10 Material Safety Data Sheet

I. Product Identification

Product Name: Oxygen Sensor (Series XLT, Private Label derivations)

Manufacturer: Analytical Industries Inc.
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II. Hazardous Ingredients / Composition

Material	C.A.S. #	Quantity	OSHA PEL	ACGIH
Lead (Pb)	7439-92-1	5-10 gms	0.03 mg/m^3	0.15 mg/m^3
Acetic Acid, Glacial*	64-19-7	1-3 ml	TWA 10 ppm	TLV 10 ppm; STEL 15 ppm
*Data pertains to concentrations >80%, actual solution >10% but not >80%				
Lead Acetate, Trihydrate	6080-56-4	< 1 ml	0.05 mg(Pb)/m^3	0.15 mg(Pb)/m^3
Potassium Acetate	127-08-2	< 1 ml	NA	NA

III. Health Hazard Data

		Lead (Pb) - Anode	Acetic Acid	Lead Acetate (Electrolyte)	Potassium Acetate
Routes of Entry:	Inhalation:	Very unlikely.	Very unlikely (liquid electrolyte).		
	Ingestion:	May be harmful or fatal if swallowed.	May be harmful or fatal if swallowed.		
	Skin:	NA	Contact may cause irritation or chemical burns.		
	Eyes:	NA	Contact may cause irritation or chemical burns.		
Acute Effects:		NA	Corrosive, harmful if swallowed, inhaled or absorbed through the skin. Headache, nausea, vomiting, dizziness, gastrointestinal irritation.		
Chronic Effects:		Very unlikely due to product content. May cause disease of blood and blood organs, kidneys, liver, a decrease in fertility, damage to the reproductive system and damage to the fetus of a pregnant woman.	Anemia, kidney damage, blurred vision, lead build-up in the central nervous system.		
Symptoms of Exposure:		Loss of sleep and appetite, metallic taste and fatigue. For detail information refer to 29 CFR 1910.1025, Appendix A	Tightness and pain in the chest, coughing, difficult breathing. Slippery to touch, burning sensation to skin and eyes.		

Carcinogenicity:	IARC class 2B (lead is possibly carcinogenic to to human beings)	None identified.	IARC animal carcinogen.	None identified.
OSHA:	If airborne exposure exceeds action level refer to OSHA Lead Standard 1910.1025	NA	NA	NA
NTP:	NA	NA	NA	NA
Medical Conditions Generally Aggravated by Exposure:	Disease of the blood and blood forming organs, hypertension, kidneys, nervous and possibly reproductive systems.	Diseases of respiratory system and skin.	None identified.	None identified.

IV. Emergency First Aid Procedures

	Lead (Pb) - Anode	Acetic Acid	Lead Acetate (Electrolyte)	Potassium Acetate
Following any event:	NA	Obtain medical attention immediately.		
Skin or eye contact:		Immediately flush with generous amounts of water. Continue flushing with water for 15 minutes. Remove all contaminated clothing.		
Ingestion:		Drink generous amounts of water. DO NOT INDUCE VOMITING.		
Inhalation:		Relocate to source of clean ambient air.		

V. Fire and Explosion Hazard Data

Material	Lead (Pb) - Anode	Acetic Acid	Lead Acetate (Electrolyte)	Potassium Acetate
Flash Point	NA		NA	
Flammable Limits	NA		NA	
LEL	NA		NA	
UEL	NA		NA	
Unusual Fire / Explosion Hazards	NA		NA	
Extinguishing Media:	NA	No specific agents recommended, use media appropriate to fire conditions.		
Special Equipment:	NIOSH / OSHA approved self-contained breathing apparatus, protective clothing to prevent contact with skin and eyes.			

VI. Cleanup Procedures

Saturate a paper towel with tap water and wipe down the area.
Repeat several times with a new paper towel.
Used or contaminated paper towels are considered hazardous waste, refer to section XIII. Disposal Considerations.

VII. Precautions for Safe Handling and Use

Attention: Under normal circumstances the lead anode and potassium hydroxide electrolyte are sealed inside the oxygen sensor which is then\ sealed in a polyethylene bag and placed in a cardboard box for shipment) and do not present a health hazard. The following guidelines are provided in the event an oxygen sensor leaks electrolyte.

Protective Measures: Before installing (initially or replacement) a new oxygen sensor, open the cardboard box and check for electrolyte leakage inside the polyethylene bag. Some bags are clear and easily inspected,

Other bags are not clear and like sensor housings inside analyzers must be opened to be inspected. A clear liquid inside the clear polyethylene bag indicates an electrolyte leak, do not open the bag.

Anytime the oxygen sensor is not readily visible always open slowly and visually inspect for evidence o a clear liquid indicating an electrolyte leak.

Refer to section VIII. Personal Protection recommendations for hand, skin and eye protection when handling oxygen sensors that have leaked electrolyte.

VIII. Personal Protection Exposure Controls

Eye Protection:	Chemical splash goggles.
Hand Protection:	Rubber or latex gloves.
Other Protective Clothing:	Apron, face shield.
Ventilation:	NA

IX. Physical / Chemical Characteristics

Material / Component:	Lead (Pb) - Anode	Acetic Acid	Lead Acetate (Electrolyte)	Potassium Acetate
Boiling Point (°C):	1744		NA	
Specific Gravity:	11.34		1.01	
Vapor Pressure:	NA		NA	
Melting Point (°C):	328		NA	
Density:	NA		NA	
Evaporation Rate:	NA		NA	
Solubility in Water:	Insoluble		Complete	
Odor / Physical Appearance:	Odorless, solid, silver gray		Vinegar like odor, clear liquid.	

X. Stability and Reactivity

Material / Component:	Lead (Pb) - Anode	Acetic Acid	Lead Acetate (Electrolyte)	Potassium Acetate
Stability:	Stable		Stable	
Incompatibilities:	NA		Bases, oxidizing agents, non-precious metals, copper.	
Hazardous Decomposition:	NA		Toxic fumes.	
Hazardous Polymerization:	NA		Will not occur.	

XI. Toxicological Information

	Lead (Pb) - Anode	Acetic Acid	Lead Acetate	Potassium Acetate
Toxicity to Animals:	Acute oral toxicity LD50	Acute oral toxicity LD50: 2730 mg/kg (Rat).		
Mutagenicity:	Tested positive as a mutagen in Ames test.		NA	

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 dust or fumes (30 mesh is the smallest particle size found inside the oxygen sensor), yet forms complexes with organic material which limits its mobility.

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.

Material / Component:	Lead (Pb) - Anode	Acetic Acid	Lead Acetate (Electrolyte)	Potassium Acetate
EPA Waste Number:	D008	D002	U144	NA

DOT Information: Corrosive liquid, acidic, inorganic, n.o.s. (lead, acetic acid), 8, UN 3266, II.
Follow all Federal, State and Local regulations.

XIV. Transport Information

DOT: Regulated. Meets criteria for Small Quantity Exceptions of 49 CFR 173.4

IATA: Regulated. Meets criteria for IATA Dangerous Goods in Excepted Quantities, Section 2.7

XV. Regulatory Information

U.S. Federal Regulations

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

2) SARA TITLE III

Sec 302 (40 CFR Part 365): **Not Applicable** as to chemical name, CAS#, %, TPQ lbs., RQ

Sec 311 & 312: **YES** as to Acute and Chronic Health Hazard;
NO as to Fire and Sudden Release of Pressure Hazard, Reactive

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	5-25 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.

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:

Chemical Name	Class
Acetic Acid, Lead Acetate	D-2A: Material causing other VERY TOXIC effects E: Corrosive liquid
Lead	D-2A: Material causing other VERY TOXIC effects

European Community:

Acetic Acid, Lead Acetate (liquid):
R10-35 - Causes severe burns.
R42 - May cause sensitization by inhalation.
R36/37/38 - Irritating to eyes, respiratory system and skin.

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, Analytical Industries Inc. assumes n responsibility for the completeness or accuracy of the information contained herein.