



## POTOMAC STATE COLLEGE PROCEDURE

APPROVED:

A handwritten signature in blue ink, appearing to read 'Jennifer E. Orlikoff', written over a horizontal line.

Jennifer E. Orlikoff  
Campus President  
March 21, 2017

### Handling and Storage of Radioactive Materials in the Chemistry Department

#### Purpose

The purpose of this document is to set forth official procedures for the handling, use, and storage of radioactive sources in the Chemistry Department of Potomac State College. At present, Chemistry is the only department on campus that has such sources. This procedure may be generalized to apply to any department that uses or stores radioactive materials on campus. These procedures are to be adhered to rigorously, since radioactive materials are closely regulated by Federal Governmental agencies and WVU.

#### Policy

##### Types of Radioactive Sources

The Chemistry Department has two types of radioactive sources. They are: (1) Plastic Disk Sources, Beta emitting Tl-206 and gamma emitting Co-60 sources, and (2) Low level radioactive mineral collection consisting of 1/2 inch pieces of radioactive minerals such as carnotite (an ore of uranium).

##### Storage

All radioactive materials are stored in a locked lead lined storage box kept in Room 314 Science Hall (a locked dead bolted preparation and storage room for Organic Chemistry). There are only two keys to the lead lined storage box. One key is stored in Room 309 Science Hall (a locked dead bolted preparation and storage room for General Chemistry) in a locked drawer. The Coordinator of General Chemistry has a key to the drawer. The other key to the lead lined box is held by the Campus President on the office key ring. The latter key is for emergency use only. The Campus Police know the location of both keys in case of emergency.

##### Uses of Radioactive Materials

**Uses of Radioactive Materials**

Radioactive sources are used for two purposes in the Chemistry Department, laboratory use by students and demonstration purposes.

**Methods to Obtain Radioactive Materials**

Upon receipt of a written request submitted 24 hours before use, the Coordinator of General Chemistry will obtain the source(s) and present them to the faculty member requesting them. The source(s) will be returned to the Coordinator of General Chemistry immediately after each use. The Coordinator of General Chemistry will return the sources to the lead lined box. For laboratory class use, the Preparation Room Manager will inform the Coordinator of General Chemistry, IN PERSON, when the sources will be used and the number required. The Coordinator of General Chemistry and the Preparation Room Manager will obtain the required number of sources from the locked lead lined box in Room 314 and deliver them to Room 308. Immediately after their use he will return them to the locked lead lined box.

**Storage in the Laboratory**

The beta and gamma sources will be kept on the laboratory benches in Room 308. Appropriate warning signs will be placed at each storage position on the laboratory benches. In addition, a warning sign will be placed at the entrance to the laboratory warning of the presence of radioactive materials in the room.

Beta and gamma sources will be placed close to the warning signs with the emitting side placed down on the bench surface. This allows rays and particles to be stopped by the bench top and the 17 inch concrete floor below. Sources are never to be stored with the emitting side pointing in any other direction. (Accidental exposure of anyone in the lab could occur.) The sources are never to be left closer than 3 feet from the Geiger counter tube face.

**Personal Precautions**

Radioactive sources should be kept away from the eyes. Contact of radioactive rays and particles with the eyes can cause blindness. Never point the emitting side of the radioactive source toward the eyes. Never attempt to remove the radioactive material from the plastic disk. Never attempt to remove the plastic disk from its aluminum "L" holder. Never poke at the emitting side of the disk with sharp objects such as knives or needles. Never place the sources in your pockets or remove them from their work area within the lab. Never allow the emitting side of a source to face toward a doorway or any area where people will be walking.

**Radioactive Mineral Specimens**

The radioactive mineral collection will be stored under the hood at the far north end of the laboratory. Appropriate radioactive material warning signs will be placed near the collection box.

**Special Precautions**

During times when the Chemistry 112 laboratory classes will be using radioactive sources, the Chemistry 116 laboratory classes will meet on the opposite side of Room 308 from the side using the radioactive sources. This allows for 18-20 feet of space between these students and the radioactive source. No Chemistry 116 laboratory classes will be allowed to meet on the side of the laboratory where radioactive sources are being stored. This allows for minimum moving of the radioactive sources and Geiger counters, as well as preventing accidental exposure of the Chemistry 116 laboratory students.

**Special Note**

Although these sources represent low level radioactive sources, they should nevertheless be treated with the respect given to all radioactive materials. The teaching of proper technique when handling radioactive materials is essential and cannot be understated.

The Chemical Hygiene Officer (CHO) will be given a yearly inventory of the radioactive sources, their location, and any new purchases. Any sources that require disposal will be sent to the WVU Radiation Safety Office by the CHO. The CHO will be responsible for the proper disposal of sources and keeping records of their disposal. The CHO will be responsible for reporting all regulated sources to the Nuclear Regulatory Commission and the storage of all registrations forms. The CHO will inspect the radioactive storage facilities and insure that they meet Federal guidelines. The CHO will immediately report to the Campus President any violations of these procedures or storage irregularities.