# PROPERTIES OF COMMONLY USED RADIONUCLIDES

| Nuclide | Half-life | Type of emission | Emax of principal emission (MeV) | Monitoring Method | Range in air | Absorber | Shielding | Other Comments |
|---|---|---|---|---|---|---|---|---|
| $^{3}H$ | 12.28 y | β | 0.019 | Wipe test | 4.7mm | Air | None required | Cannot penetrate the outer, dead layer of skin. |
| $^{14}C$ | 5730 y | β | 0.156 | EP15/EL | 22cm | Thick paper /thin card | None required | Prolonged contact with skin can deliver significant dose. |
| $^{35}S$ | 87.4 d | β | 0.167 | EP15/EL | 24cm | Thick paper /thin card | Perspex for > 1mCi amounts | Some compounds are volatile, e.g. $^{35}S$ methionine. Handle in fume hood & use traps during incubation. Prolonged contact with skin can deliver significant dose. |
| $^{33}P$ | 25.4 d | β | 0.249 | EP15/EL | 46cm | 3mm Perspex | Perspex ≥ 3mm thick | Gloves + outer dead layer of skin give adequate protection to hands during normal operations but prolonged contact with skin can deliver significant dose. |
| $^{32}P$ | 14.29 d | β | 1.71 | E/EP15/EL S/SL | 6m | 6mm Perspex | Perspex ≥ 6mm thick | Significant eye/skin dose hazard. Use forceps or tongs whenever possible. Always use shielding. For mCi amounts, shield Brems by placing lead sheet (3-6mm) around primary Perspex shield or use a Duo-shield[1]. |

[1]Duo-shield – a regular Perspex shield with a layer of leaded Perspex fastened to the surface facing the worker.

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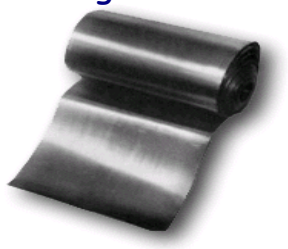
| $^{125}I$ | 60.14 d | γ X-rays | 0.035 0.027 & 0.031 | 42/44 A or B | 135m (for 99% reduction) | Lead HVL[1] = 0.02mm | 1mm lead sheet or 1cm leaded Perspex | Compounds are volatile - handle in fume hood & use traps during incubation. If inhaled, 30% concentrates in the thyroid[2] where it can be detected with a 42/44 probe. |
| $^{51}Cr$ | 27.7d | γ X-ray | 0.32 0.005 | 42/44 B are best but type A is OK | 337m (for 99% reduction) | Lead HVL = 1.7mm | 0.5-1 cm lead | When this thickness of lead is not practical, use thinner sheets or leaded Perspex, but minimise time and maximise distance. |

**1**

**Half Value Layer**

The shield thickness necessary to reduce exposure by 50%. Varies according to shielding material.



**2**