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

\[
\frac{\text{CPM}_{\text{BKG}}}{\text{BKG}} + 3\sqrt{\text{CPM}_{\text{BKG}}} < \text{Threshold}
\]

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>
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<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.</td>
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<tr>
<td>Internal</td>
<td></td>
<td>Call EH&amp;S or UCDH Health Physics.</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**

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**More information**