List of radioactive nuclides by half-life

This is a **list of radioactive nuclides** (sometimes also called isotopes), ordered by half-life from shortest to longest, in seconds, minutes, hours, days, and years. Current methods make it difficult to measure half-lives between approximately 10^{-19} and 10^{-10} seconds.[1]

Contents

10^{-24} seconds (yoctoseconds)

isotope	half-life 10^{-24} seconds
hydrogen-7	23
lithium-4	75.6
hydrogen-5	>91
hydrogen-4	139
nitrogen-10	200
hydrogen-6	290
lithium-5	304
boron-7	350
fluorine-14	500
nitrogen-11	590
nitrogen-11m	690
helium-5	700

10^{-21} seconds (zeptoseconds)

isotope	half-life 10^{-21} seconds
fluorine-15	1.11
oxygen-12	1.14
sodium-18	1.34
helium-10	1.52
lithium-10	2
carbon-8	2
beryllium-13	2.7
helium-7	2.51
neon-16	3.74
beryllium-6	5
helium-9	7
fluorine-16	11
boron-9	845

10^{-18} seconds (attoseconds)

isotope	half-life 10^{-18} seconds
beryllium-8	81.9

10^{-15} seconds (femtoseconds)

isotope	half-life 10^{-15} seconds
oxygen-27	1.75

10^{-12} seconds (picoseconds)

isotope	half-life 10^{-12} seconds
boron-16	≤190

10^{-9} seconds (nanoseconds)

isotope	half-life 10^{-9} seconds
lithium-12	<10
boron-18	26
carbon-21	30
fluorine-28	40
oxygen-26	40
sodium-19	40
oxygen-25	50
nitrogen-24	52
protactinium-219	53
neon-34	60
sodium-37	60
protactinium-220m2	69
actinium-217	69
francium-215	86
lead-196m1	<100
uranium-236m1	100
bismuth-199m2	100
oxygen-28	100
curium-247m2	100.6
actinium-218m	103
francium-214m2	103
bismuth-201m3	105
lead-202m3	107
francium-214m3	108
thorium-218	109
lead-202m2	110
neptunium-238m	112
polonium-205m4	115
bismuth-201m2	118
uranium-236m2	120
lead-203m3	122
bismuth-201m4	124
astatine-213	125
lead-193m2	135
lead-198m2	137
lead-196m3	140
lead-190m1	150

thallium-198m2	150
americium-239m	163
lead-192m1	164
bismuth-199m3	168
neon-33	180
sodium-36	180
curium-242m	180
radium-216	182
plutonium-239m1	193
bismuth-203m2	194
polonium-198m1	200
beryllium-15	200
beryllium-16	200
polonium-202m	>200
polonium-203m2	>200
lead-210m	201
lead-206m2	202
bismuth-197m2	204
polonium-207m1	205
bismuth-197m5	209
lead-198m3	212
lead-205m3	217
polonium-206m1	222
thallium-205m2	235
polonium-211m2	243
radon-214m	245
fluorine-31	250
uranium-239m1	>250
bismuth-197m4	253
fluorine-30	260
nitrogen-25	260
polonium-210m	263
bismuth-197m3	263
lead-204m1	265
astatine-214m1	265
radium-208m	270
lead-196m4	270
radon-214	270

uranium-238m	280
curium-245m	290
thallium-192m2	296
polonium-212	299
protactinium-220m1	308
bismuth-202m2	310
polonium-205m1	310
plutonium-243m	330
thallium-200m2	330
neptunium-222	380
lead-216m	400
astatine-206m	410
protactinium-229m	420
lead-204m3	450
lead-208m	500
bismuth-190m2	>500
curium-244m2	>500
lead-201m2	508
radium-215m3	555
astatine-214	558
berkelium-242m	600
thorium-216m2	615
radon-210m1	644
uranium-221	660
francium-216	700
actinium-217m	740
bismuth-195m2	750
polonium-198m2	750
lead-192m3	756
astatine-214m2	760
protactinium-220	780
uranium-239m2	780
lead-188m2	797
lead-188m1	830
radium-212m2	850
polonium-196m	850
bismuth-189m2	880
plutonium-241m1	880

10^{-6} seconds (microseconds)

isotope	half-life 10^{-6} seconds
lead-196m2	<1
polonium-192m	~1
radon-210m3	1.04
thorium-219	1.05
polonium-206m2	1.05
radon-210m2	1.06
curium-243m	1.08
actinium-218	1.08
lead-192m2	1.1
plutonium-237m2	1.1
lead-197m2	1.15
americium-241m	1.2
radium-215m2	1.39
bismuth-211m	1.4
uranium-222	1.4
radium-217	1.63
neptunium-223	2.15
radium-210m	2.24
radon-215	2.30
bismuth-217m	2.70
polonium-211m3	2.8
radon-209m2	3.0
bismuth-202m1	3.04
polonium-213	3.65
lead-198m1	4.19
protactinium-221	4.9
astatine-210m2	5.66
nobelium-250	5.7
lead-212m	6.0
lead-214m	6.2
bismuth-187m2	7
thorium-229m	7
radium-215m1	7.1
lead-190m3	7.2
plutonium-239m2	7.5
bismuth-206m1	7.7
astatine-205m	7.76

thorium-220	9.7
lead-195m2	10.0
lead-199m2	10.1
radium-212m1	10.9
astatine-196m2	11
actinium-219	11.8
radon-209m1	13.4
polonium-194m	15
francium-217	16.8
uranium-223	21
plutonium-241m2	21
fermium-251m	21.1
curium-249m	23
rutherfordium-254	23
lead-205m1	24.2
neptunium-220	25
lead-190m2	25
radium-218	25.2
lead-189m2	26
curium-247m1	26.3
berkelium-250m1	29
nobelium-253m	31
polonium-186	34
americium-238m	35
nobelium-250m	36
neptunium-224	38
californium-249m	45
radon-216	45
rutherfordium-253	48
bismuth-185m	49
polonium-207m2	49
radium-231m	~53
uranium-219	55
berkelium-251m	58
americium-246m2	73
seaborgium-261m	92
astatine-215	100
astatine-216m	100

protactinium-218	113
lead-206m1	125
thorium-216m1	137
curium-248m	146
neptunium-219	150
astatine-212m2	152
polonium-214	164.3
radon-207m	181
bismuth-207m	182
darmstadtium-270	205
berkelium-250m2	213
darmstadtium-269	230
lead-178	230
copernicium-277	240
thorium-217	240
darmstadtium-273	240
berkelium-249m	300
astatine-216	300
bismuth-187m1	320
nihonium-278	340
hassium-265m	360
fermium-258	370
polonium-188	430
actinium-216	440
actinium-216m	443
astatine-210m1	482
polonium-187m	500
hassium-264	540
radon-217	540
polonium-205m2	645
copernicium-277	690
oganesson-294	690
fermium-241	730
hassium-263	760
fermium-242	800
bismuth-206m2	890
mendelevium-245	900
copernicium-282	910

uranium-224	940

10^{-3} seconds (milliseconds)

isotope	half-life 10^{-3} seconds
francium-218	1.0
bismuth-204m2	1.07
protactinium-217m	1.08
meitnerium-266	1.2
nobelium-258	1.2
uranium-216m	1.31
polonium-187	1.40
nihonium-278	1.4
sodium-35	1.5
radium-215	1.55
darmstadtium-271m	1.7
astatine-191	1.7
thorium-208	1.7
thorium-221	1.73
polonium-215	1.781
hassium-265	1.96
bismuth-185	2
roentgenium-272	2
astatine-191m	2.1
radium-213m	2.1
thorium-222	2.237
uranium-215	2.24
polonium-190	2.46
fluorine-29	2.5
flerovium-284	2.5
bismuth-208m	2.58
radium-202	2.6
boron-19	2.92
seaborgium-258	3
hassium-266	3.02
fermium-244	3.12
protactinium-222	3.2
francium-214m1	3.35
neon-31	3.4
protactinium-217	3.48
neon-32	3.5
darmstadtium-277	3.5

protactinium-211	3.8
lead-179	3.9
roentgenium-278	4
radium-203	4
seaborgium-260	4
uranium-216	4.3
beryllium-14	4.35
lead-180	4.5
radon-196	4.7
fluorine-27	5
bismuth-189m1	5.0
francium-214	5.0
meitnerium-277	5
nobelium-262	5
polonium-189	5
boron-17	5.08
protactinium-223	5.1
americium-223	5.2
sodium-34	5.5
lead-205m2	5.55
neptunium-225	6
uranium-218	6
radon-195	6
radon-195m	6
carbon-22	6.2
meitnerium-270	6.3
rutherfordium-256	6.4
bismuth-184	6.6
thorium-209	7
protactinium-213	7
seaborgium-262	7
neon-30	7.3
protactinium-212	8
sodium-33	8
livermorium-290	8.3
oxygen-13	8.58
lithium-11	8.59
fluorine-26	9.6

bohrium-262m	9.6
bismuth-186m	9.8
boron-15	9.87
darmstadtium-270m	10
radium-219	10
hassium-277	11
nitrogen-12	11
astatine-192	11.5
bohrium-261	11.8
roentgenium-274	12
boron-14	12.5
bismuth-204m1	13.0
livermorium-292	13
bismuth-184m	13
sodium-32	13.2
americium-242m2	14.0
protactinium-215	14
nitrogen-23	14.5
rutherfordium-258	14.7
bismuth-186	14.8
neon-29	14.8
actinium-206m1	15
carbon-20	16
francium-199	16
protactinium-214	17
sodium-31	17
thorium-210	17
boron-13	17.33
radium-220	17.9
neon-28	18.9
livermorium-291	19
radon-213	19.5
actinium-205	20
astatine-196m1	20
rutherfordium-270	20
francium-219	20
meitnerium-275	20
boron-12	20.2

radon-197m	21
rutherfordium-260	21
astatine-193m1	21
californium-238	21.1
beryllium-12	21.49
francium-218m1	22.0
tennessine-293	22
polonium-191	22
francium-200	24
nitrogen-22	24
actinium-206	25
uranium-217	26
actinium-220	26.36
thorium-216	26.8
meitnerium-268	27
astatine-193m2	27
lawrencium-251	27
actinium-208m	28
astatine-193	28
sodium-28	30.5
actinium-207	31
neon-27	32
bismuth-187	32
polonium-192	32.2
astatine-217	32.3
uranium-234m	33.5
curium-244m1	34
bohrium-260	35
radon-218	35
neptunium-226	35
thorium-212	36
moscovium-287	37
seaborgium-264	37
dubnium-255	37
actinium-206m2	41
radium-203m	41
bismuth-188	44
sodium-29	44.9

lead-181	45
carbon-19	46.2
thorium-211	48
sodium-30	48.4
fluorine-25	50
tennessine-294	51
actinium-221	52
hassium-267	55
radium-207m	57
livermorium-293	57
polonium-205m3	57.4
radium-204	60
lead-182	60
uranium-225	61
oxygen-24	65
radon-198	65
radon-197	66
francium-201	67
nihonium-282	73
nihonium-283	75
oxygen-23	82
bohrium-262	84
nitrogen-21	87
astatine-192m	88
darmstadtium-271	90
roentgenium-279	90
carbon-18	92
actinium-209	92
polonium-191m	93
actinium-208	97
copernicium-284	98
thorium-214	100
flerovium-285	100
protactinium-216	105
nobelium-260	106
astatine-204m	108
astatine-212m1	119
helium-8	119

flerovium-286	120
seaborgium-263m	120
bismuth-191m	124
carbon-9	126.5
nitrogen-20	130
thorium-213	140
polonium-216	145
astatine-195m	147
moscovium-288	164
actinium-215	170
lithium-9	178.3
copernicium-281	180
radium-205m	180
plutonium-237m1	180
neon-26	192
carbon-17	193
mendelevium-247m	200
seaborgium-261	200
darmstadtium-279	210
actinium-211	213
bismuth-188m	220
radium-205	220
fermium-243	231
polonium-193m	240
radium-206	240
astatine-196	253
uranium-226	269
nitrogen-19	271
hassium-266m	280
nobelium-254m	280
astatine-194	286
hassium-275	290
francium-202	290
sodium-27	301
bismuth-203m1	303
astatine-212	314
radon-199m	320
astatine-194m	323

astatine-195	328
moscovium-289	330
francium-202m	340
actinium-210	350
seaborgium-266	360
astatine-197	390
fluorine-24	390
lawrencium-252	390
polonium-194	392
bismuth-200m2	400
mendelevium-245m	400
mendelevium-244	400
lead-183m	415
polonium-193	420
meitnerium-274	440
sodium-20	447.9
meitnerium-276	450
astatine-202m2	460
flerovium-287	480
lead-203m2	480
lead-184	490
hassium-273	510
neptunium-227	510
dubnium-259	510
polonium-211	516
lead-183	535
francium-203	550
lawrencium-253	580
thorium-223	600
bismuth-196m1	600
seaborgium-259	600
neon-25	602
radon-199	620
nitrogen-18	622
lawrencium-257	646
moscovium-290	650
francium-200m	650
flerovium-288	660

dubnium-257m	670
bismuth-189	674
francium-206m2	700
actinium-213	731
carbon-16	747
boron-8	770
nobelium-251	780
lead-207m	806
helium-6	806.7
lithium-8	839.9
protactinium-224	844
bohrium-265	900
bohrium-266	900
lutetium-153	900
nihonium-284	910
actinium-212	920
radon-200	960
bohrium-264	970

10^0 seconds

isotope	half-life seconds
seaborgium-263	1
astatine-198m	1.0
mendelevium-246	1.0
thorium-224	1.05
sodium-26	1.077
plutonium-228	1.1
mendelevium-247	1.12
curium-246m	1.12
bohrium-271	1.2
thorium-215	1.2
radium-208	1.3
radium-207	1.3
rutherfordium-268	1.4
hassium-268	1.42
polonium-217	1.47
astatine-218	1.5
lawrencium-253m	1.5
fermium-259	1.5
dubnium-260	1.52
dubnium-257	1.53
fermium-246	1.54
neon-18	1.672
francium-204	1.7
francium-204m2	1.7
nobelium-251m	1.7
protactinium-225	1.7
americium-229	1.8
flerovium-289	1.9
dubnium-256	1.9
mendelevium-249m	1.9
dubnium-258m	1.9
polonium-195m	1.92
fermium-250m	1.92
astatine-197m	2.0
californium-237	2.1
fluorine-23	2.23
oxygen-22	2.25

nobelium-252	2.27
rutherfordium-255	2.3
rutherfordium-262	2.3
carbon-15	2.449
radium-214	2.46
rutherfordium-259m	2.5
francium-204m1	2.6
flerovium-289	2.6
radium-213	2.74
polonium-207m3	2.79
nobelium-256	2.91
bismuth-193m	3.2
rutherfordium-259	3.2
oxygen-21	3.42
astatine-200m2	3.5
radium-210	3.7
francium-205	3.80
radon-201m	3.8
radon-219	3.96
rutherfordium-261m	4
lead-185m	4.07
rutherfordium-257m	4.1
lawrencium-258	4.1
fluorine-21	4.158
nitrogen-17	4.173
copernicium-283	4.2
astatine-198	4.2
nihonium-285	4.2
fermium-245	4.2
fluorine-22	4.23
meitnerium-278	4.5
dubnium-258	4.5
dubnium-261	4.5
roentgenium-280	4.6
radium-209	4.6
polonium-195	4.64
rutherfordium-257	4.7
lead-186	4.82

actinium-222	5.0
francium-232	5
polonium-196	5.56
einsteinium-240	6
lawrencium-259	6.2
bismuth-190m1	6.2
lead-203m1	6.21
bismuth-190	6.3
lead-185	6.3
astatine-199	6.92
radon-201	7.0
mendelevium-248	7
nitrogen-16	7.13
bismuth-198m2	7.7
seaborgium-265	8
actinium-214	8.2
bismuth-219	8.7
hassium-270	9
bismuth-220	9.5
nihonium-286	9.5
bohrium-272	9.8
radon-202	9.94
hassium-271	10
einsteinium-241	10
fluorine-20	11.07
radon-229	12
bismuth-191	12.3
darmstadtium-281	12.7
radium-212	13.0
radium-211	13
lawrencium-254	13
einsteinium-242	13.5
oxygen-20	13.51
beryllium-11	13.81
francium-207	14.8
lead-218	15
lead-187	15.2
francium-206m1	15.9

francium-206	16
hassium-269	16
seaborgium-265m	16.2
bohrium-267	17
roentgenium-281	17
neon-19	17.22
francium-231	17.6
lead-187m	18.3
berkelium-234	19
francium-230	19.1
carbon-10	19.29
lead-217	20
radon-227	20.8
einsteinium-243	21
berkelium-233	21
berkelium-236	22
lawrencium-255	22
sodium-21	22.49
rutherfordium-266	23
mendelevium-249	24
nobelium-257	25
polonium-211m1	25.2
lead-188	25.5
polonium-197m	25.8
oxygen-19	26.464
radon-203m	26.7
curium-233	27
lawrencium-256	27
francium-220	27.4
copernicium-285	28
radium-221	28
dubnium-263	29
radium-234	30
radium-233	30
fermium-247	31
americium-230	32
bismuth-218	33
bismuth-192	34.6

francium-213		34.6
dubnium-262		35
fermium-248		35.1
bismuth-215m		36.9
einsteinium-244		37
neon-23		37.24
radium-222		38.0
francium-228		38
bismuth-192m		39.6
polonium-220		40
bohrium-274		40
astatine-200		43.2
actinium-234		44
radon-203		44.2
polonium-203m1		45
polonium-212m		45.1
astatine-200m1		47
francium-226		49
francium-209		50.0
astatine-223		50
francium-229		50.2
lead-189m1		50.5
nobelium-254		51
lead-189		51
curium-234		52
mendelevium-250		52
polonium-197		53.6
astatine-222		54
radon-220		55.6
astatine-219		56
francium-208		59.1
sodium-25		59.1
	minutes	**seconds**
californium-239	1.0	60
actinium-235	1.0	60
lead-201m1	1.02	61
bohrium-270	1.02	61
neptunium-228	1.023	61.4

actinium-222m	1.05	63
californium-240	1.06	64
fluorine-17	1.0748	64.49
radon-228	1.08	65
rutherfordium-263	1.1	66
uranium-227	1.1	66
einsteinium-245	1.1	66
bismuth-193	1.12	67
radon-204	1.17	70
protactinium-234m	1.17	70
oxygen-14	1.1770	70.62
lead-190	1.18	71
actinium-236	1.20	72
rutherfordium-261	1.30	78
americium-232	1.32	79
lead-191	1.33	80
seaborgium-267	1.4	84
astatine-201	1.42	85
bismuth-195m1	1.45	87
bismuth-194	1.58	95
fermium-249	1.6	96
nobelium-253	1.62	97
bismuth-217	1.642	98.5
lead-216	1.65	99
roentgenium-282	1.7	100
plutonium-230	1.70	102
radium-231	1.72	103
polonium-198	1.77	106
protactinium-226	1.8	110
berkelium-252	1.8	110
neptunium-243	1.85	111
bismuth-194m2	1.92	115
actinium-232	1.98	119
protactinium-240	2	120
plutonium-229	2.0	120
actinium-230	2.03	122
oxygen-15	2.0373	122.24
bismuth-194m1	2.08	125

actinium-223	2.10	126
bismuth-211	2.14	128
bismuth-216	2.17	130
lead-191m	2.18	131
polonium-221	2.2	130
neptunium-242	2.2	130
protactinium-238	2.27	136
neptunium-244	2.29	137
mendelevium-252	2.30	138
astatine-221	2.3	140
americium-234	2.32	139
lead-215	2.34	140
berkelium-238	2.40	144
seaborgium-271	2.4	140
actinium-233	2.42	145
francium-227	2.47	148
astatine-224	2.5	150
lawrencium-260	2.7	160
radon-205	2.8	170
astatine-202m1	3.03	182
bismuth-195	3.05	183
astatine-202	3.07	184
polonium-218	3.10	186
francium-211	3.10	186
nobelium-255	3.1	190
francium-210	3.18	191
americium-233	3.2	190
francium-224	3.33	200
neon-24	3.38	203
californium-242	3.49	209
lead-192	3.5	210
americium-236	3.6	220
astatine-220	3.71	223
californium-241	3.78	227
radium-229	4.0	240
mendelevium-251	4.0	240
francium-225	4.0	240
neptunium-229	4.0	240

bismuth-196m2	4.00	240
radium-232	4.2	250
polonium-199m	4.17	250
einsteinium-247	4.55	273
berkelium-241	4.6	280
neptunium-230	4.6	280
radon-225	4.66	280
berkelium-240	4.8	290
thorium-237	4.8	290
francium-221	4.9	290
curium-235	5	300
lead-193	5	300
bismuth-197m1	5.04	302
bismuth-196	5.1	310
polonium-199	5.48	329
neptunium-242m	5.5	330
radon-206	5.67	340
lead-193m1	5.8	350
bismuth-216m	6.6	400
curium-236	6.8	410
berkelium-242	7.0	420
bismuth-212m2	7.0	420
thorium-235	7.2	430
neptunium-240m	7.22	433
astatine-203	7.37	442
radon-226	7.4	440
actinium-231	7.5	450
bismuth-215	7.6	460
einsteinium-246	7.7	460
lead-197	8.1	490
plutonium-231	8.6	520
protactinium-237	8.7	520
thorium-225	8.72	523
polonium-201m	8.9	530
protactinium-236	9.1	550
polonium-222	9.1	550
uranium-228	9.1	550
astatine-204	9.2	550

radon-207	9.25	555
bismuth-197	9.33	560
thorium-238	9.4	560
copper-62	9.673	580.4
americium-235	9.9	590
nitrogen-13	9.965	597.9
berkelium-253	10	600
mercury-210[2]	10	600
mendelevium-254	10	600
lead-213	10.2	610
bismuth-198	10.3	620
polonium-219	10.3	620
californium-243	10.7	640
polonium-200	11.5	690
bismuth-198m1	11.6	700
lead-194	12.0	720
mendelevium-253	12	720
lead-199m1	12.2	730
californium-256	12.3	740
neptunium-241	13.9	830
seaborgium-269	14	840
francium-222	14.2	850
[free] neutron, $^{1}_{0}n$	14.692	881.5
neptunium-232	14.7	880
lead-195m1	15.0	900
rutherfordium-263	15	900
lead-195	~15	~900
polonium-201	15.3	920

10^3 seconds (kiloseconds)

isotope	half-life	
	minutes	10^3 seconds
curium-251	16.8	1.01
uranium-242	16.8	1.01
californium-244	19.4	1.16
bismuth-214	19.9	1.19
francium-212	20.0	1.20
curium-237	20	1.2
carbon-11	20.334	1.2200
plutonium-233	20.9	1.25
thorium-233	21.83	1.310
francium-223	22.00	1.320
americium-247	23.0	1.38
uranium-239	23.45	1.407
radon-212	23.9	1.43
radon-223	24.3	1.46
radon-208	24.35	1.461
protactinium-235	24.44	1.466
bismuth-199m1	24.70	1.482
bismuth-212m1	25.0	1.50
americium-246m1	25.0	1.50
plutonium-235	25.3	1.52
einsteinium-256	25.4	1.52
radon-221	25.7	1.54
americium-244m	26	1.6
uranium-235m	26	1.6
astatine-205	26.2	1.57
lead-214	26.8	1.61
mendelevium-255	27	1.6
bismuth-199	27	1.6
einsteinium-248	27	1.6
mendelevium-254m	28	1.7
radon-209	28.5	1.71
fermium-250	30.4	1.82
thorium-226	30.57	1.834
astatine-206	30.6	1.84
bismuth-200m1	31	1.9
plutonium-232	33.7	2.02

lead-211	36.1	2.17
neptunium-233	36.2	2.17
bismuth-200	36.4	2.18
polonium-203	36.7	2.20
lead-196	37	2.2
thorium-236	37.5	2.25
protactinium-227	38.3	2.30
americium-246	39	2.3
radium-227	42.2	2.53
lead-197m1	42.9	2.57
lawrencium-261	44	2.6
polonium-202	44.7	2.68
californium-245	45.0	2.70
bismuth-213	45.59	2.735
neptunium-231	48.8	2.93
berkelium-251	55.6	3.34
mendelevium-258m	57.0	3.42
uranium-229	58	3.5
nobelium-259	58	3.5
bismuth-201m1	59.1	3.55
	hours	**10^3 seconds**
dubnium-270	1.0	3.6
bismuth-212	1.0092	3.633
neptunium-240	1.032	3.72
actinium-229	1.045	3.76
curium-249	1.0692	3.849
lead-204m2	1.12	4.0
gallium-68	1.1285	4.063
americium-237	1.22	4.4
mendelevium-256	1.283	4.62
rutherfordium-267	1.3	4.7
dubnium-266	1.33	4.8
californium-255	1.417	5.10
lead-199	1.50	5.4
radium-230	1.55	5.6
mendelevium-259	1.60	5.8
americium-238	1.63	5.9
astatine-208	1.63	5.9

polonium-205	1.66	6.0
einsteinium-249	1.703	6.13
bismuth-202	1.72	6.2
astatine-207	1.80	6.5
bismuth-201	1.80	6.5
protactinium-239	1.8	6.5
fluorine-18	1.8295	6.586
americium-245	2.05	7.4
einsteinium-250m	2.22	8.0
radon-210	2.4	8.6
lead-198	2.4	8.6
curium-238	2.4	8.6
curium-239	2.5	9.0
fermium-256	2.627	9.46
actinium-224	2.78	10.0
californium-247	3.11	11.2
berkelium-250	3.212	11.56
fermium-254	3.240	11.66
lead-209	3.253	11.71
lead-202m1	3.53	12.7
polonium-204	3.53	12.7
lawrencium-262	3.6	13
berkelium-244	4.35	15.7
berkelium-243	4.5	16
dubnium-267	4.6	17
plutonium-243	4.956	17.84
fermium-251	5.30	19.1
polonium-207	5.80	20.9
astatine-209	5.41	19.5
mendelevium-257	5.52	19.9
actinium-228	6.13	22.1
protactinium-234	6.70	24.1
astatine-211	7.214	25.97
einsteinium-256m	7.6	27
astatine-210	8.1	29
einsteinium-250	8.6	31
plutonium-234	8.8	32
lead-201	9.33	33.6

americium-244	10.1	36
erbium-165	10.36	37.3
plutonium-245	10.5	38
lead-212	10.64	38.3
lawrencium-266	11	40
bismuth-204	11.22	40.4
bismuth-203	11.76	42.3
americium-239	11.9	43
uranium-240	14.1	51
radon-211	14.6	53
sodium-24	14.96	53.9
americium-242	16.02	57.7
fermium-255	20.07	72.3
lead-200	21.5	77
protactinium-228	22	79
neptunium-236m	22.5	81
berkelium-248m	23.7	85
	days	**10^3 seconds**
fermium-252	1.058	91.4
thorium-231	1.0634	91.88
dubnium-268	1.283	110.9
erbium-160	1.191	102.9
actinium-226	1.2238	105.74
protactinium-232	1.31	113
einsteinium-251	1.375	118.8
californium-246	1.4875	128.52
protactinium-229	1.50	130
einsteinium-255	1.6375	141.48
berkelium-246	1.80	156
neptunium-238	2.117	182.9
americium-240	2.117	182.9
lead-203	2.16138	186.743
plutonium-247	2.27	196
neptunium-239	2.356	203.6
gold-198	2.695	232.8
fermium-253	3.00	259
gold-199	3.169	273.8
radium-224	3.6319	313.80

radon-222	3.8235	330.35
uranium-231	4.2	360
neptunium-234	4.4	380
calcium-47	4.536	391.9
berkelium-245	4.94	427
bismuth-210	5.012	433.0
manganese-52	5.591	483.1
gold-196	6.183	534.2
bismuth-206	6.243	539.4
uranium-237	6.75	583
einsteinium-257	7.7	670
iodine-131	8.02	693
polonium-206	8.8	760
thulium-167	9.25	799
actinium-225	10.0	860
plutonium-246	10.84	937
radium-223	11.43	988

10^6 seconds (megaseconds)

isotope	half-life	
	days	10^6 seconds
phosphorus-32	14.29	1.235
radium-225	14.9	1.29
bismuth-205	15.31	1.323
vanadium-48	15.9735	1.38011
protactinium-230	17.4	1.50
californium-253	17.81	1.539
thorium-227	18.68	1.614
einsteinium-253	20.47	1.769
uranium-230	20.8	1.80
thorium-234	24.10	2.082
protactinium-233	26.975	2.3306
curium-240	27	2.3
chromium-51	27.7025	2.39350
mendelevium-260	27.8	2.40
curium-241	32.8	2.83
einsteinium-255	39.8	3.44
plutonium-237	45.2	3.91
mendelevium-258	51.5	4.45
beryllium-7	53.12	4.590
californium-254	60.5	5.23
cobalt-56	77.27	6.676
scandium-46	83.79	7.239
sulfur-35	87.32	7.544
thulium-168	93.1	8.04
fermium-257	100.5	8.68
thulium-170	128.6	11.11
polonium-210	138.376	11.9557
calcium-45	162.7	14.06
curium-242	162.8	14.07
gold-195	186.1	16.08
zinc-65	243.7	21.06
cobalt-57	271.79	23.483
einsteinium-254	275.7	23.82
vanadium-49	330	29
berkelium-249	330	29
californium-248	333.5	28.81

	years	10^6 seconds
ruthenium-106	1.023	32.3
neptunium-235	1.0845	34.22
cadmium-109	1.267	40.0
einsteinium-252	1.2915	40.76
thorium-228	1.9116	60.33
thulium-171	1.92	61
caesium-134	2.0652	65.17
sodium-22	2.602	82.1
californium-252	2.645	83.5
iron-55	2.756	87.0
plutonium-236	2.858	90.2
polonium-208	2.898	0.2504
rhodium-101	3.3	100
cobalt-60	5.2714	166.35
radium-228	5.75	181
krypton-85	10.756	339.4
hydrogen-3 (also known as tritium)	12.32	389
californium-250	13.08	413
plutonium-241	14.290	451.0
niobium-93m	16.13	509
curium-244	18.10	571
actinium-227	21.772	687.1
lead-210	22.3	700
strontium-90	28.79	909
curium-243	29.1	920
caesium-137	30.17	952

10^9 seconds (gigaseconds)

isotope	half-life	
	years	10^9 seconds
bismuth-207	32.9	1.04
titanium-44	63	2.0
uranium-232	68.9	2.17
plutonium-238	87.7	2.77
samarium-151	96.6	3.05
nickel-63	100.1	3.16
polonium-209	125.2	3.95
americium-242m1	141	4.4
silicon-32	170	5.4
argon-39	269	8.5
berkelium-248	>300	>9.5
californium-249	351	11.1
silver-108m	418	13.2
americium-241	432.2	13.64
mercury-194	444	14.0
niobium-91	680	21
californium-251	900	28
holmium-166m1	1,200	38
berkelium-247	1,380	44
radium-226	1,600	50
molybdenum-93	4,000	130
holmium-163	4,570	144
curium-246	4,760	150
carbon-14[3]	5,730	181
plutonium-240	6,561	207.0
thorium-229	7,340	232
americium-243	7,370	233
curium-250	8,300	260
curium-245	8,500	270
niobium-94	20,300	640
plutonium-239	24,110	761

10^{12} seconds (teraseconds)

isotope	half-life	
	millennia	10^{12} seconds
protactinium-231	32.76	1.034
lead-202	52.5	1.66
lanthanum-137	60	1.9
thorium-230	75.38	2.379
nickel-59	76	2.4
calcium-41	103	3.3
neptunium-236	154	4.9
uranium-233	159.2	5.02
rhenium-186m	200	6.3
technetium-99	211.1	6.66
krypton-81	229	7.2
tin-126	230	7.3
uranium-234	245.5	7.75
chlorine-36	301	9.5
curium-248	348	11.0
bismuth-208	368	11.6
plutonium-242	375	11.8
aluminium-26	717	22.6
	10^{6} years	10^{12} seconds
selenium-79	1.13	36
beryllium-10	1.51	48
zirconium-93	1.53	48
gadolinium-150	1.79	56
neptunium-237	2.144	67.7
caesium-135	2.3	73
iron-60	2.6	82
technetium-97	2.6	82
dysprosium-154	3.0	95
bismuth-210m	3.04	96
manganese-53	3.7	120
technetium-98	4.2	130
palladium-107	6.5	210
hafnium-182	8.9	280
lead-205	17.3	550
curium-247	15.6	490
iodine-129	15.7	500

uranium-236	23.42	739

10^{15} seconds (petaseconds)

isotope	half-life	
	10^{6} years	**10^{15} seconds**
niobium-92	34.7	1.10
samarium-146	68	2.1
plutonium-244	80	2.5
uranium-235	703.8	22.21
	10^{9} years	**10^{15} seconds**
potassium-40	1.251	39.5
uranium-238	4.468	141.0
thorium-232	14.05	443

10^{18} seconds (exaseconds)

isotope	half-life	
	10^{9} years	**10^{18} seconds**
lutetium-176	37.64	1.188
rhenium-187	41.22	1.301
rubidium-87	49.72	1.569
lanthanum-138	102.1	3.22
samarium-147	106.1	3.35
platinum-190	650	21

10^{21} seconds (zettaseconds)

isotope	half-life	
	10^{12} years	**10^{21} seconds**
gadolinium-152	110	3.5
indium-115	440	14
	10^{15} years	**10^{21} seconds**
hafnium-174	2.002	63.2
osmium-186	2.002	63.2
neodymium-144	2.292	72.3
samarium-148	7.005	221.1
cadmium-113	7.7	240

10^{24} seconds (yottaseconds)

isotope	half-life	
	10^{15} years	**10^{24} seconds**
vanadium-50	140	4.4
	10^{18} years	**10^{24} seconds**
tungsten-180	1.801	56.8
europium-151	5.004	157.9
molybdenum-100	7.804	246.3
neodymium-150	7.905	249.5
tellurium-130	8.806	277.9
zirconium-96	20	630
bismuth-209	20.1	630
calcium-48	23.01	726
cadmium-116	31.02	979

10^{27} seconds

isotope	half-life	
	10^{18} years	**10^{27} seconds**
selenium-82	110	3.5
	10^{21} years	**10^{27} seconds**
barium-130	1.2	38
germanium-76	1.8	57
xenon-136	2.165	68.3
krypton-78	9.2	290
xenon-124	18	570

10^{30} seconds

isotope	half-life	
	10^{24} years	**10^{30} seconds**
tellurium-128	2.2	69

Tellurium-128's half-life is over 160 trillion times greater than the age of the universe.[4]

See also

- List of elements by stability of isotopes
- List of nuclides

- Orders of magnitude (time)
- Lists of isotopes, by element

Notes

1. Reaching the limits of nuclear stability, M. Thoennessen, Rep. Prog. Phys. **67** (2004), pp. 1187–1232, §2.3, doi:10.1088/0034-4885/67/7/R04 (https://doi.org/10.1088%2F0034-4885%2F67%2F7%2FR04).
2. https://ptable.com/#Isotope
3. ^{14}C is used in radiocarbon dating.
4. Walker, John. "Barely Radioactive Elements" (https://www.fourmilab.ch/documents/barely_radioactive/). *www.fourmilab.ch*. Retrieved 2018-03-09.

External links

- Radioactive isotope table (http://www.astro.caltech.edu/~dperley/public/isotopetable.html) "lists ALL radioactive nuclei with a half-life greater than 1000 years", incorporated in the list above.