

Fact Sheet: Iodine-124 radiochemical

Iodine-124 radiochemical **-Half-Life: 100.3 hours**

This radionuclide can be used for a variety of PET applications, such as protein and antibody iodinations, as well as in the design and synthesis of new PET-tracers.

About BV Cyclotron VU

BV Cyclotron VU is a leading provider of PET-radiopharmaceuticals and radionuclides for the nuclear medicine community. Our expert team ensures reliable supply of our products and the highest possible product quality. Total annual output is about 35,000 patient doses.

Process Data

Nuclear reaction

$^{124}\text{Te}(p,n)^{124}\text{I}$

Chemical processing

Dry distillation of iodine from an activated target into an alkaline solution

Assay

Gamma-ray spectrometry: the most prominent gamma photon has an energy of 603 keV

Product Specification

Chemical form

^{124}I as iodide in NaOH solution

pH

> 10.0

Specific activity

No carrier added

Radioactivity concentration*

> 740 MBq/mL

Radionuclidic purity*

Iodine-124: $\geq 99.5\%$

Iodine-123: $< 0.5\%$

Iodine-125: $< 0.1\%$

Radiochemical purity

Iodide-124: $> 95\%$ of total activity

Heavy metals

Tellurium $< 1 \mu\text{g/mL}$

Endotoxin content

$< 17.5 \text{ EU/mL}$

Packaging

2.0 mL V-bottom screw top glass vials

Availability

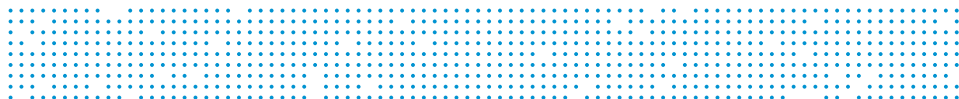
Dispensed every week

Delivery Service

Cyclotron counts on its cooperation partner PerkinElmer for the distribution of the diagnostic radionuclide ^{124}I .

* At reference time

Please note that iodine-124 is not tested for sterility. Verification of its suitability for use in humans is the sole responsibility of the purchaser.



Physical Data

Rad. Type	Energy (keV)	Radiation Intensity (%)
B+	685.9*	11
B+	973.6*	12
G-AN	511	45.96
G	602.72	62.9
G	722.78	10.35
G	1509.49	3.13
G	1691.02	10.88

*Mean β -energy

Decay Table

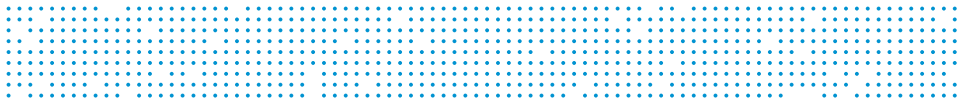
Physical half-life: 100.3 hours

Hours	0	1	2	3	4	5	6	7	8	9
0	1.000	0.993	0.986	0.979	0.973	0.966	0.959	0.953	0.946	0.940
10	0.933	0.927	0.920	0.914	0.908	0.902	0.895	0.889	0.883	0.877
20	0.871	0.865	0.859	0.853	0.847	0.841	0.836	0.830	0.824	0.818
30	0.813	0.807	0.802	0.796	0.791	0.785	0.780	0.774	0.769	0.764
40	0.758	0.753	0.748	0.743	0.738	0.733	0.728	0.723	0.718	0.713
50	0.708	0.703	0.698	0.693	0.689	0.684	0.679	0.674	0.670	0.665
60	0.661	0.656	0.652	0.647	0.643	0.638	0.634	0.629	0.625	0.621
70	0.616	0.612	0.608	0.604	0.600	0.596	0.591	0.587	0.583	0.579
80	0.575	0.571	0.567	0.563	0.560	0.556	0.552	0.548	0.544	0.541
90	0.537	0.533	0.530	0.526	0.522	0.519	0.515	0.512	0.508	0.505
100	0.501	0.498	0.494	0.491	0.487	0.484	0.481	0.477	0.474	0.471
110	0.468	0.464	0.461	0.458	0.455	0.452	0.449	0.446	0.442	0.439
120	0.436	0.433	0.430	0.427	0.424	0.422	0.419	0.416	0.413	0.410
130	0.407	0.404	0.402	0.399	0.396	0.393	0.391	0.388	0.385	0.383
140	0.380	0.377	0.375	0.372	0.370	0.367	0.365	0.362	0.360	0.357
150	0.355	0.352	0.350	0.347	0.345	0.343	0.340	0.338	0.336	0.333
160	0.331	0.329	0.326	0.324	0.322	0.320	0.318	0.315	0.313	0.311
170	0.309	0.307	0.305	0.303	0.300	0.298	0.296	0.294	0.292	0.290
180	0.288	0.286	0.284	0.282	0.280	0.278	0.277	0.275	0.273	0.271
190	0.269	0.267	0.265	0.263	0.262	0.260	0.258	0.256	0.255	0.253

To obtain a precalibration number, divide by the decay factor.

For a postcalibration number, multiply by the decay factor.

(See also: <http://2cyc.eu/d>)



More Information

Kemerink GJ, Visser MG, Franssen R, Beijer E, Zamburlini M, Halders SG, Brans B, Mottaghy FM, Teule GJ. Effect of the positron range of ^{18}F , ^{68}Ga and ^{124}I on PET/CT in lung-equivalent materials. *Eur J Nucl Med Mol Imaging*. 2011 May;38(5):940-8. PMID: 21287170.

Lopci E, Chiti A, Castellani MR, Pepe G, Antunovic L, Fanti S, Bombardieri E. Matched pairs dosimetry: $^{124}\text{I}/^{131}\text{I}$ metaiodobenzylguanidine and $^{124}\text{I}/^{131}\text{I}$ and $^{86}\text{Y}/^{90}\text{Y}$ antibodies. *Eur J Nucl Med Mol Imaging*. 2011 May;38 Suppl 1:S28-40. PMID: 21484381.

Lubberink M, Herzog H. Quantitative imaging of ^{124}I and ^{86}Y with PET. *Eur J Nucl Med Mol Imaging*. 2011 May;38 Suppl 1:S10-8. PMID:21484385.

Pryma DA, O'Donoghue JA, Humm JL, Jungbluth AA, Old LJ, Larson SM, Divgi CR. Correlation of in vivo and in vitro measures of carbonic anhydrase IX antigen expression in renal masses using antibody ^{124}I -cG250. *J Nucl Med*. 2011 Apr;52(4):535-40. PMID: 21421715.

Schmitz J. The production of [^{124}I] iodine and [^{86}Y]yttrium. *Eur J Nucl Med Mol Imaging*. 2011 May;38 Suppl 1:S4-9. PMID: 21484376.

Tijink BM, Perk LR, Budde M, Stigter-van Walsum M, Visser GWM, Kloet RW, Dinkelborg LM, Leemans CR, Neri D, van Dongen GAMS. ^{124}I -L19-SIP for immuno-PET imaging of tumour vasculature and guidance of ^{131}I -L19-SIP radioimmunotherapy. *Eur J Nucl Med Mol Imaging*. 2009 Aug;36(8):1235-44. PMID: 19259661.

Visser GW, Klok RP, Gebbinck JW, ter Linden T, van Dongen GA, Molthoff CF. Optimal quality ^{131}I -monoclonal antibodies on high-dose labeling in a large reaction volume and temporarily coating the antibody with IODO-GEN. *J Nucl Med*. 2001 Mar;42(3):509-19. PubMed PMID: 11337531.

BV CYCLOTRON VU
De Boelelaan 1081
1081 HV Amsterdam
Postbus 71802
1008 EA Amsterdam
The Netherlands

T + 31 (0)20 444 9123
F + 31 (0)20 444 9128
web@cyclotron.nl
twitter.com/cyclotronvu