

Subject:	Photon Sciences Americium-241 Sealed Source User Training (Course Code PS-RAD-AM241)		
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*Approval signatures on file with master copy.

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Instructions

All users of Am-241 sources shall complete this awareness training prior to the first use of source. Training is valid for 2 years. A TLD is required during use of this source.

Read the material below and then close this document. You will receive credit for training through the BNL training system.

Introduction

Researchers at the NSLS use a sealed source that is commonly known as a "Pocket Synchrotron" to generate X-rays of specific energies in order to calibrate detectors. This source consists of a compact assembly containing a sealed ceramic primary 10 millicurie Americium-241 source in a welded stainless steel capsule with integral tungsten alloy rear shielding. The source excites characteristic X-rays from six different targets in turn:

Target Selected	Energy (KeV)		Dose Rate mRad/hr*	Other Am-241 Information
	K α	K β		
Cu	8.04	8.91	7.8	Half-life: 433 years
Rb	13.37	14.97	11	Principal α -energies: 5.442 (12.5%), 5.484 (85.2%)
Mo	17.44	19.63	16	γ --energies: 59.5 keV (35.3%)
Ag	22.10	24.99	15	and others in low abundance
Ba	32.06	36.55	11	X-ray energies: Np L X-rays: 11.9 - 22.2 keV
Tb	44.23	50.65	10	*millirad/hr. dose rate at 1 cm above device

The annular primary source surrounds the X-ray emission aperture in the fixed part of the stainless steel assembly and the targets are mounted on a rotary holder. Each target can be presented to the primary source in turn and the characteristic X-rays from the target are emitted through the 4 mm diameter aperture with a solid angle of ~0.5 steradian. These Am-241 sources are designated as "Accountable" based on activity levels listed in the Code of Federal Regulations (10CFR835) and this training is required by all personnel who use an Am-241 source.

Labeling

Each source's wooden box is labeled with a unique Sealed Radioactive Source Inventory Bar Code number (e.g. 200106) and with a yellow/magenta Radioactive Material label.

Storage and Posting

When not in use, each source has a permanent storage location in a locked cabinet (the source is also packed inside a wooden box and a metal can). The cabinet has a required yellow/magenta posting titled "Caution: Radioactive Material" with a listing of the source(s) in the cabinet, their activities, and the owner or "Source Custodian" for each source.

Obtaining the Source for Use and Returning the Source

Note: A TLD IS REQUIRED DURING USE OF SOURCE

Any person using this source must be fully trained to have unescorted access to the NSLS experimental floor (Facility Specific and GERT), complete this user awareness training, and wear a radiation monitoring

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badge (TLD). To obtain the source, contact the Source Custodian. This person will unlock the cabinet to access the Am-241 source. Fill in the logbook with your name, telephone extension, type, and bar code of the source you are borrowing, the date, and the location at which you will use the source. Obtain the source-specific posting for that accountable source. Take the source box and container to your beamline, being careful to keep the source from excessive movement. Mount the source-specific posting on the hutch door to alert personnel to the presence of the source. When done, return the source and posting to the Source Custodian, and enter the return date in the logbook.

Important Points

- Mount the source-specific posting at the location of use, such as a hutch.
- If you leave the hutch area (for lunch or overnight) with the source inside, lock the hutch door.
- Do not place fingers or other parts of the body (such as an eye) near the source's open aperture.
- Do not disassemble or alter the device in any way other than for its intended purpose.
- Keep the source secure from horizontal and vertical movement and keep the source inside the wooden box during transport.
- If the source is damaged, do not repair it; contact the Source Custodian and a Radiological Control Technician.
- If the source is misplaced and cannot be found, inform the Source Custodian immediately.
- You are not expected to acquire a recordable whole body dose on your radiation badge from handling this source.

Shipment

The Source Custodian should consult with a Radiological Control Technician if there is a need to store this source in a new location. Transportation of this source to another building onsite must be arranged by the Source Custodian with a Radiological Control Technician. Transportation of this source to an offsite location must be arranged by the Source Custodian with a Radiological Control Technician and with the Isotopes and Special Materials Group.

