

# 32P

## Radioisotope Safety Data Sheet Phosphorus 32

**Half life** 14.29 days

### Radiations emitted

Beta rays 1710 keV max, 695 keV  
average yield 100%

### Safety precautions

<sup>32</sup>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 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, <sup>32</sup>P wastes should only be stored in Perspex bins and not in metal containers.

### Radiotoxicity data

<sup>32</sup>P is classed as being of moderate hazard (group 3a) according to AS 2243.4

The Annual Limit on Intake by ingestion (ALI<sub>ing</sub>) is 8.3 MBq and the most restrictive inhalation limit (ALI)<sub>inhal</sub> is 6.3 MBq.

### Dose rates

Beta dose rate to the basal skin cells from contamination of 1 kBq cm<sup>-2</sup> 1890 μSv h<sup>-1</sup>

Beta dose rate from a 1 kBq (0.05 ml) droplet on skin: 1330 μSv h<sup>-1</sup>

Bremsstrahlung X-ray dose rate at 1 m from 1 MBq in a 10 ml glass vial: 0.0054 μSv h<sup>-1</sup>

### 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 2010* a licence is required to possess <sup>32</sup>P sources with concentrations equal to or greater than 1 kBq per gram and with activities of 100 kBq or greater.

In the University, possession licences are held by schools and centres rather than individuals. However, individual user licences are required for persons who use licenceable sources for research purposes.

### Disposal data

The maximum concentration of <sup>32</sup>P in aqueous wastes released to a sewerage system is given in the 2010 *Regulation* as 571 kBq per m<sup>3</sup> i.e. 571 Bq per litre.

The concentration of <sup>32</sup>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 dosimeters are recommended for both whole body and extremity monitoring. (For details see the *Personal radiation monitoring Safety Guideline*).

### Laboratory requirements

Low level lab guidance activities

Bench: 740 kBq  
Fume cupboard: 7.4 MBq

Medium level lab guidance activities

Bench: 3.7 MBq  
Fume cupboard: 37 MBq

NB: the guidance activities are maximum amounts that should need to be used in most research projects. Should greater activities need to be used, the advice of the University Radiation Protection Adviser should be sought.