^{32}P

Radioisotope Fact Sheet

Phosphorus 32

Half life 14.29 days

Radiations emitted

Radiation	Energy (keV)	Yield (%)
Beta ray	1710 - max, 695 - average	100

Safety precautions

^{32}P is the highest energy beta emitter in general use and 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 minimise 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, ^{32}P wastes should only be stored in Perspex bins and not in metal containers.

Radiotoxicity data

^{32}P 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 8.3 MBq and the most restrictive inhalation limit (ALI_{inhal}) is 6.3 MBq.

Dose rates

Beta dose rate to the basal skin cells from contamination of 1 kBq cm^{-2}: 1890 µSv h^{-1}

Beta dose rate from a 1 kBq (0.05 ml) droplet on skin: 1330 µSv h^{-1}

Bremsstrahlung X-ray dose rate at 1 m from 1 MBq in a 10 ml glass vial: 0.0054 µSv h^{-1}

Shielding

Total absorption of beta radiation is achieved with 6.3 mm perspex or 3.4 mm glass.

Maximum range in air: 7.5 m

There is significant potential for bremsstrahlung production from interaction with high atomic number materials such as thin steel or lead sheets.

Licensing requirements

Under the *Radiation Safety Regulation 2021,* a licence is required to possess ^{32}P sources with concentrations equal to or greater than 1 kBq per gram and with activities of 100 kBq or greater. Individual use licences are required for persons who use licensable sources for research purposes.

Disposal data

The maximum concentration of ^{32}P in aqueous wastes released to a sewerage system is given in the *Regulation* as 571 kBq per m^3 i.e. 571 Bq per litre.

The concentration of ^{32}P in solid wastes disposed of to either the general or pathology waste streams must be less than 500 Bq per gram (500 kBq per kg) – i.e. half the concentration limit for licensing.

Radiation detection and monitoring

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

Laboratory requirements

Indicative maximum activities:

Low level	Bench	740 kBq
	Fume cupboard	7.4 MBq
Medium level	Bench	3.7 MBq
	Fume cupboard	37 MBq