Radioisotope Safety Data Sheet
Zinc 65

Half life 244 days

Radiations emitted

| Radiation               | Energy, keV | Yield  
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Positrons</td>
<td>330 max, 143 avg</td>
<td>1.4 %</td>
</tr>
<tr>
<td>Kα and Kβ X-rays</td>
<td>8.03, 8.05 and 9</td>
<td>~39 %</td>
</tr>
<tr>
<td>Gamma ray</td>
<td>1116</td>
<td>51 %</td>
</tr>
<tr>
<td>Annihilation photons</td>
<td>511</td>
<td>~3 %</td>
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Safety precautions

65Zn is a high energy gamma ray emitter presenting both an internal and external hazard.

Handling tools and standard laboratory PPE (gloves, lab coat, safety glasses) should be used to minimise exposure.

Amounts of 37 MBq or greater should only be manipulated behind lead bricks. A single thickness wall of two courses of 50 mm bricks should provide sufficient shielding while allowing good access.

Lead brick shielding may also be required for wastes stored for decay in the laboratory. The RSO should carefully monitor stored wastes to ensure that radiation levels in controlled areas do not exceed 40 µSv per week, and in areas accessible to non-radiation workers, 10 µSv per week.

Radiotoxicity data

65Zn is classed as being of lower hazard (group 4) according to AS 2243.4.

The Annual Limit on Intake by ingestion (ALI\textsubscript{ing}) is 5 MBq and the most restrictive inhalation limit (ALI\textsubscript{inhal}) is 6.9 MBq.

Dose rates

The gamma ray dose rate constant is 85 µSv/h/ GBq @ 1 m

Dose rate to the basal skin cells from contamination of 1 kBq cm\textsuperscript{-2} 1000 µSv h\textsuperscript{-1}

Dose rate from a 1 kBq (0.05 ml) droplet on skin: 390 µSv h\textsuperscript{-1}

Shielding

Half value layer (HVL) for X and gamma rays 14 mm lead

Tenth value layer (TVL) for X and gamma rays 42 mm lead

Licensing requirements

Under the Radiation Safety Regulation 2010, a licence is required for the possession of 65Zn sources with concentrations of greater than or equal to 10 Bq per gram and with activities of 1 MBq or greater. A user licence is also required for any persons who use such sources for research purposes.

Disposal data

The maximum concentration of 65Zn in aqueous wastes released to a sewerage system is given in the 2010 Radiation Safety Regulation as 350 kBq per m\textsuperscript{3} i.e. 350 Bq per litre.

The concentration of 65Zn in solid wastes disposed of to either the general or pathology waste streams must be less than 5 Bq per gram (5 kBq per kg) – i.e. half the concentration limit for licensing.

Radiation detection and monitoring

Either a Geiger Muller tube or scintillation monitor is suitable for contamination control. For personal monitoring, TLD dosemeters are recommended for both whole body and extremity monitoring. (For details see the Personal Radiation Monitoring Safety Guideline).

Laboratory requirements

Indicative maximum activities:

<table>
<thead>
<tr>
<th>Low level</th>
<th>Bench</th>
<th>1 MBq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fume cupboard</td>
<td>10 MBq</td>
<td></td>
</tr>
<tr>
<td>Medium level</td>
<td>Bench</td>
<td>3.7 MBq</td>
</tr>
<tr>
<td>Fume cupboard</td>
<td>37 MBq</td>
<td></td>
</tr>
</tbody>
</table>