

^{36}Cl

Radioisotope Fact Sheet

Chlorine 36

Half life 3×10^5 years

Radiations emitted

Radiation	Energy (keV)	Yield (%)
Beta ray	709 - max, 251- average	98

Safety precautions

^{36}Cl is a medium energy beta emitter that presents both an internal and external hazard. Perspex shielding is required for workstations and waste bins. Handling tools, Perspex tube holders and standard laboratory PPE (gloves, lab coat, safety glasses) should be used to avoid skin exposure.

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

A fume cupboard should be used when handling volatile compounds or for processes that could produce aerosols.

Because of the potential for bremsstrahlung X-ray production, ^{36}Cl wastes should only be stored in Perspex bins and not in metal containers.

Radiotoxicity data

^{36}Cl is classed as being of low hazard (Group 4) according to AS/NZS 2243.4.

With the energy of the beta emission and the long half life, the very low specific activity (1220 Bq/ μg , vs 10^{10} Bq/ μg for ^{32}P) means that relatively large masses would need to be taken into the body to produce appreciable doses.

The Annual Limit on Intake by ingestion (ALI_{ing}) is 22 MBq and the most restrictive inhalation limit ($\text{ALI}_{\text{inhal}}$) is 2.9 MBq.

Dose rates

Beta dose rate to the basal skin cells from contamination of 1 kBq cm^{-2} 1780 $\mu\text{Sv h}^{-1}$

Beta dose rate from a 1 kBq (0.05 ml) droplet on skin: 773 $\mu\text{Sv h}^{-1}$

Shielding

Total absorption of beta radiation is achieved with 2.4 mm perspex or 1.5 mm glass.

Maximum range in air: 2.6 m

Licensing requirements

Under the *Radiation Safety Regulation 2021*, a licence is required for the possession of ^{36}Cl sources with concentrations of greater than or equal to 10 kBq per gram and with activities of 1 MBq or greater. A use licence is also required for any persons who use such sources for research purposes.

Disposal data

The maximum concentration of ^{36}Cl in aqueous wastes released to a sewerage system is given in the *Regulation* as 1.47 MBq per m^3 i.e. 1.47 kBq per litre.

The concentration of ^{36}Cl 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 ^{36}Cl 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

A Geiger Muller tube monitor is the most suitable type of meter for contamination control. For personal monitoring, TLD/OSL dosimeters are recommended for both whole body and extremity monitoring.

Laboratory requirements

Indicative maximum activities:

Low level	Bench	370 kBq
	Fume cupboard	3.7 MBq
Medium level	Bench	1 MBq
	Fume cupboard	10 MBq