

# Material Safety Data Sheet

## Electrochemical Oxygen Sensor

### SECTION I - MANUFACTURER AND CONTACT INFORMATION

Supplier: RAE Systems Inc.  
 Address: 3775 North First Street  
 San Jose, CA 95134 USA

Telephone Number: 408-952-8200  
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### SECTION II - HAZARDOUS COMPONENTS

<u>Component</u>	<u>Formula</u>	<u>CAS No.</u>
a. Potassium acetate, 4 M aqueous solution	CH <sub>3</sub> CO <sub>2</sub> K	127-08-2
b. Lead metal (<16 g)	Pb	7439-92-1
c. Lead (II) Oxide	PbO	1317-36-8
d. Lead (IV) Oxide	PbO <sub>2</sub>	1309-60-0
e. Antimony metal (<0.5%; <80 mg)	Sb	7440-36-0
f. Platinum black	Pt	7440-06-4
g. Graphite (Carbon)	C	7782-42-5

### SECTION III - PHYSICAL & CHEMICAL PROPERTIES

<u>Component:</u>	<u>CH<sub>3</sub>CO<sub>2</sub>K</u>	<u>Pb</u>	<u>PbO</u>	<u>PbO<sub>2</sub></u>	<u>Sb</u>	<u>Pt</u>	<u>C</u>
<u>Description:</u>	White crystalline solid	Gray wire wool	Yell./orange powder or crystalline scales	Dark brown or black powder	Gray powder	Black powder	Soft black scales
<u>Melting Point:</u>	292 °C	327 °C	888 °C	decomposes	631 °C	1772 °C	n/a
<u>Boiling Point:</u>	n/a	1740 °C	n/a	n/a	1587 °C	3827 °C	n/a
<u>Vapor Press.:</u>	n/a	1.8 mm Hg @ 1000 °C	n/a	n/a	1 mm Hg @ 886 °C	n/a	n/a
<u>Vapor Density:</u>	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<u>Evapor. Rate:</u>	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<u>Density:</u>	1.57 g/cc	11.3 g/cc	n/a	9.38 g/cc	6.69 g/cc	21.5 g/cc	2.25 g/cc
<u>Water solubil:</u>	2.53 g/cc	insoluble	0.002 g/cc	insoluble	insoluble	n/a	insoluble

### SECTION IV - FIRE AND EXPLOSION HAZARDS

Potassium acetate and graphite are combustible after drying (along with some of the non-hazardous components such as the plastic casing). All metal and metal oxide components are non-combustible. The lead dioxide, a minor component, is capable of igniting combustible material when heated. Platinum black and antimony, when dispersed, may promote the oxidation and ignition of flammable liquids and vapors. Some components, particularly the lead oxides, may evolve toxic fumes in a fire. Applying a potential to the cell may cause it to heat and rupture.

FIRE FIGHTING MEASURES - Water spray, foam, dry powder, or carbon dioxide.

### SECTION V - REACTIVITY

STABILITY: The potassium acetate solution is corrosive. All components are stable under ambient conditions. Very high and very low humidity will dilute or dry out the electrolyte, respectively.

CONDITIONS TO AVOID: Avoid heat sources and do not apply a potential to the cell.

INCOMPATIBILITIES: Avoid contact with oxidizing agents such as nitrates and halogens.

HAZARDOUS POLYMERIZATION: Will not occur.

## SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: INHALATION? No. SKIN? Yes. INGESTION? Yes.

HEALTH HAZARDS (Acute & Chronic):

Potassium Acetate: May irritate skin on prolonged contact. Irritating to eyes and if inhaled as dust. If ingested in quantity, may cause vomiting and diarrhea.

Lead Compounds: Harmful if ingested or inhaled as dust. Major hazard is due to cumulative effects of lead. Symptoms include digestive disturbances, pallor, anemia, blue line on gums.

Antimony: Causes dermatitis, keratitis, conjunctivitis and nasal ulceration by contact as fumes or dust. Harmful if ingested.

Carbon & Platinum: May be harmful if ingested in quantity. Irritating to eyes and respiratory system if inhaled as dust. Carbon may cause allergic reactions.

<u>Component</u>	<u>CH<sub>3</sub>CO<sub>2</sub>K</u>	<u>Pb</u>	<u>PbO</u>	<u>PbO<sub>2</sub></u>	<u>Sb</u>	<u>Pt</u>	<u>C</u>
U.S. 8-hr TWA	n/a	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>
Acute Toxicity	LD50 3250 mg/kg oral, rat	See effects noted above	See effects noted above	See effects noted above	LD50 7000 mg/kg oral, rat	LDLO5250 mg/kg implant, rat	No data
Mutagen/Teratogen	No	Possible	Yes	Possible	No	No	No
Carcinogen	No	Yes-animal	Yes-animal	Yes-animal	Yes-animal	No	No

## FIRST AID PROCEDURES

Skin & Eyes: Wash thoroughly with water, and in severe cases seek medical attention.

Ingestion: Give plenty of water to drink. Seek medical attention.

Inhalation: Remove from exposure, rest and keep warm. Seek medical attention.

## SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

During normal operation, users are not exposed to the hazardous components. The potential for hazardous exposure exists after physical damage to the cell, such as may be caused by crushing, piercing, or electrical misuse. In such cases the primary hazard results from the corrosive nature of the potassium acetate electrolyte. Secondary toxic or mutagenic effects may result from exposure to the inorganic components or the electrolyte, mostly if ingested. If dried and broken, dust may be inhaled.

## LEAK & DISPOSAL PROCEDURES

Contain any large leaks using a plastic vessel. Dilute and wash with plenty of water or soapy water. Dispose of washings and/or sensor according to local regulations regarding hazardous waste.

## SECTION VIII - CONTROL MEASURES

Avoid skin contact through use of personal protective equipment. Avoid Inhalation or ingestion.

<u>Respirator</u>	<u>Ventilation</u>	<u>Gloves</u>	<u>Eye Protection</u>	<u>Other Measures</u>
Dust respirator	Hood	Rubber or plastic	Goggles or face shield	Plastic apron & sleeve

Store in a sealed plastic container at 0 °C when not in use to preserve humidity and contain any leaks.

## SECTION IX - FURTHER INFORMATION

For more details contact the manufacturer or supplier for an MSDS of the individual components.