Material Safety Data Sheet
RAE-Sep Benzene and Halocarbon Tubes

SECTION I - MANUFACTURER AND CONTACT INFORMATION

Manufacturer: RAE Systems Inc.
Address: 3775 North First Street
San Jose, CA 95134 USA
Telephone Number: 408-952-8200
FAX Number: 408-952-8480
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SECTION II - HAZARDOUS COMPONENTS

Component	Formula	CAS No.	Amount
a. Proprietary inert matrix (low hazard)	-	-	>80%
b. Sulfuric Acid	H_2SO_4	7664-93-9	<20%
c. Chromium compounds	CrO_x	-	<1% (<5 mg Cr)

SECTION III - PHYSICAL & CHEMICAL PROPERTIES

Component:	Matrix	H_2SO_4	Cr Compounds
Description:	Colorless solid particles	Colorless aqueous solution	Yellow-orange powder
Melting Point:	n/a	n/a	~980 °C
Boiling Point:	n/a	330 °C (100%)	n/a
Vapor Pressure:	n/a	n/a	n/a
Vapor Density:	n/a	n/a	n/a
Evaporation Rate:	n/a	n/a	n/a
Density:	n/a	1.29 g/cc	2.7 g/cc
Water solubility:	insoluble	miscible	v. soluble

SECTION IV - FIRE AND EXPLOSION HAZARDS

All components are non-combustible except the end-plug fibers. Sulfuric acid may evolve heat on dilution of large quantities and evolves toxic fumes in a fire.

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

SECTION V - REACTIVITY

STABILITY: The sulfuric acid and chromium compounds are very corrosive and oxidizing. The tube contents are very hygroscopic but otherwise stable under ambient conditions.
CONDITIONS TO AVOID: Avoid heat sources and do not apply a potential to the cell.
INCOMPATIBILITIES: Bases and reducing agents such as hydrogen sulfide, organic compounds, and ammonia; powdered non-noble metals and metal containers; hydrofluoric acid
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

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

HEALTH HAZARDS (Acute & Chronic):
Sulfuric acid: Strongly corrosive to skin, eyes, and respiratory tract. Exposure symptoms include burning sensation, coughing, wheezing, shortness of breath, nausea, and vomiting.
Chromium Compounds: Strongly corrosive to skin, eyes, and respiratory tract.

Matrix: May be harmful if ingested in large quantity. Irritating to eyes and respiratory system if inhaled as dust. Prolonged inhalation of dust may cause fibrosis of the lung.

Component	Matrix	H_2SO_4	Cr Compounds
ACGIH 8-hr TWA	10 mg/m^3	0.2 mg/m^3	0.05 mg/m^3
Acute Toxicity	Irritation of respiratory tract	LDLO 135 mg/kg UNR -man	See effects noted above
Mutagen/Teratogen	No data	No data	No data
IARC Carcinogen	Inadequate evidence	Yes, as mist	Yes

FIRST AID PROCEDURES
Skin & Eyes: Wash with copious amounts of 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
Wear gloves and eye protection when opening tubes to protect against glass pieces and sharp edges. During normal operation, users are not exposed to the hazardous components. The potential for hazardous exposure exists after the tubes are opened or physically damaged by crushing or breaking. If the tubes are left open for extended periods in highly humid environments, the potential exists for water to be absorbed into the tube and leach sulfuric and chromic acids. In such cases the primary hazard results from the corrosive nature of these acids. Secondary toxic or carcinogenic effects may result from exposure to the inorganic components or the matrix, mostly if ingested. If broken and dried, dust may be inhaled. Under typical ambient conditions the hygroscopicity helps minimize the likelihood of dust formation.

LEAK & DISPOSAL PROCEDURES
Contain any large leaks using a plastic vessel. Cover with lime, sand, or soda ash. Very small leaks may be diluted with plenty of water or - water mixture. Neutralize washings with calcium carbonate or dilute caustic and dispose of them according to local regulations.

SECTION VIII - CONTROL MEASURES
Avoid skin contact through use of personal protective equipment. Avoid Inhalation or ingestion.

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

Store unopened tubes in the protective boxes at 5°C to preserve capacity. Store used tubes in a sealable non-metal container to contain any spills or leaks.

SECTION IX - FURTHER INFORMATION
For more details contact the manufacturer at the address on page 1 for MSDSs of individual components.