

## Carbon-14

1. Radioactive Material Identification
Common Names: Carbon-14
Atomic Number: 6
Chemical Form: Carbon dioxide, carbon monoxide
Chemical Symbol: C-14 or <sup>14</sup> C
Mass Number: 12 (8 neutrons)
Physical Form: Organic compounds

2. Radiation Characteristics																									
Physical half-life: 5,730 years																									
Specific Activity (GBq/g): 165																									
<table border="1"> <thead> <tr> <th>Principle Emissions</th> <th>E<sup>Max</sup> (keV)</th> <th>E<sup>eff</sup> (keV)</th> <th>Dose Rate (μSv/h/GBq at 1m)</th> <th>Shielding Required</th> </tr> </thead> <tbody> <tr> <td>Beta* (β)</td> <td>156.4 (100%)</td> <td>49.5</td> <td>-</td> <td>≤3mm Plexiglas (recommended, not required)</td> </tr> <tr> <td>Gamma (γ) / X-rays</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Alpha (α)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Neutron (n)</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Principle Emissions	E <sup>Max</sup> (keV)	E <sup>eff</sup> (keV)	Dose Rate (μSv/h/GBq at 1m)	Shielding Required	Beta* (β)	156.4 (100%)	49.5	-	≤3mm Plexiglas (recommended, not required)	Gamma (γ) / X-rays	-	-	-	-	Alpha (α)	-	-	-	-	Neutron (n)	-	-	-	-
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Progeny: Nitrogen-14 (N-14)																									



### 6. Non-radiological Hazards

Prolonged exposure to airborne particles may result in cell damage, with the potential for subsequent cancers.

OSHA Permissible Exposure Limit (PEL):  
0.1 mg/m<sup>3</sup>

### 7. Emergency Procedures

#### Personal Decontamination Procedures

- Wash well with soap and water, and monitor skin
- Do not abrade skin, only blot dry
- Decontamination of clothing and surfaces are covered under operating and emergency procedures

#### Spill and Leak Control

- Alert everyone in the area
- Confine the problem or emergency (includes the use of absorbent material)
- Clear area
- Summon aid

#### Damage to Sealed Radioactive Source Holder

- Evacuate the immediate vicinity around the source holder
- Place a barrier at a safe distance from the source holder (minimum 5 meters)
- Identify area as a radiation hazard
- Contact emergency number posted on local warning sign

#### Suggested Emergency Protective Equipment

- Gloves
- Footwear Covers
- Safety Glasses
- Outer layer or easily removed protective clothing (as situation requires)