

**SAFETY DATA SHEET****¹⁴C****CARBON-14****PHYSICAL DATA:**

Radiation: Beta (β^-) - 100% abundance
Energy: Max: 156 keV; Avg: 49 keV
Half Life ($T_{1/2}$) Physical - 5730 yrs
Biological - 12 d
Effective - 12 d (bound); 40 d (unbound)
Specific Activity: $1.65E + 11 \text{ Bq}\cdot\text{g}^{-1}$
Beta Range: Air: 24 cm.
Water/Tissue: 0.28 mm
Plexiglass: 0.3 mm

RADIOLOGICAL DATA:

Exemption Quantity $1 \times 10^6 \text{ Bq}$
Radiotoxicity Moderate
Critical organ Fat tissue
Exposure routes Ingestion, inhalation, absorption
Radiological hazard External - dose to skin from contamination in $\text{mSv}\cdot\text{h}^{-1} = 3.24E-1/\text{kBq}\cdot\text{cm}^2$
Internal - primary concern

SHIELDING:

0.75 - 3 mm plexiglass

DOSIMETRY REQUIREMENTS

External dosimetry not required; urine bioassay for suspected intake

DETECTION

Liquid scintillation counting
Pancake GM detector - 3.75% efficiency @ cm (**2.25% probe protected with saran wrap;**
0.06% protected with parafilm)

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Lab coats, double gloving

SPECIAL PRECAUTIONS

Avoid skin contamination by double gloving (change outer pair ~ every 30 minutes), use remote handling devices where possible

¹⁴C Handling Procedures:

1. Designate an area for handling ¹⁴C and label clearly
2. Do not consume food and/or drink in the laboratory
3. Do not pipette by mouth
4. Cover work surfaces with absorbent liners
5. Use transfer pipettes and spill trays to confine contamination
6. Promptly return stock solutions to storage areas
7. Maintain contamination control by regularly monitoring and promptly cleaning contaminated areas
8. Isolate waste in clearly labelled containers and arrange for disposal with the RSO
9. Maintain cleanliness and good housekeeping in the work area
10. Supervise nuclear substances at all times when in use
11. Keep laboratory locked when unattended