

^{210}Po	Nuclide Safety Data Sheet Polonium-210 radsafety@berkeley.edu	^{210}Po
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I. PHYSICAL DATA

Radiation ¹ :	Gamma: 803 keV (<1%) Alpha: 5,304 keV (100%)
Gamma Constant ² :	
Half-life [T _{1/2}]:	Physical ⁱ : 138 days Biological ³ : ~ 50 days; (excretion: 90% feces, 10% urine) Effective: ~ 37 days
Specific Activity:	286,500 Ci/g [10,600 TBq/g] max.
Beta Range:	Air: 610 cm [240 inches; 20 feet] Water/Tissue: 0.76 cm [0.33 inches] Plastic: 0.61 mm [3/8 inches]

II. RADIOLOGICAL DATA

Radiotoxicity ⁴ :	6.36E-12 Sv/Bq [0.023 mrem/uCi] of ¹⁴ CO ₂ inhaled; 5.64E-10 Sv/Bq [2.09 mrem/uCi] organic compounds inhaled/ingested
Critical Organ:	Fat tissue [most labeled compounds]; bone [some labeled carbonates]
Exposure Routes:	Ingestion, inhalation, puncture, wound, skin contamination absorption
Radiological Hazard:	External Exposure - None from weak ¹⁴ C beta Internal Exposure & Contamination - Primary concern

III. SHIELDING

Shield ³²P with 3/8 inch Plexiglas and monitor for Bremstrahlung; If Bremstrahlung X-rays detected outside Plexiglas, apply 1/8 to 1/4 inch lead [Pb] shielding outside Plexiglas

IV. DOSIMETRY MONITORING

Always wear radiation dosimetry monitoring badges [body and/or ring] if required by your RUA.

V. DECTION & MEASUREMENT

Portable Survey Meters:	Geiger-Mueller [e.g. Ludlum 44-9]
Wipe Test:	Gamma Counter, Well Gamma Counter, or Liquid Scintillation Counter.

VI. SPECIAL PRECAUTIONS

- * Because of low gamma constant, no need to store ²¹⁰Po behind lead (Pb) shielding unless accessible dose rates >2 mR/hr observed.
- * Use tools to indirectly handle unshielded sources and potentially contaminated vessels; avoid direct hand contact.
- * Ensure that an appropriate, operational survey meter (e.g. Ludlum 44-9) is present in the work area and turned on whenever ²¹⁰Po is handled, so that any external exposure issues will be immediately apparent and hence quickly addressed.
- * Shield waste containers as needed to maintain accessible dose rate ALARA and < 2 mR/hr.

VII. LAB PRACTICES

1. Disposable gloves, lab coats, and safety glasses are the minimum PPE [Personal Protective Equipment] required when handling radioactive material. Remove & discard potentially contaminated PPE prior to leaving the area where radioactive material is used.
2. Clearly outline radioactive material use areas with tape bearing the legend "radioactive." Cover lab bench tops where radioactive material will be handled with plastic-backed absorbent paper; change this covering periodically and whenever it's contaminated. Alternately cover benches with thick plastic sheeting (i.e. painter's drop cloth), periodically wipe it clean and replace it if torn.
3. Label each unattended radioactive material container with the radioactive symbol, isotope, activity, and, except for waste, the ICN [inventory control number]. Place containers too small for such labels in larger labeled containers.
4. Handle radioactive solutions in trays large enough to contain the material in the event of a spill.
5. Never eat, drink, smoke, handle contact lenses, apply cosmetics, or take/apply medicine in the lab; keep food, drinks, cosmetics, etc. out of the lab entirely. Do not pipette by mouth.

¹ Delacroix et al, Radiation Protection Dosimetry - Radionuclide and Radiation Protection Data Handbook 2002 (Kent, England: Nuclear Technology Publishing, 2002), p. 146

² Shleien et al, Eds. Handbook of Health Phys. & Rad. Health, 3rd ed. (Baltimore, MD: Williams & Wilkins, 1998), p. 6-13

³ NRC: NUREG/CR-4884 Interpretation of Bioassay Measurements (Upton, New York: Brookhaven National Laboratories, 1987), p. B-788149

⁴ Federal Guidance Report No. 11 (Oak Ridge, TN; Oak Ridge National Laboratory, 1988), p. 175, 149

6. Never store [human] food and beverage in refrigerators/freezers used for storing radioisotopes.
7. Prevent skin contact with skin-absorbable solvents containing radioactive material.
8. Fume hoods and biological safety cabinets for use with non-airborne radioactive material must be labeled "Caution Radioactive Material".