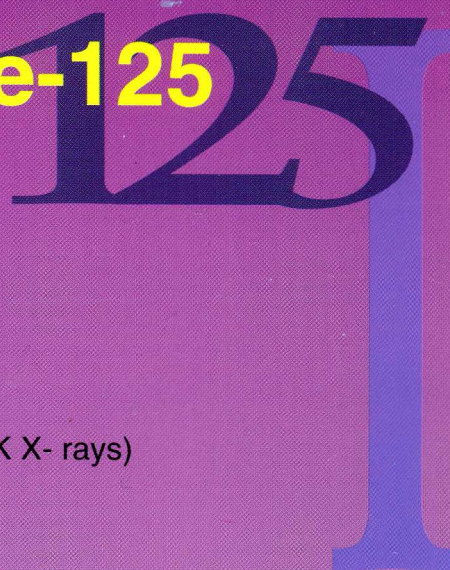




Iodine-125



WORKING SAFELY WITH IODINE-125

Radioactive half-life $T_{1/2}$ 59.6 days

Principal Emissions 35 keV gamma (7% emitted,
93% internally converted)
27-32 keV X-rays (140% Te K X- rays)

Monitoring for contamination Scintillation detector

Biological Monitoring Thyroid scans (scintillation detector)

Annual Limit on Intake (ALI) by inhalation 2×10^6 Bq (~55 μ Ci)*

Dose rate from 1 GBq point source at 1m 41 μ Sv/h (4.1 mrem/h)

First half value layer 0.02 mm lead

DAYS	0	2	4	6	8	10	12	14	16	18
0	1.000	0.977	0.955	0.933	0.911	0.890	0.870	0.850	0.830	0.811
20	0.793	0.774	0.756	0.739	0.722	0.706	0.689	0.673	0.658	0.643
40	0.628	0.614	0.600	0.586	0.572	0.559	0.546	0.534	0.521	0.509
60	0.498	0.486	0.475	0.464	0.454	0.443	0.433	0.423	0.413	0.404
80	0.394	0.385	0.377	0.368	0.359	0.351	0.343	0.335	0.328	0.320
100	0.313	0.305	0.298	0.292	0.285	0.278	0.272	0.266	0.260	0.254
120	0.248	0.242	0.236	0.231	0.226	0.221	0.215	0.211	0.206	0.201
140	0.196	0.192	0.187	0.183	0.179	0.175	0.171	0.167	0.163	0.159
160	0.156	0.152	0.149	0.145	0.142	0.139	0.135	0.132	0.129	0.126
180	0.123	0.120	0.118	0.115	0.112	0.110	0.107	0.105	0.102	0.100
200	0.098	0.095	0.093	0.091	0.089	0.087	0.085	0.083	0.081	0.079
220	0.077	0.076	0.074	0.072	0.071	0.069	0.067	0.066	0.064	0.063
240	0.061	0.060	0.059	0.057	0.056	0.055	0.053	0.052	0.051	0.050

Special Considerations

Volatilization of iodine is the most significant problem with this isotope. Simply opening a vial of sodium [¹²⁵I] iodide at high radioactive concentration can cause minute droplets of up to 100Bq to become airborne. Solutions containing iodide ions should not be made acidic nor stored frozen: both lead to formation of volatile elemental iodine. As some iodo-compounds can penetrate surgical rubber gloves it is advisable to wear two pairs, or polythene (polyethylene) gloves over rubber. In the event of suspected or actual significant contamination of personnel the thyroid should be blocked by administration of stable iodine as, for example, tablets of potassium iodate (170mg) or potassium iodide (130mg). To render any spilled iodine-125 chemically stable the area of the spill should be treated with alkaline sodium thiosulphate solution prior to commencing decontamination. Note, however, that the quantity of radioiodine in normal RIA kits (usually <370 kBq or 10 μ Ci) is such that these can be handled safely with reasonable care on the open bench.

* Based on occupational dose equivalent limit of 500 mSv for deterministic (non-stochastic) risks to the thyroid. In Germany the ALI value is 8x10⁵ Bq

The Annual Limit on Intake (ALI) data are based on the recommendations of the International Commission on Radiological Protection (ICRP) Publication 30 but may change should the ICRP Publication 60 recommendations be adopted by your national regulatory authority.

The data provided is general information which gives a basic understanding of radiation safety. You must however consult your local radiation protection adviser to ensure that you comply with all national regulations and local rules.