Phosphorus - 32

$^{32}P_{15}$

Half life: 14.3 days
Specific activity: 1.06E+16 Bq.g^{-1}

Risk group: 2
Risk colour: Orange

Main emissions (keV)	Gamma or X		Beta (Emax)		Electrons		Alpha	
	E	%	E	%	E	%	E	%
E1			1710	100				
E2								
E3								
% omitted				0				

Exemption levels	
Quantity (Bq)	1E+05
Concentration (Bq.g^{-1})	1E+03

Transport (TBq)	
IAEA ST1 A_1 value	5E-1
IAEA ST1 A_2 value	5E-1

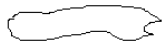
EXTERNAL EXPOSURE (mSv.h^{-1}) for an activity of 1 MBq or 1 MBq.m^{-2} (as appropriate)

Point source (30 cm)

Betas, electrons (skin dose): 1.18E-1

Gammas, X rays (deep tissue dose): 0.00E+0

Infinite plane source



Betas, electrons (skin)

10 cm	1.4E-01
1 m	4.8E-02

Photons (skin)

10 cm	0.0E+00
1 m	0.0E+00

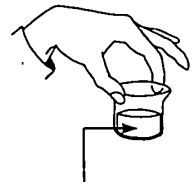
Photons (deep dose)

10 cm	0.0E+00
1 m	0.0E+00

10 ml glass vial

100 cm: 1.31E-6

Contact with 50 ml glass beaker



7.11E-4

Contact with 5 ml plastic syringe

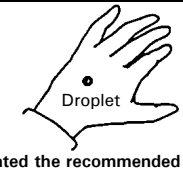
2.39E+1

The values above do not include Bremsstrahlung radiation.

CONTAMINATION

Contamination skin dose (mSv.h^{-1})

Uniform deposit (1kBq.cm^{-2})	1.89E+0
0.05 ml droplet (1 kBq)	1.33E+0



Detection

Recommended probes*	
Alpha	
Beta	+ +
Gamma	
X rays	

Derived limits (Bq.cm^{-2})

Removable contamination: 5E+1

Fixed contamination: 3E+2

* If no probes are indicated the recommended technique is to use a wipe test in association with a probe or liquid scintillation technique

SHIELDING (mm)

Betas and electrons (Total absorption)

Glass	3.4
Plastic	6.3

Gamma and X rays (half and tenth value thickness)

	½	1/10
Lead	-	-
Steel	-	-

INTERNAL EXPOSURE FOR WORKERS

COMMITTED EFFECTIVE DOSE PER UNIT INTAKE (Sv.Bq^{-1})

Ingestion	f_1	
All compounds	0.800	2.4E-09

Inhalation		1 µm	5 µm
All unspec. compounds	F	8.0E-10	1.1E-09
Some phosphat. det. by comb. cation	M	3.2E-09	2.9E-09
	S		

Highest dose organ: Lungs — **20 mSv ALI$_{ingestion}$**: 8.3E+06 (Bq) — **20 mSv ALI$_{inhalation}$**: 6.3E+06 (Bq)

MAXIMUM RECOMMENDED ACTIVITIES IN LOW LEVEL OR INTERMEDIATE LEVEL LABORATORIES (Bq)

PHYSICOCHEMICAL STATE	*Subject to external exposure requirements which may be more restrictive*					
	Volatility factor (k)	Supervised area		Controlled area		
		Bench	Fume hood	Bench	Fume hood	Glove box
All compounds	0.01	5E+05	5E+06	2E+06	2E+07	2E+09