



Radioactive Materials Reference Sheet:

³³P

Phosphorous-33

Half-life	: 25.3 days
Type of Emitter	: Beta
Beta Energy	: 0.249 MeV
Travel Distance in Air	: 0.89 m : 35 inches : 2.9 feet
Travel Distance in Plexiglas/Lucite	: 0.089 cm : 0.035 inches
Annual Intake Limits	
Inhalation	: 3 mCi
Ingestion	: 6 mCi

CONCERNS

Some of the energetic (not as high as with ³²P) betas emitted from ³³P can penetrate gloves and the outer dead layer of skin, creating an external exposure hazard. One should be careful not to contaminate the skin. Some ³³P compounds may be incorporated in the skin causing very large skin doses and a pathway into the body.

SHIELDING

- None required for quantities less than a mCi.
- 1/8 inch thick plexiglas, acrylic, lucite, plastic or plywood is recommended for mCi quantities. This shielding requirement also applies to waste containers.

DETECTION

- GM survey meter with a pancake probe (has a detection efficiency of approximately 10% (under ideal conditions)). However, covering the window with plastic wrap or paraffin film will stop most or all of the betas from entering the detector.
- Liquid scintillation counting of wipes may be used to detect removable surface contamination. This is the preferred method for detecting ³³P.



SPECIFIC EQUIPMENT / SUPPLIES

In addition to general equipment, the following is recommended for specific use of ³³P :

- 1/8 inch thick plexiglas, acrylic, lucite, plastic or plywood shielding (for mCi amounts).

Laboratory Safety

SAFETY RULES FOR ³³P

- Follow General Safety Precautions for all isotopes.

Specific Recommendations:

WHILE WORKING

- Avoid skin exposure by using tools to indirectly handle unshielded sources and potentially contaminated vessels. Do not directly hold test tubes or micro-centrifuge tubes. Increasing distance lowers exposure. Also, employ plastic racks to minimize skin exposure.
- Suitable traps may be necessary to collect ³³P if large gas or vapor releases are anticipated.
- For mCi amounts, do not work over open containers of ³³P without shielding. Work with a Plexiglas shield (1/8 inch thickness) between you and the radioactive material .
- Shield all stock vials.



POST-USE

- Dispose of ³³P waste according to the waste disposal guidelines. If by sink disposal, ensure that it is soluble in water and does not exceed the posted limit (50 μ Ci daily, if only one radionuclide is being disposed of). Do not exceed this limit, unless otherwise authorized by the Radiation Safety Committee in the permit.
- ³³P waste, in mCi amounts, should be stored in a plexiglas (or acrylic, lucite, plastic or plywood) shielded (lined, etc...) container to minimize possible exposures. ³³P waste must be segregated and kept separate from ¹²⁵I, ³²P, ³⁵S and other radioactive wastes. The waste should be consolidated and stored in an isolated spot away from work and high traffic areas.