AJA Metal Evaporator SOP - SHORT FORM

AJA Thermal Evaporator SOP

Safety Information and Overview

Advanced Science Research Center	Graduate Center CUNY
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SOP Title	AJA Thermal Evaporator SOP
Principal Investigator	Samantha Roberts
Department	NanoFabrication Facility
Room and Building	ASRC G.263

Section 1 – Process or Experiment Description

This SOP is only for the general use of depositing thin films. Only approved users are allowed to use the equipment, after passing a qualification with the tool manager. Any maintenance will be done by trained staff members. Some maintenance creates additional hazards which will be described in the Instrument Manual.

*Note: Any sample preparation is to be done by the user, and this document does not cover any information related to sample preparation. Any materials listed outside of the approved list, must be discussed with the tool manager. NO high vapor pressure materials

Section 2 – Hazardous Substances

Substance Name: Chromium

Common Name: Chrome

Abbreviation: Cr

Substance Name: Silver

Abbreviation: Ag

Section 3 – Potential Hazards

Hazard	Hazard Sign	Hazard Description
Bright light		**Serious eye damage** may occur if viewed directly at light during use
Electric Shock		The tool operates in **extremely high voltages (3-10kV).**
Thermal		Sample(s) and sample plate can get **hot to touch**
Chrome	 	Exposure to particulate or vapor form may present **significant health hazards and is toxic to aquatic organisms.** Under the high temperatures involved in e-beam evaporation, **metallic Cr can oxidize** into Cr(VI), especially in the presence of residual oxygen. **This is highly toxic to aquatic**

		organisms and is a known human carcinogen.
Silver		Silver is toxic to aquatic life in nanoparticulate or ionic forms. **low acute toxicity**, but chronic exposure (especially to nanoparticles or silver dust) may lead to: **Argyria**: A bluish-gray discoloration of the skin. **Respiratory irritation** from dust or vapor in poorly ventilated areas.

Section 4 – Routes of Exposure

Eye damage can occur if looking through the viewport window with the shutter open, and not wearing the appropriate protective eyewear.

Electric shock can occur when working with the high voltage feedthroughs or in the back of the electronics rack, without properly grounding the work area beforehand.

Thermal hazard is present if using the e-beam evaporator for a long period of time, which can heat up the plate and the sample(s).

Inhalation hazard is present if did not wait until the tool has vented fully to the atmosphere.

Section 5 – Personal Protective Equipment

All personnel must wear the welding goggles whenever looking directly at the bright e-beam.

All trained staff must use the grounding rod to touch the working areas, before attempting any maintenance.

Section 6 – Waste Disposal

Kapton or copper tape that has silver and/or chrome on the top layer, must be disposed into the container found on the workbench. Staff will transport the container for waste disposal when the container is full.

Hazardous compound, element, or chemical name	State (L,G,S)	Hazardous	Non-hazardous	Which hazards?	How is waste managed?
Silver	S	x		Solid waste is toxic to environment, aquatic, and human health	Must be collected and disposed of as Hazardous waste
Chrome	S	x		Solid waste is toxic to environment and human health	Must be collected and disposed of as Hazardous waste

Tool operation

Coming soon!

Common Errors and Troubleshooting

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