Radioactive Spills, Splashes, and Decontamination

SafetyNet #: 37

In laboratories where radioactive materials are used on a regular basis, spills and/or splashes may result in surface, equipment or personnel contamination. In most cases, the problem will be relatively minor and quick action by laboratory personnel can eliminate any potential complications.

Remember

- Minor spills and contamination (µCi amounts) of radioactive material should be handled by laboratory personnel. Situations involving 1 mCi or greater amounts, or problems with removing smaller amounts should be reported to the Office of Environmental Health & Safety (EH&S) and/or UC Davis Health (UCDH) Health Physics.
- Before beginning decontamination:
  - Wear double gloves and a laboratory coat.
  - Always work from the outside inward using the wipe and fold technique to avoid spreading contamination.
  - Be careful not to track contamination around the room or building.
  - Have a suitable receptacle ready, such as a plastic bag, in which to deposit contaminated gloves, paper towels, etc.
  - Put on shoe covers to prevent contamination of personal clothing.
  - Designate a clean area to change over from protective clothing to personal clothing.

Benchtop and Equipment Decontamination

- Locate and define the extent of contamination with a radiation survey meter and/or wipe tests. Wipes tests will reveal whether or not the contamination is readily removable. See SafetyNet #56 [1], “How to Monitor Your Laboratory for Radioactive Contamination”, for additional information.
- Mop up any liquid by using paper towels, sponges, etc. Dispose of the cleaning implements as radioactive waste. Place broken glass in a can or other hard walled receptacle prior to depositing in radioactive waste boxes.
- Soap and water, detergent, or any number of commercially available decontamination solutions can be used to remove dry contamination from most surfaces.
- Monitor the affected area. Repeat decontamination procedures if necessary.
- Call EH&S or UCDH Health Physics for non-removable contamination.

**Glassware Decontamination**
Bath solutions or rinse water from decontamination procedures must be assayed with a liquid scintillation or gamma well counter for activity level. Solutions showing less than

\[
\frac{\text{CPM}_{\text{BKG}}}{3^\sqrt{\text{CPM}_{\text{BKG}}}}
\]

can be disposed of appropriately as non-radioactive waste.

- After removing any visible residues, soak glassware in a decontamination solution for 24 hours. Commercially prepared cleansers or detergents with chelating or complexing agents are acceptable.
- Rinse, monitor, and repeat procedure if the levels of contamination remain unacceptable.

**Personnel Decontamination**
In the event of accidental contamination of personnel, **do not panic**. Most contamination that occurs in laboratories can be removed by one of the following methods. However, if the level of contamination is still unacceptable, call EH&S or UCDH Health Physics.

<table>
<thead>
<tr>
<th>Surface</th>
<th>Method</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin and hair</td>
<td>Wash with mild soap and lukewarm water</td>
<td>Wash 2-3 minutes and monitor. Repeat no more than 3-4 times, using care not to abrade the skin.</td>
</tr>
<tr>
<td>Eyes, ears, nose, mouth, wounds</td>
<td>Flush with water</td>
<td>Flush affected area with large amounts of water. Call EH&amp;S or UCDH Health Physics. Call EH&amp;S or UCDH Health Physics.</td>
</tr>
<tr>
<td>Internal</td>
<td></td>
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</table>

**When is Something Contaminated?**

As a rule, decontamination is adequate when the results of wipe tests or assays reveal activity levels to be indistinguishable background.

For additional information, contact EH&S or UCDH Health Physics. For after-hours or emergency assistance, call 911.

**Contact**

**Research Safety**
researchsafety@ucdavis.edu 530-752-1493
FAX: 530-752-4527

**More information**
[https://safetyservices.ucdavis.edu/research-safety-staff-listing](https://safetyservices.ucdavis.edu/research-safety-staff-listing)
Related content

1. How to Monitor Your Lab for Radioactive Contamination

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