

PERIODIC TABLE OF THE ELEMENTS

Table of Selected Radioactive Isotopes

Selected Radioactive Isotopes

Naturally occurring radioactive isotopes are designated by a mass number in blue (although some are also manufactured). Letter m indicates an isomer of another isotope of the same mass number. Half-lives follow in parentheses, where s, min, h, d, and y stand respectively for seconds, minutes, hours, days, and years. This table includes mainly the longer-lived radioactive isotopes; many others have been prepared. Isotopes known to be radioactive but with half-lives exceeding 10¹⁰ years have not been included. Symbols denoting the principal mode (or modes) of decay are as follows (these processes are generally accompanied by gamma radiation):

- α alpha particle emission
- β⁻ beta particle (electron) emission
- β⁺ positron emission
- ε orbital electron capture
- IT isomeric transition from upper to lower isomeric state
- sp spontaneous fission

GROUP 1/IA

1	1.00794
1	1.00794
2.02	
13.81	
0.08989	H
	¹ H Hydrogen

2/IIA

4	9.01218
2	9.01218
1615	
453.7	
0.53	Li
	⁷ Li Lithium

3

3	6.941
1615	
453.7	
0.53	Li
	⁷ Li Lithium

4

4	9.01218
2	9.01218
1615	
453.7	
0.53	Li
	⁷ Li Lithium

11

11	22.98977
1156	
1300	
971.0	
0.87	Na
	²³ Na Sodium

12

12	24.305
1156	
1300	
971.0	
0.87	Na
	²³ Na Sodium

19

19	39.0983
1033	
336.8	
0.86	K
	³⁹ K Potassium

20

20	40.078
1033	
336.8	
0.86	K
	³⁹ K Potassium

37

37	85.4678
967	
1655	
310.0	
1.532	Rb
	⁸⁵ Rb Rubidium

38

38	87.62
967	
1655	
310.0	
1.532	Rb
	⁸⁵ Rb Rubidium

55

55	132.9054
944	
1002	
1.87	Cs
	¹³³ Cs Cesium

56

56	137.33
944	
1002	
1.87	Cs
	¹³³ Cs Cesium

87

87	(223)
850	
300	
	Fr
	²²³ Fr Francium

88

88	(226)
850	
300	
	Fr
	²²³ Fr Francium

90

90	(232.0381)
5000	
2028	
11.72	Th
	²³² Th Thorium

91

91	(231.0359)
5000	
2028	
11.72	Th
	²³² Th Thorium

92

92	(238.0289)
9000	
2028	
11.72	Th
	²³² Th Thorium

93

93	(237)
9000	
2028	
11.72	Th
	²³² Th Thorium

104

104	(261)
1413	
973	
5.0	Fr
	²²³ Fr Francium

105

105	(262)
1413	
973	
5.0	Fr
	²²³ Fr Francium

106

106	(263)
1413	
973	
5.0	Fr
	²²³ Fr Francium

107

107	(264)
1413	
973	
5.0	Fr
	²²³ Fr Francium

108

108	(265)
1413	
973	
5.0	Fr
	²²³ Fr Francium

109

109	(266)
1413	
973	
5.0	Fr
	²²³ Fr Francium

110

110	(269)
1413	
973	
5.0	Fr
	²²³ Fr Francium

111

111	(272)
1413	
973	
5.0	Fr
	²²³ Fr Francium

112

112	(277)
1413	
973	
5.0	Fr
	²²³ Fr Francium

113

113	(283)
1413	
973	
5.0	Fr
	²²³ Fr Francium

114

114	(285)
1413	
973	
5.0	Fr
	²²³ Fr Francium

115

115	(286)
1413	
973	
5.0	Fr
	²²³ Fr Francium

116

116	(288)
1413	
973	
5.0	Fr
	²²³ Fr Francium

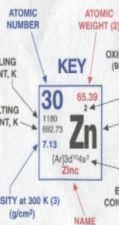
117

117	(291)
1413	
973	
5.0	Fr
	²²³ Fr Francium

118

118	(294)
1413	
973	
5.0	Fr
	²²³ Fr Francium

* Estimated Values



58	140.12	59	140.9077	60	144.24	61	(145)	62	150.36	63	151.964	64	157.25	65	158.9253	66	162.50	67	164.9303	68	167.26	69	168.9342	70	173.04	71	174.967
Ce	3.4	Pr	3.4	Nd	3.2	Pm		Sm	3.2	Eu	3.2	3.55	8.23	8.55	8.80	8.07	8.52	8.57	8.22	8.59	8.57	8.42	8.57	8.57	8.57	8.57	
[Xe]4f ¹ 5d ¹ 6s ²		[Xe]4f ² 6s ²		[Xe]4f ³ 6s ²		[Xe]4f ⁴ 6s ²		[Xe]4f ⁶ 6s ²		[Xe]4f ⁷ 6s ²		[Xe]4f ⁷ 6s ²		[Xe]4f ⁹ 6s ²		[Xe]4f ¹⁰ 6s ²		[Xe]4f ¹⁰ 6s ²		[Xe]4f ¹¹ 6s ²		[Xe]4f ¹¹ 6s ²		[Xe]4f ¹² 6s ²		[Xe]4f ¹² 6s ²	
90	232.0381	91	231.0359	92	238.0289	93	(237)	94	(244)	95	(243)	96	(247)	97	(247)	98	(251)	99	(252)	100	(257)	101	(258)	102	(259)	103	(262)
Th	11.72	Pa	15.4	U	19.84	Np		Pu	14.49	Am	13.5	Cm	14	Bk	11.70	Cf	11.30	Es	18.00	Fm	11.00	Md	11.00	No	18.00	Lr	
[Rn]7s ²		[Rn]5f ¹ 6d ¹ 7s ²		[Rn]5f ³ 6d ¹ 7s ²		[Rn]5f ⁴ 6d ¹ 7s ²		[Rn]5f ⁶ 7s ²		[Rn]5f ⁷ 7s ²		[Rn]5f ⁷ 6d ¹ 7s ²		[Rn]5f ⁹ 7s ²		[Rn]5f ¹⁰ 7s ²		[Rn]5f ¹⁰ 7s ²		[Rn]5f ¹¹ 7s ²		[Rn]5f ¹¹ 7s ²		[Rn]5f ¹² 7s ²		[Rn]5f ¹² 7s ²	

NOTES:
 (1) Black - solid.
 Red - gas.
 Blue - liquid.
 Outline - synthetically prepared.
 (2) Based upon carbon-12. () indicates most stable or best known isotope.
 (3) Entries marked with daggers refer to the gaseous state at 273 K and 1 atm and are given in units of g.

The A & B subgroup designations, are those recommended by the International Union of Pure and Applied Chemistry.

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