMDG**  
    - **Limited quantities (LQ)**  
      - 1L  
    - **Excepted quantities (EQ)**  
      - Code: E2  
      - Maximum net quantity per inner packaging: 30 ml  
      - Maximum net quantity per outer packaging: 500 ml

- **UN "Model Regulation":**  
  UN 1262 OCTANES SOLUTION, 3, II, ENVIRONMENTALLY HAZARDOUS

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**15 Regulatory information**

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

  - **Sara**

    - **Section 355 (extremely hazardous substances):**  
      None of the ingredients is listed.

    - **Section 313 (Specific toxic chemical listings):**  
      None of the ingredients is listed.

  - **TSCA (Toxic Substances Control Act):**  
    540-84-1 2,2,4-trimethylpentane

  - **TSCA new (21st Century Act) (Substances not listed)**

  - **Proposition 65**

  - **Chemicals known to cause cancer:**  
    None of the ingredients is listed.

  - **Chemicals known to cause reproductive toxicity for females:**  
    None of the ingredients is listed.

  - **Chemicals known to cause reproductive toxicity for males:**  
    None of the ingredients is listed.

  - **Chemicals known to cause developmental toxicity:**  
    None of the ingredients is listed.
Trade name: Octafluoronaphthalene Solution 1

- **Carcinogenic categories**

- **EPA (Environmental Protection Agency)**
  
  540-84-1 2,2,4-trimethylpentane

- **TLV (Threshold Limit Value established by ACGIH)**
  None of the ingredients is listed.

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
  None of the ingredients is listed.

- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**

  ![GHS pictograms]

  GHS02  GHS07  GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  2,2,4-trimethylpentane

- **Hazard statements**
  Highly flammable liquid and vapor.
  Causes skin irritation.
  May cause drowsiness or dizziness.
  May be fatal if swallowed and enters airways.

- **Precautionary statements**
  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  Ground/bond container and receiving equipment.
  Use explosion-proof electrical/ventilating/lighting/equipment.
  Use only non-sparking tools.
  Take precautionary measures against static discharge.
  Avoid breathing dust/fume/gas/mist/vapors/spray
  Wash thoroughly after handling.
  Use only outdoors or in a well-ventilated area.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If swallowed: Immediately call a poison center/doctor.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  Call a poison center/doctor if you feel unwell.
  Specific treatment (see on this label).
  Do NOT induce vomiting.
  If skin irritation occurs: Get medical advice/attention.
  Take off contaminated clothing and wash it before reuse.
  In case of fire: Use for extinction: CO₂, powder or water spray.
  Store in a well-ventilated place. Keep container tightly closed.
  Store in a well-ventilated place. Keep cool.
  Store locked up.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

(Contd. of page 8)
16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Date of preparation / last revision**: 04/30/2018 / -
- **Abbreviations and acronyms:**
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - ELINCS: European List of Notified Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - VOC: Volatile Organic Compounds (USA, EU)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - NIOSH: National Institute for Occupational Safety
  - OSHA: Occupational Safety & Health
  - TLV: Threshold Limit Value
  - PEL: Permissible Exposure Limit
  - REL: Recommended Exposure Limit
  - Flam. Liq. 2: Flammable liquids – Category 2
  - Skin Irrit. 2: Skin corrosion/irritation – Category 2
  - STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
  - Asp. Tox. 1: Aspiration hazard – Category 1