

Any time you use dispersible amounts of radioactive materials, you need to check your working surfaces for contamination when finished. Removable contamination can be analyzed by a wipe test; fixed contamination, by a survey meter.

Areas with removable contamination must be cleaned until activity is at background levels. Fixed contamination must be demarcated with Rad Tape for future identification and covered with appropriate shielding material.

The entire lab must be surveyed and/or wipe-tested at least once per month. Survey results are calculated in disintegrations per minute (dpm). The RSO may recommend different wipe test frequencies depending on the radionuclides and amounts used.

Contamination Wipe Test

1. Sample each room/area with a filter disk or glass fiber. Wipe a 100 cm² area (include various work surfaces e.g., door knobs, refrigerator handles, sink parts, floor areas, etc.). Place each filter disk in a liquid scintillation vial and identify location of swipe on a map of the work area. Include a clean filter disk vial as a background control.
2. Use control vials containing appropriate standards (H-3, C-14, I-125, etc.) to verify counter efficiency.
3. Count vials to attain a 95% confidence level with settings appropriate to the isotopes used in the laboratory.
4. Determine the activity of each vial in disintegrations per minute (dpm) per 100 cm².
 - Net counts per minute (cpm) = gross cpm - background cpm
 - Standard disintegrations per minute (dpm) = uCi x 2.22x10⁶ dpm/uCi = Bq x 60
 - Efficiency of counting (E) = net cpm of standard / standard dpm
 - Then sample dpm/100cm² = (net cpm / 100 cm²) / E
5. Records of all wipe test results must be maintained on file in each laboratory.

What I need to do...

- Check for radioactive contamination after working with radioisotopes.
- Wipe test all surfaces.
- Clean removable contamination until background activity is achieved. CAUTION: Wear appropriate PPE.

Contamination Survey Test

1. Select survey meter/probe(s) for the nuclide(s) of interest, identify the probe's surface area, and verify that the meter is calibrated.
2. Take a background reading measurement away from sources of contamination.
3. Slowly move probe over various work surfaces including door knobs, refrigerator handles, sink parts, floor areas, etc.
4. Note contaminated areas on a survey map of the work area. Calculate the dpm/100cm² contamination level calculated as follows:
 - Sample dpm/100cm² = (Sample cpm - Background cpm) / (Surface area of probe in cm²) * (100 cm²) / Efficiency
5. Records of survey tests must be maintained on file in each laboratory.



References

USC Radiation Safety Manual <https://adminopsnet.usc.edu/node/428>