Material Safety Data Sheet

Section I – Product Identification

Product Name:	Oxygen Sensor Micro-Fuel Cells and Super Cells, all classes except A-2C, A-3, and A-5. Electrochemical Oxygen Sensors, all classes except R-19. Mini-Micro-Fuel Cells, all classes.
Manufacturer:	Teledyne Instruments/Analytical Instruments
Address:	16830 Chestnut Street, City of Industry, CA 91748
Phone:	(626) 961-9221
Technical Support:	(626) 934-1673
Environment, Health and Safety:	(626) 934-1592
Date Prepared:	10/19/99
Revision Date:	6/7/05

Section II – Hazardous Ingredients/Composition

Material or Component	C.A.S. #	Quantity	OSHA PEL	ACGIH
Lead (Pb)	7439-92-1	5-20 gms	0.05 mg/m^3	0.15 mg/m^3
Potassium hydroxide (KOH)	1310-58-3	1-5 ml (10% - 15% KOH in water)	2mg/m^3 (ceil)	2mg/m^3 (ceil)

Section III – Health Hazard Data

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.

Chronic Effects:

Prolonged exposure with the electrolyte has a destructive effect on tissue.

Chronic exposure to lead may cause disease of the 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.

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.
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.
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.

Section IV – Emergency First Aid Procedures

In case of contact with the skin or eyes, immediately flush with plenty of water for at least 15 minutes and remove all contaminated clothing. Get medical attention immediately.

If ingested, give large amounts of water and DO NOT INDUCE VOMITING. Obtain medical attention immediately.

If inhaled, remove to fresh air and obtain medical attention immediately.

Section V – Fire and Explosion Hazard Data

Flash Point: NA **Flammable Limits:** NA **LEL:** NA **UEL:** NA

Extinguishing Media:	Use extinguishing media appropriate to surrounding fire conditions. No specific agents recommended.
Special Fire Fighting Equipment:	Wear NIOSH/OSHA approved self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Unusual Fire and Explosion Hazards:	Not applicable.

Section VI – Cleanup Procedures

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

Section VII – Precautions for Safe Handling and Use

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, wear eye and hand protection.

Section VIII – Exposure Controls/Personal Protection

Eye Protection: Chemical splash goggles

Hand Protection: Rubber gloves

Other Protective Clothing: Apron, face shield

Ventilation: NA

Section IX – Physical/Chemical Characteristics

Material or Component	Boiling Point (°C)	Specific Gravity	Vapor Pressure	Melting Point (°C)	Density	Evap. Rate	Solubility in Water	Odor/Appearance Physical State
Lead	1744	11.34	NA	328	NA	NA	Insoluble	Solid, silver gray, odorless
Potassium hydroxide	1320	2.04	NA	360	NA	NA	Complete	White or slightly yellow. No odor

Section X – Stability and Reactivity

Stability: Stable

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

Hazardous Decomposition: Toxic fumes

Hazardous Polymerization: Will not occur.

Section XI – Toxicological Information

Toxicity to Animals: Acute oral toxicity (LD50): 2730 mg/kg (Rat) (Calculated value for the KOH solution.)

Mutagenicity: Lead tested positive as a mutagen in the Ames test.

Section XII – Ecological Information

Ecotoxicity: The LC50 of lead for the daphnia magna is 3.6 mg/l, and 5.1 mg/l for the daphnia pulex.

Environmental Fate: 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.

Section XIII – Disposal Considerations

Waste must be disposed of in accordance with Federal, State and Local environmental control regulations. If discarded in its purchased form, this product is hazardous by its characteristics of toxicity and corrosivity under RCRA.

EPA Waste Number: D008, D002

DOT Information: Corrosive liquid, basic, inorganic, n.o.s. (potassium hydroxide, lead), 8, UN 3266, II.

Follow all Federal, State and Local regulations.

Section XIV – Transport Information

DOT: Regulated. Refer to Small Quantity Exceptions: 49 CFR 173.4

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

Section XV – Regulatory Information

US Federal Regulations

1) OSHA – Hazardous by definition of Haz Com Std. 29 CFR 1910.1200

2) SARA TITLE III

- Sec 302 (40 CFR Part 355)

Chemical Name	CAS #	%	TPQ lbs	RQ
None	NA	NA	NA	NA

- Sec 311 & 312

Chemical Name	Acute Health Haz	Chronic Health Haz	Fire Hazard	Sudden Release of Pressure Haz	Reactive
Lead	Yes	Yes	No	No	No
Potassium hydroxide	Yes	Yes	No	No	No

- Sec 313 (40 CFR Part 372): This product contains the following toxic chemicals subject to the reporting requirements of Section 313, of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical Name	CAS #	Lead Content
Lead	7439-92-1	5-20 gms

3) TSCA (Toxic Substances Control Act)

Components of this product are listed on the TSCA inventory.

4) CERCLA Section 102(A) (40 CFR Part 302) – Hazardous Substances and Reportable Quantities

Chemical Name	CAS #	RQ
Lead *	7439-92-1	10 lbs.
Potassium hydroxide (solid)	1310-58-3	1,000 lbs.

* No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 100 micrometers (0.004 inches).

State Regulations

California Proposition 65: WARNING: This product contains lead, a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Massachusetts: Potassium hydroxide is a listed chemical.

Pennsylvania: Potassium hydroxide is a listed chemical.

International Regulations

Canada: Canadian Environmental Protection Act (CEPA): Potassium hydroxide, liquid, is on the Domestic Substances List (DSL) and is acceptable for use under the provisions of CEPA.

WHMIS: Potassium hydroxide (liquid)

Class D-2A: Material causing other toxic effects (VERY TOXIC)
Class E: Corrosive liquid.

Lead

Class D-2A

EEC: Potassium hydroxide (liquid)

R35 – Causes severe burns.
R42 – May cause sensitization by inhalation.
R36/37/38 – Irritating to eyes, respiratory system and skin.

Section XVI – Other Information

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 for the completeness or accuracy of the information contained herein.