

⁶⁵Zn

Radioisotope Safety Data Sheet Zinc 65

Half life 244 days

Radiations emitted

Radiation	Energy, keV	Yield
Positrons	330 max, 143 avg	1.4 %
K α and K β X-rays	8.03, 8.05 and 9	~39 %
Gamma ray	1116	51 %
Annihilation photons	511	~3 %

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 μ Sv per week, and in areas accessible to non-radiation workers, 10 μ Sv 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_{ing}) is 5 MBq and the most restrictive inhalation limit (ALI)_{inhal} is 6.9 MBq.

Dose rates

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

Dose rate to the basal skin cells from contamination of 1 kBq cm⁻² 1000 μ Sv h⁻¹

Dose rate from a 1 kBq (0.05 ml) droplet on skin: 390 μ Sv h⁻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 m³ 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 dosimeters are recommended for both whole body and extremity monitoring. (For details see the Personal Radiation Monitoring Safety Guideline).

Laboratory requirements

Indicative maximum activities:

Low level	Bench	1 MBq
	Fume cupboard	10 MBq
Medium level	Bench	3.7 MBq
	Fume cupboard	37 MBq