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

1.1. Product identifier
Product Identity: Ultra Fast Oxygen Sensor
Alternate Names: UFO130 series, UFO130-2 series

1.2. Relevant identified uses of the substance or mixture and uses advised against
Intended use: See Technical Data Sheet.
Application Method: See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet
Company Name: Teledyne Instruments/Analytical Instruments
16830 Chestnut Street
Industry, CA 91748. USA

Emergency
CHEMTREC (USA): (800) 424-9300
Customer Service: Teledyne Instruments/Analytical Instruments:
626-934-1500
Technical Support: 626-934-1673
Environment, Health and Safety: 626-934-1592

2. Hazard identification of the product

2.1. Classification of the substance or mixture
Skin Corr. 1A;H314: Causes severe skin burns and eye damage.
Eye Dam. 1;H318: Causes serious eye damage.
Carc. 1A;H350: May cause cancer.
Aquatic Acute 1;H400: Very toxic to aquatic life.

2.2. Label elements
Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H350 May cause cancer.
H400 Very toxic to aquatic life.
[Prevention]:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist / vapors / spray.
P262 Do not get in eyes, on skin, or on clothing.
P264 Wash thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves / eye protection / face protection.

[Response]:
P301+310 IF SWALLOWED: Immediately call a POISON CENTER or doctor / physician.
P303+361+353 IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.
P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P308+313 IF exposed or concerned: Get medical advice / attention.
P310 Immediately call a POISON CENTER or doctor / physician.
P331 Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.

[Storage]:
P405 Store locked up.

[Disposal]:
P501 Dispose of contents / container in accordance with local / national regulations.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

<table>
<thead>
<tr>
<th>Ingredient/Chemical Designations</th>
<th>Weight %</th>
<th>GHS Classification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Compounds (as Pb)</td>
<td>50 - 75</td>
<td>Carc. 1A;H350; Aquatic Acute 1;H400</td>
<td>[1][2]</td>
</tr>
<tr>
<td>CAS Number: 0007439-92-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide.</td>
<td>1.0 - 10</td>
<td>Acute Tox. 4;H302; Skin Corr. 1A;H314</td>
<td>[1][2]</td>
</tr>
<tr>
<td>CAS Number: 0001310-58-3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1] Substance classified with a health or environmental hazard.

*The full texts of the phrases are shown in Section 16.*
4. First aid measures

4.1. Description of first aid measures

**General**
In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

**Inhalation**
Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

**Eyes**
Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.

**Skin**
Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.

**Ingestion**
Do NOT induce vomiting. Rinse mouth and slowly drink several glasses of water. Call a physician. Do NOT give anything by mouth to an unconscious or convulsing person.

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

**Overview**

**Routes of Entry:**
- **Inhalation:** Highly unlikely.
- **Ingestion:** May be fatal if swallowed.
- **Skin:** The electrolyte (potassium hydroxide) is corrosive; skin contact may cause irritation or severe chemical burns.
- **Eyes:** The electrolyte (potassium hydroxide) is corrosive; eye contact may cause irritation or severe chemicals burns.

**Acute Effects:** The electrolyte is harmful if swallowed, inhaled or absorbed through the skin. It is extremely destructive to tissue of the mucous membranes, stomach, mouth, upper respiratory tract, eyes and skin.

**Signs and Symptoms of Exposure:** Contact of electrolyte with skin or eyes will cause a burning sensation and/or feel soapy or slippery to touch. Other symptoms of exposure to lead include loss of sleep, loss of appetite, metallic taste and fatigue. For additional exposure information refer to 29 CFR 1910.1025, Appendix A - Substance Data Sheet for Occupational Exposure to Lead.

Possible cancer hazard. Contains an ingredient which may cause cancer based on animal data (See Section 3 and Section 15 for each ingredient). Risk of cancer depends on duration and level of exposure. See section 2 for further details.

**Eyes**
Causes serious eye damage.

**Skin**
Causes severe skin burns and eye damage.

**Chronic effects**

**Chronic Effects:** Prolonged exposure with the electrolyte has a destructive effect on tissue.

Chronic exposure to lead may cause disease of blood and blood forming organs, kidneys and liver, damage to the reproductive systems and decrease in fertility in men and women, and damage to the fetus of a pregnant woman. Chronic exposure from the lead contained in this product is extremely unlikely.

**Carcinogenicity:** Lead is classified by the IARC as a class 2B carcinogen (possibly carcinogenic to humans).

**OSHA:** Where airborne lead exposures exceed the OSHA action level, refer to OSHA Lead Standard 1910.1025.
**Safety Data Sheet**

**Ultra-Fast Oxygen Sensor**

SDS Revision Date: 10/05/2016

**NTP:** NA

**Medical Conditions Generally Aggravated by Exposure:** Lead exposure may aggravate disease of the blood and blood forming organs, hypertension, kidneys, nervous and possibly reproductive systems. Those with preexisting skin disorders or eye problems may be more susceptible to the effects of the electrolyte.

5. **Fire-fighting measures**

5.1. **Extinguishing media**

Use standard fire fighting media on surrounding materials including water spray, foam, and carbon dioxide. (Do not use dry chemical extinguisher containing ammonium compounds.)

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

Hazardous decomposition: Toxic fumes.  
Do not breathe mist / vapors / spray.  
Do not get in eyes, on skin, or on clothing.

5.3. **Advice for fire-fighters**

Wear NIOSH/OSHA approved self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Sealed containers may develop explosive pressures under fire conditions. Use water to cool containers exposed to fire.

**ERG Guide No.** ----

6. **Accidental release measures**

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

Put on appropriate personal protective equipment (see section 8).

6.2. **Environmental precautions**

Do not allow spills to enter drains or waterways.  
Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

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

Wipe down the area several times with a wet paper towel. Use a fresh towel each time. Contaminated paper towels are considered hazardous waste.
7. Handling and storage

7.1. Precautions for safe handling

Note: The oxygen sensors are sealed and under normal circumstances the contents of the sensors do not present a health hazard. The following information is given as a guide in the event that a cell leaks.

Protective measures during cell replacement:
Before opening the bag containing the sensor cell, check the sensor cell for leakage. If the sensor cell leaks, do not open the bag. If there is liquid around the cell while in the instrument, put on gloves and eye protection before removing the sensor cell.

See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities

Containers should be stored in a cool, dry, well-ventilated area. Exercise due caution to prevent damage to or leakage from the container. Keep containers closed when not in use.

Incompatible materials: Aluminum, organic materials, acid chlorides, acid anhydrides, magnesium, copper. Avoid contact with acids and hydrogen peroxide >52%.

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

No data available.

8. Exposure controls and personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Ingredient</th>
<th>Source</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001310-58-3</td>
<td>Potassium hydroxide.</td>
<td>OSHA</td>
<td>No Established Limit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACGIH</td>
<td>Ceiling: 2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH</td>
<td>C 2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supplier</td>
<td>No Established Limit</td>
</tr>
<tr>
<td>0007439-92-1</td>
<td>Lead Compounds (as Pb)</td>
<td>OSHA</td>
<td>[1910.1025] TWA 0.050 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACGIH</td>
<td>TWA: 0.05 mg/m³R, 2B, 2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH</td>
<td>TWA (8-hour) 0.050 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supplier</td>
<td>No Established Limit</td>
</tr>
</tbody>
</table>

Carcinogen Data

| CAS No.      | Ingredient                  | Source    | Value                                                                 |
|--------------|-----------------------------|-----------|                                                                      |
| 0001310-58-3 | Potassium hydroxide.        | OSHA      | Select Carcinogen: No                                               |
|              |                             | NTP       | Known: No; Suspected: No                                            |
|              |                             | IARC      | Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No; |
| 0007439-92-1 | Lead Compounds (as Pb)      | OSHA      | Select Carcinogen: Yes                                              |
|              |                             | NTP       | Known: No; Suspected: Yes                                            |
|              |                             | IARC      | Group 1: No; Group 2a: No; Group 2b: Yes; Group 3: No; Group 4: No; |
8.2. Exposure controls

Respiratory  If workers are exposed to concentrations above the exposure limit they must use the appropriate, certified respirators.

Eyes  Chemical splash goggles.

Skin  Apron, face shield Wear gloves. Gloves must be resistant to corrosive materials. Nitrile or PVC gloves are suitable. Do not use cotton or leather gloves.

Engineering Controls  Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.

Other Work Practices  Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Article - Solid</td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not Measured</td>
</tr>
<tr>
<td>pH</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>&gt;328 C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>&gt;1320 C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Evaporation rate (Ether = 1)</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Lower Explosive Limit: Not Measured</td>
</tr>
<tr>
<td></td>
<td>Upper Explosive Limit: Not Measured</td>
</tr>
<tr>
<td>Vapor pressure (Pa)</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/water (Log Kow)</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Viscosity (cSt)</td>
<td>Not Measured</td>
</tr>
</tbody>
</table>

9.2. Other information

No other relevant information.
10. Stability and reactivity

10.1. Reactivity
Hazardous Polymerization will not occur.

10.2. Chemical stability
Stable under normal circumstances.

10.3. Possibility of hazardous reactions
Incompatible with strong oxidizers, leather and halogenated compounds. Product will react with 'soft' metals such as aluminum, tin, magnesium, and zinc releasing flammable hydrogen gas.

10.4. Conditions to avoid
Excessive heat and open flame.

10.5. Incompatible materials
Aluminum, organic materials, acid chlorides, acid anhydrides, magnesium, copper. Avoid contact with acids and hydrogen peroxide >52%.

10.6. Hazardous decomposition products
Toxic fumes.

11. Toxicological information

Acute toxicity

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Oral LD50, mg/kg</th>
<th>Skin LD50, mg/kg</th>
<th>Inhalation Vapor LD50, mg/L/4hr</th>
<th>Inhalation Dust/Mist LD50, mg/L/4hr</th>
<th>Inhalation Gas LD50, ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Compounds (as Pb) - (7439-92-1)</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Potassium hydroxide. - (1310-58-3)</td>
<td>365.00, Rat - Category: 4</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

<table>
<thead>
<tr>
<th>Classification</th>
<th>Category</th>
<th>Hazard Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (oral)</td>
<td>---</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Acute toxicity (dermal)</td>
<td>---</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Acute toxicity (inhalation)</td>
<td>---</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>1A</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>1</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>---</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>---</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>---</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
12. Ecological information

12.1. Toxicity
Very toxic to aquatic life.

Aquatic Ecotoxicity

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>96 hr LC50 fish, mg/l</th>
<th>48 hr EC50 crustacea, mg/l</th>
<th>ErC50 algae, mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Compounds (as Pb) - (7439-92-1)</td>
<td>0.44, Cyprinus carpio</td>
<td>4.40, Daphnia magna</td>
<td>0.25 (72 hr), Scenedesmus subspicatus</td>
</tr>
<tr>
<td>Potassium hydroxide. - (1310-58-3)</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability
There is no data available on the preparation itself.

12.3. Bioaccumulative potential
Not Measured

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects
Lead is bioaccumulative in most aquatic life and mammals. It is highly mobile as lead dust or fume, yet forms complexes with organic material which limits its mobility.

13. Disposal considerations

13.1. Waste treatment methods
Do not allow into drains or water courses. Wastes and emptied containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act.

Using information provided in this data sheet advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply.
14. Transport information

DOT:
UN3266, Corrosive liquid, basic, inorganic, n.o.s., (potassium hydroxide, lead), 8, II
NOTE: This description is used for shipping purposes when not using Teledyne’s US DOT Approval.

UN3363, Dangerous Goods in Machinery or Dangerous Goods in Apparatus, 9.
NOTE: This description is used when shipping under the US DOT Approval.

IATA: Regulated. Refer to IATA Dangerous Goods in Excepted Quantities Sec. 2.7.

Environmental hazards
IMDG
Marine Pollutant: Yes (Lead Compounds (as Pb))

15. Regulatory information

Regulatory Overview
The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

Toxic Substance Control Act (TSCA)
All components of this material are either listed or exempt from listing on the TSCA Inventory.

WHMIS Classification
D2A E

US EPA Tier II Hazards
Fire: No
Sudden Release of Pressure: No
Reactive: No
Immediate (Acute): Yes
Delayed (Chronic): Yes

EPCRA 311/312 Chemicals and RQs (lbs):
Lead Compounds (as Pb)  (10.00)
Potassium hydroxide  (1,000.00)

EPCRA 302 Extremely Hazardous:
(No Product Ingredients Listed)

EPCRA 313 Toxic Chemicals:
Lead Compounds (as Pb)

Proposition 65 - Carcinogens (>0.0%):
Lead Compounds (as Pb)

Proposition 65 - Developmental Toxins (>0.0%):
Lead Compounds (as Pb)

Proposition 65 - Female Repro Toxins (>0.0%):
Lead Compounds (as Pb)
Proposition 65 - Male Repro Toxins (>0.0%):
   Lead Compounds (as Pb)

N.J. RTK Substances (>1%):
   Lead Compounds (as Pb)
   Potassium hydroxide.

Penn RTK Substances (>1%):
   Lead Compounds (as Pb)
   Potassium hydroxide.

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:
   H302 Harmful if swallowed.
   H314 Causes severe skin burns and eye damage.
   H350 May cause cancer.
   H400 Very toxic to aquatic life.

This is the first version in the GHS SDS format. Listings of changes from previous versions in other formats are not applicable.

All chemicals may pose unknown hazards and should be used with caution. While the information contained in this Material Safety Data Sheet is believed to be correct and is offered for your information, consideration and investigation, Teledyne Analytical Instruments assumes no responsibility of the completeness or accuracy of the information contained herein.

End of Document