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

· Product identifier
  · Trade name: Octafluoronaphthalene (5 fg/µL)
  · Part number: 1R76310-0105
  · 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: (800) 424-9300
    Outside US: (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

· 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**


If SWALLOWED: Immediately call a POISON CENTER/doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Specific treatment (see on this label).

If INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. If skin irritation occurs: Get medical advice/attention. Do NOT induce vomiting.

In case of fire: Use for extinction: CO2, powder or water spray. Take off contaminated clothing and wash it before reuse. Store locked up. Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. 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:**

<table>
<thead>
<tr>
<th>Substance ID</th>
<th>Substance Name</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>540-84-1</td>
<td>2,2,4-trimethylpentane</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

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

- **Description of first aid measures**
- **General information:** Immediately remove any clothing soiled by the product.
- **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.
  Ensure adequate ventilation.
- **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**
  Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.

- **Information about protection against explosions and fires:**
  - Keep ignition sources away - Do not smoke.
  - Protect against electrostatic charges.

- **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.

## 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:**

<table>
<thead>
<tr>
<th>Component</th>
<th>PEL Long-term value</th>
<th>TLV Long-term value</th>
</tr>
</thead>
<tbody>
<tr>
<td>540-84-1 2,2,4-trimethylpentane</td>
<td>2350 mg/m³, 500 ppm</td>
<td>1401 mg/m³, 300 ppm</td>
</tr>
<tr>
<td>n-Octane only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **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:**
  - In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- **Protection of hands:**

  🧲 Protective gloves

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
  Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of 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.
Trade name: Octafluoronaphthalene (5 fg/µL)

- 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:** Nearly odorless
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.

- **Change in condition**
  - Melting point/Melting range: -107 °C (-161 °F)
  - Boiling point/Boiling range: 99 °C (210 °F)

- **Flash point:** -12 °C (10 °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 (31 mm Hg)

- **Density at 20 °C (68 °F):** 0.692 g/cm³ (5.775 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: 100.0 %
    - 1000 g/l / 8.35 lb/gl
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**:
    | 540-84-1 2,2,4-trimethylpentane |
    | Oral LD50 | >5000 mg/kg (rat) |
    | Dermal LD50 | >2000 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.
Trade name: Octafluoronaphthalene (5 fg/µL)

- 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.
- 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 mixture
  - IMDG OCTANES mixture, MARINE POLLUTANT
  - IATA OCTANES mixture
- Transport hazard class(es)
  - DOT
    - Class 3 Flammable liquids
    - Label 3
  - IMDG
    - Class 3 Flammable liquids
    - Label 3

(Contd. of page 6)

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### 44.2.6

- **IATA**

- **Class**
- 3 Flammable liquids

- **Label**
- 3

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

- **DOT, IMDG, IATA**
- II

- **Environmental hazards:**
  - Product contains environmentally hazardous substances: 2,2,4-trimethylpentane
  - Symbol (fish and tree)

- **Marine pollutant:**
  - Warning: Flammable liquids

- **Special precautions for user**
  - 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
    - Code: E2
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 500 ml

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

### 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
    - **Proposition 65**
      - **Chemicals known to cause cancer:**
      - None of the ingredients is listed.
Safety Data Sheet
acc. to OSHA HCS

Printing date 04/27/2017 Reviewed on 04/27/2017
Version Number 1

Trade name: Octafluoronaphthalene (5 fg/µL)

- **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.

- **Carcinogenic categories**
  - **EPA (Environmental Protection Agency)**
    - 540-84-1 2,2,4-trimethylpentane II
  - **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**
  - 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.
  - Use explosion-proof electrical/ventilating/lighting/equipment.
  - Avoid breathing dust/fume/gas/mist/vapors/spray.
  - Wear protective gloves/protective clothing/eye protection/face protection.
  - Ground/bond container and receiving equipment.
  - Use only non-sparking tools.
  - Take precautionary measures against static discharge.
  - Wash thoroughly after handling.
  - Use only outdoors or in a well-ventilated area.
  - IF SWALLOWED: Immediately call a POISON CENTER/doctor.
  - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - Specific treatment (see on this label).
  - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  - Call a POISON CENTER/doctor if you feel unwell.
  - If skin irritation occurs: Get medical advice/attention.
  - Do NOT induce vomiting.
  - In case of fire: Use for extinction: CO2, powder or water spray.
  - Take off contaminated clothing and wash it before reuse.
  - Store locked up.
  - Store in a well-ventilated place. Keep container tightly closed.

(Contd. on page 10)
Store in a well-ventilated place. Keep cool.
Dispose of contents/container in accordance with local/regional/national/international regulations.

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

### 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.

- **Department issuing SDS:** Document Control / Regulatory
- **Contact:** regulatory@ultrasci.com
- **Date of preparation / last revision** 04/27/2017 / -
- **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