

35S

Radioisotope Fact Sheet

Sulfur 35

Half life 87.5 days

Radiations emitted

Radiation	Energy (keV)	Yield (%)
Beta ray	168 - max, 49 - average	100

Safety precautions

³⁵S is a low energy beta emitter that only presents an internal hazard. Perspex shielded workstations are not required because of the limited range of the beta rays in air. Handling tools and standard laboratory PPE (gloves, lab coat, safety glasses) should be used to avoid skin contamination.

Work areas and equipment should be monitored using a suitable survey meter.

In general, many sulfur compounds are slightly volatile and may create contamination problems unless carefully controlled. A fume cupboard should be used when handling volatile compounds or for processes that could produce aerosols. Inorganic forms are more hazardous in this respect.

Radiotoxicity data

³⁵S is classed as being of high hazard (Group 2) according to AS/NZS 2243.4

The Annual Limit on Intake by ingestion (ALI_{ing}) is 26 MBq and the most restrictive inhalation limit (ALI_{inhal}) is 15 MBq.

Dose rates

Beta dose rate to the basal skin cells from contamination of 1 kBq cm⁻²: 354 μSv h⁻¹

Beta dose rate from a 1 kBq (0.05 ml) droplet on skin: 4.05 μSv h⁻¹

Shielding

Maximum range of ³⁵S beta radiation in air: 29 cm.

There is very low potential for bremsstrahlung production and perspex shielding of workstations and waste containers is not necessary.

Licensing requirements

Under the *Radiation Safety Regulation 2021*, a licence is required for the possession of ³⁵S sources with concentrations of greater than or equal to 100 kBq per gram and with activities of 10 MBq or greater. A use licence is required for any person who uses such sources for research purposes.

Disposal data

The maximum concentration of ³⁵S in aqueous wastes released to a sewerage system is given in the *Regulation* as 1.78 MBq per m³ i.e. 1.78 kBq per litre.

The concentration of ³⁵S in solid wastes disposed of to either the general or pathology waste streams must be less than 50 kBq per gram (50 MBq per kg) – i.e. half the concentration limit for licensing. Lengthy storage may be required for solid wastes so appropriate records need to be kept and durable labels applied to waste packages.

Radiation detection and monitoring

A large diameter end-window or pancake type Geiger Muller tube monitor is the most suitable meter for contamination control. TLD/OSL personal dosimeters are barely capable of responding to ³⁵S beta radiation and are not mandatory.

Laboratory requirements

Indicative maximum activities:

Low level	Bench	7.4 MBq
	Fume cupboard	74 MBq
Medium level	Bench	37 MBq
	Fume cupboard	200 MBq