

⁵⁵Fe

Radioisotope Fact Sheet Iron 55

Half life 2.68 years

Radiations emitted

Radiation	Energy (keV)	Yield (%)
X-ray	5.9	16.6
X-ray	5.89	8.4
X-ray	6.49	2.2
X-ray	6.49	1.1
Auger electron	5	61

Safety precautions

⁵⁵Fe is a very low energy X-ray emitter. In MBq amounts it presents only an internal hazard.

Standard laboratory PPE (gloves, lab coat, safety glasses) should be used to avoid skin contamination and ingestion.

Radiotoxicity data

⁵⁵Fe is classed in Group 2 according to AS/NZS 2243.4.

The Annual Limit on Intake by ingestion (ALI_{ing}) is 61 MBq and the most restrictive inhalation limit (ALI)_{inhal} is 22 MBq.

Shielding

No shielding is required while using MBq amounts of ⁵⁵Fe.

Licensing requirements

Under the *Radiation Safety Regulation 2021*, a licence is required for the possession of ⁵⁵Fe sources with concentrations of greater than 10 kBq 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 ⁵⁵Fe in aqueous wastes released to a sewerage system is given in the Radiation Safety Regulation as 4.15 MBq per m³ i.e. 4.15 kBq per litre.

The concentration of ⁵⁵Fe in solid wastes disposed of to either the general or pathology waste streams must be less than 5 kBq per gram (5 MBq per kg) – i.e. half the

concentration limit for licensing. Wastes containing ⁵⁵Fe should not be placed in a decay store as there will be no significant diminution in activity and accountability for the waste may be lost. Users should consult their RSO to determine the most appropriate method of waste disposal.

Radiation detection and monitoring

The low energy X-rays from ⁵⁵Fe are very difficult to detect with anything other than a beryllium window thin crystal scintillation detector. However, liquid scintillation counting of surface wipes can be used to detect removable contamination. Such wipes should be taken at the completion of labelling operations or, if ⁵⁵Fe use is continuous, at least at weekly intervals.

There is no requirement for personal monitoring for ⁵⁵Fe users, nor are there any personal dosimeters capable of responding to energies this low.

Laboratory requirements

Indicative maximum activities:

Low level	Bench	7.4 MBq
	Fume cupboard	74 MBq
Medium level	Bench	20 MBq
	Fume cupboard	200 MBq