JAERI-Data/Code
98-008

NATURAL BACKGROUND GAMMA-RAY SPECTRUM LIST OF GAMMA-RAYS ORDERED IN ENERGY FROM NATURAL RADIONUCLIDES

March 1998

Tsutomu ICHIMIYA,* Tsutomu NARITA and Kensuke KITAO**

日本原子力研究所
Japan Atomic Energy Research Institute

本レポートは，日本原子力研究所が不定期に公刊している研究報告書です。
入手の問合わせは，日本原子力研究所研究情報部研究情報課（〒319-1195　茨城県那珂郡東海村）あて，お申し越しください。なお，このほかに財団法人原子力弘済会資料センター〒319-1195　茨城県那珂郡東海村日本原子力研究所内）で複写による実費領布をおこなっております。

This report is issued irregularly.
Inquiries about availability of the reports should be addressed to Research Information Division, Department of Intellectual Resources, Japan Atomic Energy Research Institure, Tokai-mura, Naka-gun, Ibaraki-ken 319-1195, Japan.

編集兼発行　日本原子力研究所
印　　刷　㈱原子力資料サービス

JAERI−Data/Code 98−008

Natural Background Gamma-ray Spectrum
— List of Gamma-rays Ordered in Energy from Natural Radionuclides —

Tsutomu ICHIMIYA*, Tsutomu NARITA and Kensuke KITAO**

Department of Reactor Engineering
Tokai Research Establishment
Japan Atomic Energy Research Institute
Tokai-mura, Naka-gun, Ibaraki-ken

(Received January 27, 1998)

A quick index to γ-rays and X-rays from natural radionuclides is presented. In the list, γ-rays are arranged in order of increasing energy. The list also contains γ-rays from radioactive nuclides produced in a germanium detector and its surrounding materials by interaction with cosmic neutrons, as well as direct γ-rays from interaction with the neutrons. Artificial radioactive nuclides emitting γ-rays with same or near energy value as that of the natural γ-rays and X-rays are also listed. In appendix, γ-ray spectra from a rock, uranium ore, thorium, monazite and uraninite and also background spectra obtained with germanium detectors placed in iron or lead shield have been given. The list is designed for use in γ-ray spectroscopy under the conditions of highly natural background, such as in-situ environmental radiation monitoring or low-level activity measurements, with a germanium detector.

Keywords: Gamma-rays, Natural Background Radiation, Natural Radioactive Nuclides, Artificial Radioactive Nuclides, Gamma-ray Spectrometry, Environmental Radiation Monitoring.

---

* The Japan Radioisotope Association

** Data Engineering, Inc

JAERI－Data/Code 98－008

自然バックグラウンドγ線スペクトル
—— エネルギー順に並べた自然放射性核種からのγ線表 ——

日本原子力研究所東海研究所原子炉工学部
一宮 勉*・成田 孟・喜多尾憲助**

（１９９８年１月２７日受理）

この表は、自然放射性核種からのγ線をエネルギー順に並べたものであって，自然バックグラウンドγ線の同定，あるいは人工放射性核種からのγ線の同定に役立つ早見表である。これら核種の壊変に伴う特性X線もあわせて並べてある。また宇宙線中性子と、検出器自身や検出器の周辺にある物質との相互作用による直接γ線や，相互作用の結果生成した放射性核種の放出するγ線のうち，放出の割合の大きいものをこの表に含めた。 さらに、これらγ線とほぼ等しいエネルギー値のγ線を放出する人工放射性核種を併記した。なお自然石，ウラン鉱石，トリウム及びモナズ石からのγ線スペクトル，遮へい体内に置かれたゲルマニウム検出器のバックグラウンド・スペクトルの例を付録として掲げた。

東海研究所：319-1195　茨城県那珂郡東海村白方白根 2-4
*　（社）日本アイソトープ協会
**　（株）データ工学

Contents

目　　次

1. Introduction

In in-situ gamma-ray measurements for environmental radiation monitoring or in gamma-ray measurements for low-level radioactive samples, spectral lines from background gamma-rays may mask weak lines of gamma-rays emitted from artificial radioactive nuclides. Although germanium detectors have excellent energy-resolution, it is very difficult to identify such weak lines in a gamma-ray spectrum. This list is designed as a convenient tool to identify background gamma-rays, while identifying weak gamma-rays from artificial radionuclides, in a gamma-ray spectrum obtained with a germanium detector.

Background peaks observed in a gamma-ray spectrum are not only those formed by gamma-rays from natural radioactive nuclides, but also from radioactive nuclides produced in the detector and its surrounding materials by interaction with the cosmic radiation, as well as from direct interaction with the cosmic radiation.[1) 2) 3) 4)] These gamma-rays are listed together with characteristic X-rays following the decay of natural radionuclides in the table.

Artificial radioactive nuclides to emit a γ -ray with same or near energy value as that of the listed γ - and X-ray are also given in the same line of the table. Selection of these corresponding artificial nuclides is based on a list of strong gamma-rays from radioactive nuclide provided by authors, previously.[5) 6)]

Furthermore, γ -ray spectra obtained from a rock, uranium ore, thorium, monazite, and uraninite with a germanium detector, and also background spectra obtained by shielded detectors with iron or lead have been shown in appendix B.

Authors wish to use this table not only in environmental radiation monitoring, but also in field of research on natural radioactivity.

2. Data source

All energies and their intensities of γ -rays given in this table are those retrieved from Evaluated Nuclear Structure Data File (ENSDF, file as September 1997) maintained by National Nuclear Data Center at Brookhaven National Laboratory, USA, on behalf of the International Network for Nuclear Structure and Decay Data evaluation.[7)]

Energies of characteristic X-rays are those from Table of Isotopes.[8)]

3. Gamma-ray emitters and interactions

Gamma-rays listed are those from radionuclides and interactions as follows.

3.1 Natural radionuclides (see Appendix A.)

Nuclides belong to the thorium, 4n, series.

Nuclides belong to the uranium, 4n+2, series.

Nuclides belong to the actinium, 4n+3, series.

Natural radionuclide not belong to any natural series:

^{40}K (EC, β^-)

^{50}V (EC, β^-)

^{138}La (EC, β^-)

^{176}Lu(β^-)

3.2 Nuclides produced by the cosmic radiation in terrestrial environment:

^{7}Be (EC)

^{22}Na (EC)

^{28}Al (β^-)

3.3 Nuclides produced by radiative capture and inelastic scattering with the cosmic neutrons in germanium crystal.

^{71m}Ge (IT)

^{73m}Ge (IT)

^{75m}Ge (IT, β^-)

^{77m}Ge (IT, β^-)

Reaction products from(n, α) , (n,p), (n,2n), (n,xnyp), and (p,xnyp) reactions are not listed.

3.4 Reaction and inelastic scattering:

^{1}H(n, γ)

^{19}F(n,n' γ)

^{56,57}Fe(n,n' γ)

^{56}Fe(n, γ)

^{63,65}Cu(n,n' γ)

^{63,65}Cu(n, γ)

^{70,72,74,76}Ge(n,n' γ)

^{70,73}Ge(n, γ)

^{110,111,112,113,114}Cd(n,n' γ)

^{113}Cd(n, γ)

^{116,117,118,120}Sn(n,n' γ)

^{115,117,119}Sn(n, γ)

^{204}Pb(n, γ)

^{206,207,208}Pb(n,n' γ)

Acknowledgement

Authors wish to thank to Drs. M. Noguchi, M. Matsui, R. Ozaki and T. Koshijima for permission to use the gamma-ray spectrum measured by them.

References

1) A. K. Entwistle, C. S. Dyer, J. J. Quenby, A. J. Evans and M. Joshi: J. Phys. E:Instrum. 22, 601-611(1989)
2) R. M. Lindstrom, D. J. Lindstrom, L. A. Slaback and J. K. Langland: Nucl. Instr. Meth. A299, 425-429(1990)
3) G. Heusser: Nucl. Instr. Meth. A369, 539-543(1996)
4) R. Wordel, D.Mouchel, T. Altzitzoglou, G. Heusser, B. Quintana Arnes and P. Meynendonckx: Nucl. Instr. Meth. A369, 557-562(1996)
5) T. Ichimiya, T. Narita and K. Kitao: Radioisotopes, 45, 320-348 (1996); ibid 45, 378-405 (1996), and ibid 45, 446-475 (1996).
6) T. Ichimiya, T. Narita and K. Kitao: Private communications (1997)
7) Evaluated Nuclear Structure Data File (ENSDF)- A computer file of evaluated experimental nuclear structure data maintained by National Nuclear Data Center,
Brookhaven National Laboratory (File as of September 1997)
8) R.B.Firestone and V. S. Shirley (Ed.): Table of Isotopes, 8th edition, John Wiley & Sons, Inc. (1996).

List of gamma-rays from natural radionuclides

Explanation of the table.

1. Col. 1 "Energy"

Energy of gamma-rays and X-rays in keV, except for 691.43 keV, that is the transition energy. Gamma-rays at 2103.5 and 1592.5 keV are single and double escape peak of the 2614.53 keV γ-ray, respectively. See section 3 for energy values of X-rays.

2. Col.2 "Intensity"

Photons per 100 decays of the parent nuclides in equilibrium with its daughter nuclides. For nuclide to belong to no any decay chain, photons per 100 decays of the nuclide in col. 3.

3 Col.3 "Nuclide"

Parent nuclide emitting the γ-ray of col.1 unless otherwise noted. The nuclide is indicated with a chemical symbol and a mass number. The letter "m" after the mass number means that the nuclide is an isomer. The letter before the chemical symbol means:

a: belongs to actinium series

t: belongs to thorium series

u: belongs to uranium series

c: produced by interaction with cosmic neutrons or the target nuclide in that interaction.

x: not nuclide, but the characteristic X-ray is given. For example, Bi Ka1 is $K\alpha_1$ X-rays of Bi. Kb1, La, Lb, and Lg are as follows:

Kb1 : $K\beta_1+K\beta_3$ X-ray

La : $L\alpha_1+L\alpha_2$ X-ray

Lb : $L\beta_1+L\beta_{2,15}$ X-ray

Lg : $L\gamma_1$ X-ray

Values of energies of these X-rays are those obtained by a weighted average of each components.

4 Col. 4 "Decay mode"

Mode of decay of nuclide or type of interaction emitting γ-rays in col. 1. Symbols using in this column:

A: α decay

B-: β^- decay

EC: Electron capture and β^+ decay

IT: Isomeric decay

NN: (n,n'γ)

NG: (n,γ)

5 Col. 5 "Half life"

Half-life of the nuclide in col.3. Units and their symbols using in this column:

US: Microsecond

MS: Millisecond

S: Second

M: Minute

H: Hour

D: Day

Y: Year

6 Col. 6 "Relational artificial radionuclides"

Artificial radionuclides emitting the γ-ray with energy value equal or near to that in col.1 are listed. The nuclides are shown with a chemical symbol and a mass number. The letter "m" after the mass number indicates that the nuclide is the isomer, and "m1" for the first (low energy) isomer and "m2" for the second isomer. Symbol "gm" indicates that the artificial nuclide has two decay modes, ground-state decay and metastable state decay, and emits their γ-ray corresponding to one in col.1.

7 Other symbols using in the table.

= Approximately equal to

> Greater or equal to

< Less than or equal to

-- Not reported, or reported in ENSDF but not given here

Energy 4.4 ～ 15.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
4.4	--	a Ra-223	A	11.435 D	Hf-181	Ba-146	At-208	Lu-167	
4.47	--	x Ba La							
4.5	--	x Ti Ka2							
4.51	--	x Ti Ka1			Po-204				
4.93	--	x Ti Kb			Pb-203m1	Se- 86	Po-204		
6.28	1.4E-06	t Ra-228	B-	5.75 Y	Tl-201	W -181	Bi-204		
6.3	--	a Th-227	A	18.72 D	In-121	Sn-121m	Hf-181		
6.67	3.1E-05	t Ra-228	B-	5.75 Y	Er-159	Po-201m	Br- 75	Ag-104m	Sr- 85m
					Eu-154m	Er-160			
7.98	--	x Hf La			W -179m	Sm-153m	Es-254		
8.2	--	a Th-227	A	18.72 D	Th-233	Fm-251	Er-169	Eu-154m	
9.03	--	x Hf Lb			W -179m	At-200m2	At-200m1		
9.2	0.5	a Th-231	B-	25.52 H	U -231				
9.3	--	a Ac-227	B-	21.773 Y	Ag-102m	Eu-154m	Mo-101	Eu-157	
9.5	--	u Pb-214	B-	26.8 M	Kr- 83m	Po-204			
9.98	--	x Hg La			Y - 81	Kr- 74			
10.	0.014	a Ra-223	A	11.435 D	Ho-162m				
< 10.	--	u Th-234	B-	24.10 D					
< 10.	--	u Pa-234m	IT	1.17 M					
10.25	0.76	a Th-231	B-	25.52 H	Y - 86m	Np-235			
10.26	--	x Tl La			Tm-157				
10.52	--	x Hf Lg							
10.54	--	x Pb La			Po-205	Ce-137	Sr-100		
10.83	--	x Bi La			Sb-124m1				
10.9	--	a Pa-231	A	3.276E+4 Y					
11.12	--	x Po La			Rn-209	Ho-160m2	Cs-134m		
11.41	--	x At La							
11.71	--	x Rn La			Pt-184				
11.85	--	x Hg Lb			Sm-153m				
12.02	--	x Fr La			Au-191m	At-204			
12.23	--	x Tl Lb							
12.33	--	x Ra La			Ba-133m	La-133			
12.4	--	a Pa-231	A	3.276E+4 Y	Sc- 45m	Ca- 45			
12.61	--	x Pb Lb			Eu-152m2				
12.64	--	x Ac La			Pt-193m				
12.7	--	a Ac-227	A	21.773 Y					
12.75	0.304	t Ra-228	B-	5.75 Y					
12.95	--	x Th La			Pu-239				
13.01	--	x Bi Lb			Tl-193m	Ge- 73m			
13.27	--	c Ge- 73m	IT	0.499 S	As- 73				
13.27	--	x Pa La							
13.41	--	x Po Lb							
13.52	1.6	t Ra-228	B-	5.75 Y	Gd-155m				
13.6	--	x U La			Au-191m				
13.83	--	x Hg Lg			Ba-140	Ir-179			
13.83	--	x At Lb							
14.1	--	a Pa-231	A	3.276E+4 Y	Gd-153	Hf-177m1			
14.25	--	x Rn Lb			Dy-157m				
14.29	--	x Tl Lg			Hf-166				
14.4	0.016	a Ra-223	A	11.435 D					
14.41	--	c Fe- 57	NN		Mn- 57	Co- 57			
14.68	--	x Fr Lb							
14.77	--	x Pb Lg							
15.	--	a Fr-223	B-	21.8 M	Cs-130m				
15.12	--	x Ra Lb							
15.15	3.	t Ra-228	B-	5.75 Y					
15.2	--	a Ac-227	B-	21.773 Y					
15.25	--	x Bi Lg							
15.5	0.16	t Ra-228	B-	5.75 Y	Yb-161				
15.5	--	a Pa-231	A	3.276E+4 Y					

Energy 15.5 ～ 31.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
15.57	--	x Ac Lb							
15.74	--	x Po Lg							
16.04	--	x Th Lb			Re-188m	Nd-152			
16.2	0.72	t Ra-228	B-	5.75 Y	Hg-195m				
16.25	--	x At Lg			Pu-246	Ta-182m1	Ta-182m2	Pt-183m	
16.5	0.306	a Pa-231	A	3.276E+4 Y	Zn- 72				
16.51	--	x Pa Lb							
16.77	--	x Rn Lg							
16.98	--	x U Lb			Ti- 52				
17.2	0.227	a Th-231	B-	25.52 H	U -231	Np-235			
17.30	--	x Fr Lg			Nd-154				
17.85	--	x Ra Lg			Sn-126	Sb-126m1	Ag-113m		
18.07	< 0.33	a Th-231	B-	25.52 H	U -231	Np-235			
18.2	--	a Pa-231	A	3.276E+4 Y	Ho-161	Eu-152m2	La-136m		
18.4	0.014	t Ac-228	B-	6.15 H					
18.41	--	x Ac Lg			Pd-112				
18.98	--	x Th Lg			Eu-155				
19.	0.374	a Pa-231	A	3.276E+4 Y					
19.1	1.5E-03	a Fr-223	B-	21.8 M	U -231				
19.1	3.7	a Th-231	B-	25.52 H					
19.57	--	x Pa Lg			Lu-171	Au-187m			
19.59	61.	a U -235	A	703.8E+6 Y					
19.6	--	a Pa-231	A	3.276E+4 Y	Pt-195m				
20.02	9.9E-03	u Th-234	B-	24.10 D	Sb-128m				
20.17	--	x U Lg			Os-180	Ir-174m			
20.3	0.012	a Fr-223	B-	21.8 M	Zr-102				
20.3	0.182	a Th-227	A	18.72 D					
20.95	--	a Th-227	A	18.72 D	Xe-142	Gd-155m	Gd-151	Sm-151	Te-117m
					La-136m	Pb-203m2			
22.7	--	a Pa-231	A	3.276E+4 Y	I -132m	Kr- 75	La-136m	Pr-151	Eu-149
					Sm-156	Sn-126	Hf-166	Tb-151m	Dy-151
23.44	--	c Ge- 71m	IT	20.40 MS	Tl-198m1	Tl-198m2	Sn-126	Yb-157	Ge- 71m
23.6	4.8E-03	a Pa-231	A	3.276E+4 Y	W -185m	Pd-116			
24.14	4.1E-03	a Fr-223	B-	21.8 M	In-119	Sb-119	Sn-119m	Hf-172	Ru-103m
					Yb-169m				
24.5	--	a Ac-227	B-	21.773 Y	Pd-101	Fm-255	Co- 58m	La-127m	
24.5	=5.1E-03	a Pa-231	A	3.276E+4 Y					
25.51	0.117	a Pa-231	A	3.276E+4 Y	Xe-120	Pu-243	Sn-119m	Ag-105m	
25.64	14.5	a Th-231	B-	25.52 H	U -231	Np-235	Tb-161	Ho-161	Sm-155
					Sb-124m2	Cr- 56	Ac-231		
26.4	0.014	t Ra-228	B-	5.75 Y	Yb-157	Sb-122m	Hf-166	Hg-185m	Ce-131
					Ir-190m1	Tl-201	Pu-237	Am-241	U -237
26.55	0.54	a Th-231	B-	25.52 H	Eu-155	Pu-241			
27.	--	a Pa-231	A	3.276E+4 Y	Ag-119	Er-154	Au-194m1		
27.27	9.1E-04	a Fr-223	B-	21.8 M	Gd-145m				
27.36	10.29	a Pa-231	A	3.276E+4 Y	Ra-227	Eu-154m	Cd-103	Pu-246	Te-129m
					Ir-194m1	Mo-108	Tm-160m	Ir-195m	Pt-195m
29.3	0.035	a Th-231	B-	25.52 H	Xe-117	Nd-152	Ag-117m	Eu-154m	Ta-169
					Lu-169m	Zr- 86	Pa-229	Th-233	
29.49	1.6E-03	u Th-234	B-	24.10 D					
29.6	=3.3E-04	a Fr-223	B-	21.8 M	Lu-167	Cs-117			
29.6	=4.9E-03	a Th-227	A	18.72 D					
29.86	7.5E-04	a Fr-223	B-	21.8 M	Ir-194m1	Er-156	Cf-247		
29.86	0.093	a Th-227	A	18.72 D					
29.96	0.109	a Pa-231	A	3.276E+4 Y	Ba-140	Dy-165m			
30.6	--	t Ra-228	B-	5.75 Y	Ag-108m	Sm-155	Ba-123	Tl-201	Mg- 28
					W -179	Au-196m2	Zr- 93	Nb- 93m	Mo- 93
31.	0.01	a Pa-231	A	3.276E+4 Y	Yb-165	Os-189m	Es-253	Ir-195m	Ir-195
					Pt-195m	Am-243			
31.54	7.0E-03	a Pa-231	A	3.276E+4 Y	Ac-231	Hf-164	Ir-174	Cs-130m	Tm-155

Energy 31.5 ～ 45.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
31.58	--	a Fr-223	B-	21.8 M					
31.58	0.075	a Th-227	A	18.72 D					
31.6	0.016	a U -235	A	703.8E+6 Y	Hg-192	Fr-225	Fm-251		
31.82	--	x Ba Ka2			Eu-154m	Po-208	Rh-104m	Ce-134	
31.99	=9.6E-05	a Ra-223	A	11.435 D	Pt-199m				
32.19	--	x Ba Kal			Sn-128	Kr- 83m	Am-241	Tl-201	Au-193m
					Os-179				
32.73	0.073	a Th-231	B-	25.52 H	Cd-107	Rh-100m	Pd-100	Sm-153m	
33.32	0.03	a Th-231	B-	25.52 H	U -237	Pu-237	Am-241		
33.4	= 0.012	a Th-227	A	18.72 D					
33.6	0.101	a Ra-223	A	11.435 D	La-136m	Ce-144	W -176	Au-194m2	Cs-117
34.	--	a Pa-231	A	3.276E+4 Y	Lu-167	Pu-243	Es-251	Fm-255	
34.3	8.2E-03	u Pa-234	B-	6.70 H	Tc- 96m	Pu-235	Lu-166m1	Es-254	
34.7	= 0.037	a U -235	A	703.8E+6 Y	Es-254m	Rh-117	Pd-117m		
34.8	--	u Ra-226	A	1600 Y	Am-246m	Pa-229	Bk-246	Ir-194m1	
34.99	6.2E-05	a Fr-223	B-	21.8 M	Au-194m1	Er-156			
35.83	0.016	a Pa-231	A	3.276E+4 Y	W -174	Sb-125	I -125	Y - 83	Te-125m
					Es-254m	W -173	Eu-154m	Pm-153	
36.4	--	x Ba Kb			Ir-189	Mo-104	Sr- 98	Cd-124	Es-254m
36.8	--	u Bi-214	B-	19.9 M	Pt-178	Br- 80m	Hg-195m	W -168	Te-121m
					Sn-121m	Dy-157m	Ho-164m		
37.9	1.0E-04	a Fr-223	B-	21.8 M	Zr-104	Ta-173	Ir-185	Yb-164	Ho-155
38.19	0.16	a Pa-231	A	3.276E+4 Y	Sm-156	Ta-169	Au-193m	Ho-162m	Tm-159
38.9	0.11	a Th-231	B-	25.52 H	Te-112	Pu-239	Rh-105	Xe-142	Tc- 95m
					Os-190m	Ir-190m2	Gd-162	Ir-194m1	Lu-165
39.73	2.4E-03	a Pa-231	A	3.276E+4 Y	Ho-155	Sr- 79	Ho-159m	Hg-193m	I -129
					Cs-129	Pd-103	Eu-152m2	Ru-103	Rh-103m
39.86	1.06	t Bi-212	A	60.55 M					
39.97	0.013	a Pa-231	A	3.276E+4 Y	I -130m				
40.2	0.024	a Th-227	A	18.72 D	Pa-229	V - 45	Fr-212	Rn-208	Nd-136
					Cu- 58	Au-181	Mo- 99	Fm-255	Eu-155
41.4	0.03	a U -235	A	703.8E+6 Y	Sb-118m	Zn- 62	Yb-164	Nb- 94m	Ce-144
					Ca- 47	Zr- 84	Ag-115m	Hf-184	
41.55	0.016	a Th-231	B-	25.52 H	Nd-135	Bk-248m	Fm-252	Tb-153	
41.82	0.012	u Pa-234m	B-	1.17 M	Es-253	Pu-243	Os-191	Ir-191m1	Lu-172m
41.82	2.5E-04	u Pa-234	B-	6.70 H					
41.96	0.06	a U -235	A	703.8E+6 Y	Zn- 72	Ac-231	Cm-245	Pt-188	Np-241
					Cf-246	Cf-247	Tm-160m	Yb-160	
42.11	--	t Pb-212	B-	10.64 H	Rh-100m	Pd-100	Am-242		
42.16	0.039	a Th-227	A	18.72 D					
42.22	0.052	a Th-231	B-	25.52 H	Pu-243	Sr- 83			
42.46	9.0E-03	t Ac-228	B-	6.15 H	Yb-178	Pa-229			
42.48	6.0E-03	a Pa-231	A	3.276E+4 Y	Hg-181	Es-254	Sn-126		
42.86	0.058	a Th-231	B-	25.52 H	Mo- 90	Pu-237	Am-241	Bk-250	Fm-254
					Cm-244	Mo-102	Cf-250	Am-245	Am-240
43.05	7.0E-03	a Pa-231	A	3.276E+4 Y	Am-244m	Am-244	Es-253	Ac-224	Fm-253
					Am-243	Ir-194m1			
43.5	1.3E-03	u Pa-234m	B-	1.17 M	Bk-248m	Cf-252	Pu-237	Am-241	Pu-238
43.5	2.0E-04	u Pa-234	B-	6.70 H	U -239	Am-243	La-125		
43.8	0.264	a Th-227	A	18.72 D	Pt-200	Cm-249	Sm-139m	Dy-168	Ho-161
					Pu-246	Ge- 66	Hf-184		
44.08	7.0E-04	a Th-231	B-	25.52 H	Fr-225	Fm-251	Yb-157	Cm-242	
44.1	7.3E-03	a Th-227	A	18.72 D	U -240				
44.15	0.065	a Pa-231	A	3.276E+4 Y	Pu-241				
44.4	1.6E-02	a Th-227	A	18.72 D	I -134m	Nd-152	Tm-177	Lu-170m	Am-242
					Np-236m	Yb-162	Cm-243	Lu-174m	
45.34	0.034	a Th-231	B-	25.52 H	Zr- 84	Pu-242	Es-254m	Ba-125	Fr-220
					Tb-143	Ir-179	Np-236	Pu-240	Np-236m
					Tb-155	Au-194m1	Ho-155	Hf-163	
45.45	4.3E-05	u Pa-234	B-	6.70 H	Br- 76m	Kr- 76	Er-158	Tm-161	Sn-128

Energy 46.3 ～ 59.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
					Pd-118	Lu-181	W -166	Cs-122m1	
46.35	0.223	a Pa-231	A	3.276E+4 Y	Br- 82m	Nd-154	Se- 72	Mo-104	Te-114
					Cd-101	Sm-153m	Cs-147	Hf-164	Pu-239
46.45	--	a Th-227	A	18.72 D	Ta-183	W -183m	Re-183		
46.54	4.25	u Pb-210	B-	22.3 Y	Zn- 72	Os-191	Ir-191m1	Rb- 78m	Tm-165
47.91	--	t Pb-212	B-	10.64 H	Ho-155	Ru- 92	Pu-236	Hf-170	Hf-184
					Es-256m				
48.3	9.3E-03	a Th-227	A	18.72 D	La-145	Se- 86			
48.5	0.047	a Th-227	A	18.72 D	Lu-170m				
48.56	--	t Pb-212	B-	10.64 H	Cs-141	Am-242m1	Br- 71	Am-239	Br- 80m
49.55	0.064	u U -238	A	4.468E+9 Y	Zn- 74	U -240	Pu-235	U -236	Am-242m1
					Cm-243	Tb-151m	Dy-151	Se- 68	Se- 70
					Ta-171	Ir-173	Ir-173m	Tb-156m1	
49.89	0.038	a Fr-223	B-	21.8 M	Te-132	Pd-118	Au-199	W -174	Pr-147
49.89	0.558	a Th-227	A	18.72 D	Mo-104	Re-186m	Au-181	Fm-253	
50.13	0.497	a Fr-223	B-	21.8 M	Es-254m	Rn-208	Tb-165		
50.13	7.88	a Th-227	A	18.72 D					
50.84	--	a Th-227	A	18.72 D	Au-198m	Ac-231	W -176	Eu-159	Hf-182m
50.9	1.5E-03	a Pa-231	A	3.276E+4 Y	Eu-159	U -237			
51.22	0.02	a U -235	A	703.8E+6 Y	Ho-160m2	Cs-130m	Au-187	W -172	Fm-251
					Dy-157m	Pu-239	Pa-230	Es-253	
52.73	0.085	a Pa-231	A	3.276E+4 Y	Rh- 96m	W -171	Zn- 74	I -117	Er-156
					Sr- 98	Sn-106	Ta-183	W -183m	Re-183
					Sn-134	La-132m			
52.91	--	t Pb-212	B-	10.64 H	Lu-181	Er-157			
53.2	0.123	u U -234	A	2.455E+5 Y	Pm-155	Pt-197m	Ba-133	Th-225	
53.23	1.2	u Pb-214	B-	26.8 M	Ru-103	Pd-103	Hg-195m		
53.44	--	c Ge- 73m	IT	0.499 S	Ce-144	W -171	As- 73	Xe-118	Ge- 73m
					Cm-245				
54.1	<2.0E-03	a U -235	A	703.8E+6 Y	Ba-148	Cs-124m	Ga- 65	Mo-106	Ru-110
					Bi-204m2				
54.2	--	a Th-227	A	18.72 D	Gd-153	La-148			
54.25	< 0.03	a U -235	A	703.8E+6 Y	Dy-166	Tm-165			
54.6	0.077	a Pa-231	A	3.276E+4 Y	Tb-157	Eu-157	Na- 29	Pd- 94	Te-114
54.61	--	x Hf Ka2							
54.96	<1.5E-05	u Pa-234	B-	6.70 H	Cf-249	Pt-188	Xe-125		
55.03	=9.7E-04	a Ac-227	A	21.773 Y	Mo-104	Ba-125	Pt-178	Fm-251	Es-253
55.45	4.3E-05	u Pa-234	B-	6.70 H	Re-184m	Sm-135	Am-243	Os-182	Zr- 83
					Am-241	U -242			
55.79	--	x Hf Ka1			Zr- 99	Pd-100			
56.	9.3E-03	a Th-227	A	18.72 D	Sm-153	Ba-148	Ba-127m	La-127m	Ra-221
56.55	9.9E-05	a Fr-223	B-	21.8 M	Gd-161	Pu-241	Ru- 92	In-121	Ga- 74m
56.55	0.097	a Th-227	A	18.72 D	Pa-236	Zn- 74	La-136m	Ho-159	
56.72	--	t Pb-212	B-	10.64 H	Ho-164m	Ir-192m1			
56.76	6.1E-03	a Pa-231	A	3.276E+4 Y	Pu-241				
56.84	--	u Pb-214	B-	26.8 M	Au-195m	Cm-245	Pu-239		
56.96	0.019	t Ac-228	B-	6.15 H					
57.19	0.030	a Pa-231	A	3.276E+4 Y	Tm-167	Th-223	Br- 76m	Tb-161	Am-239
					Ce-143				
57.75	6.6E-03	u Th-234	B-	24.10 D	Hf-180m	Pr-151	Xe-127	Te-127	Te-127m
					Er-151m				
57.77	0.47	t Ac-228	B-	6.15 H	U -232	Dy-165m	Ho-162m	Am-241	Fm-255
58.2	1.4E-05	u Pa-234	B-	6.70 H	Sm-153m	Gd-159	Dy-159	Lu-163	Cs-124m
					Ba-123				
58.57	0.48	a Th-231	B-	25.52 H	Ce-133	Mo-108	Ce-127	Fm-255	Np-235
					Fe- 60	Co- 60m	Xe-117		
59.19	5.1E-05	u Pa-234	B-	6.70 H	Tb-152m	Re-186m	Ho-168m	Ce-144	Pr-144m
					Lu-174m	Hf-182m	Tm-159	Bi-196m2	Ho-161
					Rn-227				
59.6	8.7E-05	a Fr-223	B-	21.8 M	Pb-190	Pa-227	Tm-161	U -237	Pu-237

Energy 59.6 ～ 71.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
59.6	9.7E-03	a Th-227	A	18.72 D	Am-241	Er-172	Ga- 74m	Ag-111m	Nd-156
					Pd-111	Rn-208	Ho-160m1	Er-160	Xe-118
					Pt-200	Am-245	Es-255	Fm-255	Md-255
60.5	6.5E-03	a Pa-231	A	3.276E+4 Y	Au-200m	In-121m	Sn-130m	In-121	Ir-195m
60.5	--	a U -235	A	703.8E+6 Y	Hg-183	Cd- 98	Hf-172		
61.	--	u Bi-214	B-	19.9 M	Dy-157	Dy-157m	Fr-220	Zr-104	Ho-157
61.44	--	a Fr-223	B-	21.8 M	Sm-145	W -176	Pm-148m	Ar- 45	Zn- 60
61.44	0.084	a Th-227	A	18.72 D	Sb-122m	Au-195m	Hg-195	Np-239	Ba-148
					Sm-155	Fm-257	Xe-122	Cs-123m	Nd-133m
					Ir-177				
62.	--	a Th-227	A	18.72 D	W -174	Ge- 75m	Ge- 65	Rn-206	Hf-163
62.45	2.5E-04	a Fr-223	B-	21.8 M	Cr- 49	Pd-103			
62.45	0.188	a Th-227	A	18.72 D					
62.5	--	u Bi-214	A	19.9 M	Ce-145				
62.7	--	u Pb-214	B-	26.8 M	Tm-173				
62.7	2.5E-03	u Pa-234	B-	6.70 H					
62.7	1.2E-03	u Pa-234m	B-	1.17 M					
62.86	0.021	u Th-234	B-	24.10 D	Ir-194m1	Cd-124	Kr- 74	Yb-167	Cd-126
					Kr- 73	Os-172	Pt-186	Ra-230	Es-254
					Yb-169				
63.2	0.055	a Ra-223	A	11.435 D	I -119	Sn-130m	Ba-125	Yb-169	Po-204
63.29	4.84	u Th-234	B-	24.10 D	Co- 65				
63.65	0.05	a Pa-231	A	3.276E+4 Y	Tm-155m	Po-208	Rn-224	W -188	Re-188m
63.81	0.263	t Th-232	A	14.05E+9 Y					
63.86	0.023	a Th-231	B-	25.52 H	Ba-123	Eu-157	Ag-105	Cs-123m	Bi-208m
64.31	0.036	a Th-227	A	18.72 D	Mo-105	Fr-227	Sn-126		
64.37	≈ 0.04	a U -235	A	703.8E+6 Y	Es-252	Zr-102	Pm-154m	Ho-169	Ir-187
64.94	--	x Hf Kb2			Pa-229	Pr-131m	U -237	Cs-124m	Br- 73
					Tb-152m	Re-181			
65.12	5.4E-04	a Fr-223	B-	21.8 M	Ge- 66				
65.42	0.077	a Pb-211	B-	36.1 M	Ir-181	Au-187	Hg-185m	Ir-187	Os-179
					Dy-155	Te-121	Sn-119m	Mo-107	Mo-108
66.2	6.1E-03	a Th-227	A	18.72 D	W -185m	Ba-145	Cf-249	Ge- 75	Se- 75
					U -229	Ba-127	Ho-145		
66.4	7.3E-03	a Th-227	A	18.72 D	Se- 69	U -240	Rb- 77	Cd-104	Pu-246
					Lu-171	Tm-171			
67.25	5.8E-05	u Pa-234	B-	6.70 H	Cs-136	Tm-162m	Am-242m1	Er-157	Pu-243
					Se- 73m	Se- 73	Pm-145	Ho-158m1	Os-183m
					Ag-119	Cu- 61	Co- 61	Nd-155	
67.67	0.377	u Th-230	A	7.538E+4 Y	La-125	Pt-184	Ac-226	Pa-227	U -242
					La-129m				
67.81	--	u Th-230	A	7.538E+4 Y	Ta-182	Re-182m	Mo-108	Eu-159	Pa-229
					Am-239	Re-182	Ti- 44	Sr-102	Dy-165m
					Nd-154	Hf-172	At-206	Ru-109	Ir-189m2
					Er-172				
68.5	5.7E-03	a Th-231	B-	25.52 H	Eu-154m	Th-223	Gd-153	Hf-169	Cs-121m
					Rn-211	Lu-183			
68.72	0.053	a Th-227	A	18.72 D	Ga- 73	Mo-104	Tc-109		
68.89	--	x Hg Ka2			Yb-165	Ba-144	Au-194m2		
69.16	--	x Hf Kb1			Xe-141	Tc-109			
69.21	6.5E-03	a Ac-227	A	21.773 Y	Tm-163				
69.46	2.8E-05	u Pa-234	B-	6.70 H	Yb-157	Re-189	Ir-189		
69.8	9.7E-03	a Th-227	A	18.72 D	Sm-153	Gd-153	Mo-104	Ta-173	Ta-185
					Es-254	Sn-129m	Pd-119	Hf-172	Sn-130
70.5	7.0E-03	a Pa-231	A	3.276E+4 Y	Es-254	Pd-111	Pd-111m	W -177	Es-252
70.82	--	x Hg Ka1			Pt-184	Pr-154			
70.83	--	x Tl Ka2							
71.1	--	u Bi-214	B-	19.9 M	Hf-163	Lu-171m	Es-254m	Os-185	Hg-183
71.9	1.9E-03	a Pa-231	A	3.276E+4 Y	Pd-117m	Ca- 50	O - 22	Pu-241	Lu-177
					Mo-107	Er-174	Fr-212	La-136m	Er-158

Energy 72.7 ～ 83.7 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
					Po-199m	Ra-230	Ba-148	U -230	Ac-226
72.7	= 0.11	a U -235	A	703.8E+6 Y	Nd-154	Lu-171	Pm-145	Xe-122	Pr-145
					Se- 68	Xe-120	Pr-152	Au-181	Rn-210
72.72	3.7E-03	a Pa-231	A	3.276E+4 Y					
72.75	0.251	a Th-231	B-	25.52 H					
72.81	--	x Pb Ka2			Ba-127	Pr-131			
72.87	--	x Tl Ka1			Xe-142				
72.9	0.027	a Th-227	A	18.72 D	Hf-169	I -133m	Cf-251	Os-193	Hf-183
73.62	0.019	a Th-227	A	18.72 D	Am-242m1	Tb-164	Ho-164	Ru-108	
73.72	= 0.01	a U -235	A	703.8E+6 Y					
73.92	0.017	u Th-234	B-	24.10 D	Mg- 22				
73.92	0.013	u Pa-234m	IT	1.17 M					
74.15	0.024	a Pa-231	A	3.276E+4 Y	Yb-158				
74.4	4.0E-04	t Th-228	A	1.9116 Y	Ba-147	Ir-187	Os-191m	Ac-224	Tb-161
					Ho-161				
74.82	--	x Bi Ka2			U -239	Am-243	Pd-100	In-109	
74.97	--	x Pb Ka1			Rh-100m	Pa-227			
75.	5.9E-05	u Pa-234	B-	6.70 H	Tb-149m	Fm-257			
75.02	0.06	a U -235	A	703.8E+6 Y	Ir-187				
75.15	0.022	a Th-227	A	18.72 D	Sn-128	Eu-160	Fr-225	Pa-229	Th-223
					Ir-177	Sm-153	Gd-153	Sm-159	Ru- 94
					Pu-246	Cs-147	Pm-148m	W -172	Hg-186
					Pm-156	Lu-171	Zn- 76		
76.86	--	x Po Ka2			Sb-122m	Pm-147	Eu-147	Re-177	Pt-200
					Tm-174	Lu-174	Lu-174m	Mo-105	Sm-143m2
					Pd-117	Sm-157	Ce-133m		
77.11	--	x Bi Ka1			Nb- 88	Sn-113m	Ho-172	Pt-197m	Pu-241
					Sm-135	Pt-199			
77.34	0.026	t Ac-228	B-	6.15 H	Eu-152m2	Sn-129m	Pt-197	Au-197m	Hg-197
77.34	0.073	a Pa-231	A	3.276E+4 Y	Hg-197m	Gd-161	Tb-161	Ho-161	Fr-225
77.8	0.13	a Th-231	B-	25.52 H	Ba-142	Ba-125	Yb-159	Au-185	Hg-186
					Hg-189gm	Yb-161	Ti- 44		
78.95	--	x At Ka2			Ru-111	Eu-159	Pb-190	Lu-173	Sm-155
					Ho-170m	Tm-170	Lu-172	Tm-172	Hf-166
					Ho-171				
79.29	--	x Po Ka1			Ag-108m	Y - 81	Cm-245	Ho-167	Nd-154
					Dy-159	Au-181	Te-134	Eu-158	
79.72	0.126	a Fr-223	B-	21.8 M	Gd-159	Tb-158	Ba-133	Xe-133	Re-177
79.72	1.87	a Th-227	A	18.72 D					
79.84	9.9E-05	u Pa-234	B-	6.70 H	Mo- 88	Tm-168	Ho-168	Cs-138m	
80.11	--	x Hg Kb1			Pa-227	Xe-121	Xe-140	Yb-165	Ce-144
					Fm-257	Ir-193m	Ag-101	Ba-130m	Cs-130m
81.	0.045	a Pb-211	B-	36.1 M	Ho-166	Tm-166	Ho-166m	Tb-162	Ho-162m
					Dy-153	Es-254	Fm-255	Mo-101	Xe-133
					Ac-226	U -230			
81.07	--	x Rn Ka2			Rh-113	Te-131m			
81.23	0.89	a Th-231	B-	25.52 H	Cs-122m1	Np-235			
81.52	--	x At Ka1			Fm-255	Ta-173	Ta-175	Os-176	Ag-119
= 82.	=1.2E-03	a Ac-227	A	21.773 Y	Te-121m	Zr- 99	Xe-141	Ba-144	Ag-116m
					Pm-154m	Pm-154			
82.09	0.4	a Th-231	B-	25.52 H	Zn- 76	Yb-176m	Lu-176m	U -231	Tm-176
82.42	--	x Tl Kb1			Es-250	Sn-131gm	Yb-166	Ru-112	Os-194
					Ce-135m	Pt-191	Os-191	Ir-191m1	
82.47	--	x Hg Kb2			Dy-166	Tc-105	U -240	Pr-135	Hg-188
83.	4.2E-04	u Tl-210	B-	1.30 M	Tb-153	Cs-130m	Cr- 56	Tc- 94	Nd-153
					Ac-224	Dy-157	Pt-187		
83.23	--	x Fr Ka2							
83.3	0.079	u Th-234	B-	24.10 D	Re-184m	Cs-123	Pr-151	Pm-153	Sm-153
					Cr- 57	Mo-103	Er-157	Cd-104	Ho-167
83.79	--	x Rn Ka1			Ac-223	Nd-154			

Energy 83.8 ～ 94.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
83.8	0.058	a Pb-211	B-	36.1 M	Te-114	Se- 73m	Pd-100	Pu-243	Bk-247
84.21	6.6	a Th-231	B-	25.52 H	In-109	Fr-212	W -176	U -231	Np-235
					Lu-170				
84.37	1.22	t Th-228	A	1.9116 Y	Ir-194m1	Re-177	Fr-224	Tm-161	Ac-224
					Ir-189m2				
84.77	--	x Pb Kb1			Cu- 68m	Nd-156	Pt-178	Au-183	Au-196m1
					Re-182m	Re-182	Sn-130m	Re-183	Os-177
84.87	--	x Tl Kb2			Tm-159	Rh-113	Pb-197m	Bi-197	Tc- 92
85.43	--	x Ra Ka2			Cs-147	Gd-141m	Tb-141	Nb-105	W -188
					Ru-110	Ba-125	Pt-177	Sn-132	
85.8	5.8E-03	a Th-231	B-	25.52 H	Ge- 64	Cs-121			
86.11	--	x Fr Ka1			Eu-155	Rb- 81m	Ir-179	Cs-136	Mo-108
					Ba-148	Th-233	Eu-155	Gd-155m	Tb-155
87.02	0.019	u Th-234	B-	24.10 D	Pr-147	Am-242m1	Am-243	As- 69	Tb-160
					Sn-126	Mo-104	Pm-137	Dy-157m	
87.17	--	x Bi Kb1			Co- 63	Nd-155	Ce-137m		
87.3	--	x Pb Kb2			Re-186m	Te-136	Xe-119	Au-181	Lu-169
					Hg-183				
87.68	--	x Ac Ka2			Cr- 47	Ir-183	Lu-165	Sn-126	Sm-156
					Ru-114	Dy-165m	Tm-168	Lu-168m	Pr-131m
					Ir-177				
88.2	0.017	a Pb-211	B-	36.1 M	Ce-133	Tb-161	Th-223	Th-233	Ag-109m
					Pd-109	Ru-113	Tm-155	Tm-155m	Ru-110
					Sb-113	Te-127m			
88.35	13.25	Lu-176	B-	3.78E10 Y	Ta-176	Lu-176m	Kr- 75	Tb-156m2	
88.47	--	x Ra Ka1			Au-189	U -229	Sr-100	Te-123m	Zn- 72
					Lu-178m	Hf-178m2	Hf-178m1	Ta-178m1	Eu-156
89.62	--	x Po Kb1			In-130	In-130m2	Pd-115m	Hf-175	Sm-153
					Tc- 99	Cs-124m	Ne- 25	Cm-245	Tc- 99m
89.78	--	x Bi Kb2			Kr- 74	Ir-172	Cd-117	Rh- 99	Sb-120m
					W -172	Eu-152m2			
89.95	0.94	a Th-231	B-	25.52 H	Ar- 32	In-120m2	Ce-147	Au-181	
89.96	--	x Th Ka2							
90.	--	a Th-227	A	18.72 D	Bi-198m1	Fr-227	Nd-134	Te-114	Ir-177
					Pt-178				
90.89	--	x Ac Ka1			Xe-122	Cr- 49	Lu-172	Ga- 79	Rb- 99
					Ce-148	Mo-104	Pd-116	Xe-119	Ta-174
					Sn-128m	Cu- 67	Ga- 67	Ru-108	Ho-164
					Tm-164				
92.	--	u Th-234	B-	24.10 D	Pm-153	Hg-184	Pt-178	Yb-153	Ir-173
					Pt-177	Co- 55	Ba-145		
92.11	--	x At Kb1			Ra-230				
92.28	--	x Pa Ka2			Rb-101	Ta-171	Np-235		
92.32	--	x Po Kb2							
92.38	2.81	u Th-234	B-	24.10 D	Re-188m	La-123	Rn-227	Cf-249	
92.8	2.77	u Th-234	B-	24.10 D	Ba-123	Pt-184	Ac-223	Rb-101	Ce-147
93.02	0.045	a Th-231	B-	25.52 H	Mo-103	Cs-147	W -172	Bi-204m2	U -228
					Ge- 81	Ge- 81m	Ra-221	Ag-107m	Cd-107
					Lu-178m	Lu-178			
93.35	--	x Th Ka1			Hf-178m1	Hf-178m2	Ta-178m1	Mo-102	Pt-179
					Ga- 67	Lu-180	Cs-129	Hf-180m	Ta-180
					Rb- 91				
93.93	5.4E-04	a Fr-223	B-	21.8 M	Te-116	Ir-181	Kr- 74	Cm-245	Sr-102
93.93	1.35	a Th-227	A	18.72 D					
94.	0.4	a U -235	A	703.8E+6 Y	Ho-164m	W -189	Au-181	Er-161	
94.3	0.012	a Pb-211	B-	36.1 M	Lu-163	Er-173	Ho-149m	Pt-189	
94.65	--	x Rn Kb1			Ba-123	W -185m	Cs-123m	Th-233	Dy-165
94.65	--	x U Ka2							
94.9	--	x At Kb2			Nb-105	W -176	Re-177		
94.9	0.011	a Th-227	A	18.72 D					

Energy 95. ～ 105.2 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
95.	0.018	a Pb-211	B-	36.1 M	Mo-103	Pa-228	Ha-258	Ir-189	Ta-172
95.7	0.37	a U -235	A	703.8E+6 Y	As- 79	Xe-121	La-136m	Eu-159	Se- 79m
95.86	--	x Pa Kal			Sr-100				
96.	--	a Pa-231	A	3.276E+4 Y	Dy-165m	N - 19	Pd-113	Xe-119	Yb-176m
					Cf-246	Fm-257			
96.09	0.086	a U -235	A	703.8E+6 Y					
96.1	0.066	a Th-227	A	18.72 D	Tc-109	Fm-252	Es-254m	Eu-141m	Gd-141m
96.84	0.095	a Pa-231	A	3.276E+4 Y	Tc- 97m	Pt-191	In-130m1	Cs-124m	Ba-145
					Se- 75	Ag-111	Tl-194m		
97.	8.3E-04	u Tl-210	B-	1.30 M					
97.17	3.8E-04	u Pa-234	B-	6.70 H	Zr- 83	Rh-117	Pd-117m	Th-223	Rh-104m
97.25	--	x Fr Kb1			Ce-133m				
97.3	0.012	a Pb-211	B-	36.1 M	Cs-123	Cd-102	Ir-185		
97.53	--	x Rn Kb2			Sm-153	Gd-153	Ir-179	Fr-212	
97.55	0.023	a Th-231	B-	25.52 H	W -166	Ra-232	Nb- 99	Nb- 99m	Ce-152
					Hf-182m	Hf-182m	Hf-182	Se- 69	
98.43	--	x U Kal			I -132m	Ho-161	Ag-101m	Cd-101	Pm-135m
					Ba-148	Am-243	Ce-146	Hf-170	Ac-223
					Pu-239	Ir-195	Ir-195m		
99.28	0.12	a Th-231	B-	25.52 H	Cm-244	Au-195	Ho-158gm	Lu-181	Pt-195m
					Am-240	Tb-158	Pu-237	Am-241	Ce-148
					Ta-183	W -183m	Re-183	Fm-254	Bk-250
					Am-246	Np-235	Re-186m	Am-244	
99.51	1.26	t Ac-228	B-	6.15 H					
99.6	--	a Th-227	A	18.72 D	Lu-183	Dy-153			
99.85	5.1E-03	u Pa-234	B-	6.70 H	Sb-116m	Pt-179	Pu-238		
99.85	5.0E-04	u Pa-234m	B-	1.17 M					
99.89	--	x Ra Kb1			Rn-221				
= 100.	=9.1E-03	a Ac-227	A	21.773 Y	Ce-144	Xe-119	Er-163	Ir-195m	Pm-151
					Re-182	Fr-227			
100.21	--	x Fr Kb2			Ta-182	Re-182m	Sm-158	W -176	Ir-179
100.27	0.075	a Th-227	A	18.72 D	Sb-111	Er-151			
100.41	0.093	t Ac-228	B-	6.15 H	Er-174	Ge- 79	Nd-136	Ho-159	
100.84	0.03	a Pa-231	A	3.276E+4 Y	Hf-180m	Xe-141	Lu-173	Cd-121m	Ir-185
					Dy-149	Ta-170			
100.89	2.0E-04	u Pa-234	B-	6.70 H	Ce-146	Eu-154m	Zr-104	Ra-230	Nd-154
					Y - 81	Rh-115	Dy-147m	Au-187m	Pd-116
					Hg-193m	Kr- 72	Pt-178	Sr- 76	Au-200m
102.27	0.41	a Th-231	B-	25.52 H	W -179m	Ba-128	Fr-227	Hg-192	Np-238
					Zr-102	Nb-105	Tm-162	Tm-162m	Re-171
					At-200m1	At-200m2	Te-131m	Ir-183	Np-235
					Gd-161	Es-252	Lu-166	Lu-166m2	Lu-166m1
102.5	--	a Th-227	A	18.72 D	W -183m	Ir-181			
102.59	--	x Ac Kb1			Nb-103				
102.6	< 0.014	a Pa-231	A	3.276E+4 Y	Br- 76m	Tc-107			
102.95	--	x Ra Kb2			Zn- 72	Cd-126	Np-236	In-124m	Pu-237
					Te-116	Ce-134	Sm-156	Se- 81m	Ho-161
					Xe-114	Bk-245			
103.35	4.2E-03	u Th-234	B-	24.10 D	Sm-153	Gd-153	Kr- 76	Rb- 78m	Ir-196m
					Sb-132	Hg-187gm	Pa-238	Th-225	Pu-242
103.71	--	u Th-234	B-	24.10 D	Re-180	Ho-170	Ta-180	Pt-200	Pu-241
					Ho-172	Lu-165			
103.77	3.8E-04	u Pa-234	B-	6.70 H	In-122m2	In-122m1	Te-121m	Ba-144	Ho-155
104.2	0.019	a Ra-223	A	11.435 D	Es-254m	Rn-227	At-209	Te-112	Np-236m
					Pu-240	Ta-175			
104.4	--	u Bi-214	B-	19.9 M	Sn-108	Sm-155	Tm-163	Es-254m	As- 67
					Xe-116	Tm-177	Yb-177m	Sm-135	Ra-213m
					Nb- 91m	Re-184m	La-129m		
105.2	--	a Th-227	A	18.72 D	Pm-151	Sr- 79	Zr- 83	Nd-133m	Nd-133
					Ba-147	Ce-148	Ra-232		

Energy 105.3 ～ 118.1 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
105.33	--	x Ac Kb2			Eu-155	Tb-155	Lu-177m	Hf-177m1	Nd-153
					Au-200m	Te-129m			
105.74	--	x Th Kb1			Cd-119m	Zn- 77	Yb-157	Lu-181	
105.81	7.1E-03	a Th-231	B-	25.52 H	Pr-151	W -188	Br- 77m	Kr- 77	Tm-161
106.	--	a Pa-231	A	3.276E+4 Y	Xe-141	Re-188m	At-210	Fr-220	Tb-161
					Cm-243	Yb-167	Mo-108	Dy-149	Pt-179
106.61	0.017	a Th-231	B-	25.52 H	Tc-107	Pt-187	Gd-151	Tb-152m	
106.68	5.8E-05	u Pa-234	B-	6.70 H					
106.78	0.023	a Ra-223	A	11.435 D	Pd- 98				
106.79	1.3E-03	a Ac-227	A	21.773 Y					
106.85	< 0.03	a Th-231	B-	25.52 H	Rb- 90m	Ir-182	Pa-227	Os-193	
107.22	0.015	u Pb-214	B-	26.8 M	Ag- 96	Fr-225	Cd- 98	Ho-160m2	Lu-184
107.75	8.4E-03	a Th-227	A	18.72 D	Cs-138m	Ir-181	Eu-143	Ta-185	W -185m
108.	0.011	u Th-234	B-	24.10 D	Pm-154m	Ta-183	W -183m	Re-183	Tc-105
108.14	--	x Th Kb2			La-131	Tb-151	Ac-224	Dy-165m	Pm-157
108.58	--	x Pa Kb1			Nd-137m	Rn-221	Rn-224	Ba-131m	Pr-149
					Yb-180	Ho-153	Kr- 91	Ru- 97	Ho-153m
109.16	1.54	a U -235	A	703.8E+6 Y	Nd-136	Re-176	Pu-236	Pu-243	Te-125m
109.6	=6.1E-03	a Th-227	A	18.72 D	Pb-200	Ge- 79	Ge- 79m	Am-242m1	Cs-147
109.9	--	c F - 19	NN		Tb-153	Er-169	Yb-169	La-123	Hg-186
					Ne- 19	Re-181			
110.	6.0E-05	u Th-230	A	7.538E+4 Y	Pt-187	Pa-227	Ir-192	Ra-213m	Ra-213
					Sm-134	Au-193	Tb-158m	Fr-225	
110.65	7.9E-05	a Fr-223	B-	21.8 M	Tm-157	Ge- 80	Pd-115	La-129	Dy-149m
110.65	--	a Th-227	A	18.72 D					
110.86	0.058	a Ra-223	A	11.435 D	Th-236				
111.00	--	x U Kb1			Eu-145	Tl-194m	Fr-222	Au-200m	Th-226
					Re-184	Re-184m			
111.49	--	x Pa Kb2			Cu- 68m	Xe-125m	Er-149m	Tm-149	Ba-144
					Lu-168	Es-256m	Rn-221	Rb-101	Sm-139m
					Ir-194m2	Te-132	Lu-174m	In-126m	Sm-139m
					Pd- 98	Cs-125	Pt-184m		
112.6	=8.5E-03	a Th-227	A	18.72 D	Cr- 59	Zn- 72	Br- 75	Hg-186	Ru-110
					Ir-194m1	Cr- 48	Lu-168	Re-174	Cs-145
					Cs-138m	Au-193	Tm-161	Xe-140	Nd-135
112.81	0.277	u Th-234	B-	24.10 D	U -236	Ta-177	Lu-177m	Lu-177	Hf-177m1
113.16	0.655	a Th-227	A	18.72 D	Tb-144m	Nd-155	Yb-159	Gd-141m	Tb-141
					Yb-167				
113.5	0.01	u U -238	A	4.468E+9 Y	Rh-109	Rn-224	Ag-115m	W -172	Ba-140
					Th-223	Re-182	Ir-189m2	Yb-175	Hf-175
					Pt-189	Nd-139m	Nd-139	Tm-159	
114.45	--	x U Kb2			Pu-241	Mo- 93m	U -229	Hf-172	Au-193
					Hf-182m	Nd-149	Hf-182	Y - 81	Os-183m
					Sm-159	Os-183			
114.5	9.0E-03	a Ra-223	A	11.435 D	Rh-101	Re-183m			
114.56	9.8E-03	t Ac-228	B-	6.15 H	Pd-116	Ir-177	Gd-146	Ba-127	Ce-152
115.18	0.592	t Pb-212	B-	10.64 H	C - 18	W -172	Ba-144	Ag-121	W -177
					Sb-134m	Yb-156	Yb-157	Au-183	Au-198m
115.45	0.07	a U -235	A	703.8E+6 Y	Y - 81	Gd-146			
115.63	1.0E-03	a Th-231	B-	25.52 H	Pa-229	Sb-115	W -177	Nd-134	Lu-177m
					Os-182	Cd-102	Eu-141m	Ru-110	Ba-123
116.82	0.021	a Th-231	B-	25.52 H	Pu-239	Te-132	Nd-138	Ru-109	Ag-123
					Yb-167	Er-171	Xe-117	Rh-113	Nd-151
117.2	0.167	a Th-227	A	18.72 D	Pa-229	Eu-152m1			
117.5	0.012	a Th-227	A	18.72 D	Ac-229	Pm-156	Nd-154	Gd-143m	Am-243
					La-147	Pa-230			
118.16	0.094	u Pb-214	B-	26.8 M	Os-174	Os-181	Yb-165	Os-181m	Er-169
					La-145	Pm-133	Xe-140	Mo-108	Ho-160m2
					Y -100	Er-173	Hg-199m	Xe-141	Yb-162
					Mo- 89m	Ba-140	Sm-134	Au-181	Pa-229

Energy 120.3 ～ 134.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
120.35	= 0.026	a U -235	A	703.8E+6 Y	Sr- 98	Zn- 78	Ac-223	Dy-165m	Kr- 75
					Tm-159	Tb-147	Y - 81	Pm-153	Ir-184
					Xe-118	Re-179	Zr-103	Ba-123	Fr-210
					Tl-196m	Hf-170	Au-200m	Fe- 61	In-124m
					C - 16	Nd-147	Hf-177m2	In-128m	Sr- 99
					Lu-165	Au-181			
120.9	0.034	u U -234	A	2.455E+5 Y	As- 67	Sm-140	Ir-189m2	Pa-229	La-123
					Ho-159	Se- 75	Ge- 75m	Sm-157	W -175
					Ba-146				
121.53	2.1E-03	a Ac-227	A	21.773 Y	Pm-147	Eu-147	Er-157	Zn- 71m	Zn- 71
					Lu-177m	Y - 99	Eu-152m1	Eu-152	
122.06	--	c Fe- 57	NN		Pm-152m1	Pm-152	Er-174	Am-242m1	Kr- 90
					Hf-171	W -185m	Mn- 57	Co- 57	Hf-164
122.32	1.19	a Ra-223	A	11.435 D	Sr- 96	Sn-106	Ta-186	Mo- 90	Er-173
					W -172	U -229	Re-186	As- 67	Yb-177
					Br- 71	Hg-195m	Lu-179		
123.5	--	t Pb-212	B-	10.64 H	Hf-172	Rh-111	Eu-154	Tb-154m2	Tb-154m1
					Ir-172	Yb-163	Lu-164	Re-172	Re-172m
					Lu-179	Sm-136	Ba-123	Ir-181	
123.52	9.7E-03	a Th-227	A	18.72 D	Hf-169	Ag-123	Hf-173	Cd-104	Er-155
124.1	--	t Bi-212	A	60.55 M	Ba-131	Ta-168	Er-171	Y - 81	Fr-212
124.58	4.8E-03	a Pa-231	A	3.276E+4 Y	Kr- 72	Am-239	Ti- 52	Fr-220	Xe-127m
124.8	=2.4E-03	a Th-227	A	18.72 D	Cs-127	Pb-202m			
124.8	2.8E-07	u Th-230	A	7.538E+4 Y					
124.91	0.056	a Th-231	B-	25.52 H	Pd- 96	Tm-162m	Os-175	Hg-180	Pa-227
					W -174				
125.46	1.3E-03	u Pa-234	B-	6.70 H	Rb- 99	Lu-181	Pu-237	W -185	Os-185
					Pd-118	Yb-155	Os-177	Yb-162	Br- 73
					Tm-160	Pa-229	In-123m	Tc- 95	Tm-160m
					Hf-172	As- 77	Ta-175	Cr- 55	Cr- 58
					Pd-100	Nd-138	Lu-174m	Os-196	Zr-103
					Hf-164	Rh- 94			
129.06	2.42	t Ac-228	B-	6.15 H	Ge- 64	Ru-114	U -240	Sr-101	Lu-177m
					Ac-224	Br- 83	Rb- 83	Au-194m2	Tc-109
					Pm-135m	Er-151m	Tm-161	Te-137	U -232
					Fr-230	Ba-129	Ba-129m	Pa-228	Ba-128
					Hg-182	Pu-239	Pm-153	Pt-191	Os-191
					Tb-148m	Pt-195m			
130.	--	t Bi-212	B-	60.55 M	Rh-105m	Hg-190	Kr- 77	Ir-195m	Ir-195
					Au-195	Ru-105	Pt-195m	Sr- 85	In-130
					Kr- 85	Sr- 85m	Pd-119	Bk-251	Nd-154
					Hf-164	W -189	Pt-197m	Pa-228	Kr- 79m
					W -173	Au-197m	Hg-197m	Pr-150	
130.59	0.119	a Rn-219	A	3.96 S	Nd-133	Er-174	Ce-134	Yb-169	Pa-227
					W -171	Re-182	Os-182	Yb-163	
131.2	5.5E-03	a Ra-223	A	11.435 D	Mo- 88	Fr-222	Th-226		
131.3	0.029	u Pa-234	B-	6.70 H	Pt-181	Ac-224	Re-171		
131.61	0.131	t Th-228	A	1.9116 Y	In-105	Ag-115m	Cs-130m	W -185m	Zr- 84
					Tb-141	Th-236	Fr-224	Rh-117	Pd-117m
					Ce-134	Ho-159	Yb-167	In-132	Eu-139
					Au-182	Yb-160			
132.9	--	u Th-234	B-	24.10 D	Cm-241	Lu-165	Kr- 75	Fr-220	U -229
					Ba-140	Sn-104	Nb- 90	Nd-138	Xe-121
					Rn-227	Te-112	Cm-245	Hf-181	Hf-163
					Np-241	Dy-167	Yb-154	Au-200m	Re-171
= 134.	--	a Ac-227	A	21.773 Y	Er-156	Ce-144	Ce-146	Ba-148	Ho-172
					W -179	Hg-197m	Tl-197	Cd-119	
134.03	0.024	a Th-231	B-	25.52 H	W -187				
134.48	6.9E-03	a Fr-223	B-	21.8 M	Pr-133	Bi-195gm	Ag-103m	Cd-103	
134.48	0.028	a Th-227	A	18.72 D					

Energy 134.6 ～ 147.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
134.61	1.8E-04	u Pa-234	B-	6.70	H	Tc- 90m	Ru- 92	Nb- 87m	Hg-188	Sr- 79
135.32	4.3E-06	u Pa-234m	B-	1.17	M	Hf-173	Zr- 87m	Ir-197gm	Am-242m1	Kr- 94
						Pt-185gm	Au-201	Ac-229	Tl-201	Te-136
						Ag-117	Hg-190			
135.54	0.018	t Ac-228	B-	6.15	H	Pt-193m	Sb-116m			
135.66	0.078	a Th-231	B-	25.52	H	Zr- 86	Ba-129	Se- 70	La-132m	Lu-161m
136.1	0.027	a Ra-223	A	11.435	D	Hg-192	Pt-200	Se- 75	Pd- 99	Pt-182
						Mo-102	Cm-245	Tc-103	Kr- 79	Zr-102
						Hf-181	W -181			
136.47	--	c Fe- 57	NN			Ho-155	Ir-172	Ir-192	Co- 57	Mn- 57
136.55	= 0.012	a U -235	A	703.8E+6	Y	W -174				
136.75	4.2E-03	a Th-231	B-	25.52	H	Ru-111	Pd-114	Tb-141	Fm-257	Lu-177
						Hf-181	Cm-249			
137.23	4.7E-05	u Pa-234m	B-	1.17	M	Ba-123	Hf-171	Po-204	Ir-186m	Re-186
137.23	4.3E-05	u Pa-234	B-	6.70	H	Ir-186	Au-194m2	Au-200m	Hg-190	
137.45	<6.0E-03	u Pb-214	B-	26.8	M	Rh-113	Dy-159	Rh-101	Yb-175	
137.91	0.024	t Ac-228	B-	6.15	H	Au-196m2	Nb- 99m	Nb- 99	Ho-156	Ho-172
						Tc-109	In-130	In-130m2	Os-174	Cs-138
						In-118m2	Sm-155	Fr-212	In-116m1	Bi-196m2
						Pr-149	Nb-103	Cs-134m		
139.68	--	c Ge- 75m	IT	47.7	S	Nd-151	Os-193	Hg-192	Es-252	Hf-184
						Yb-177	Ru-110	Tm-164m	Hf-173	Ge- 75m
						Pd-100	Cd-100	Tb-147	Bi-208m	Fr-225
140.15	1.3E-03	u Pa-234m	B-	1.17	M	Sm-140	At-210	Fr-220	Th-223	Ir-189m2
140.15	8.1E-04	u Pa-234	B-	6.70	H	Yb-161	Kr- 74			
140.54	7.1E-04	a Th-231	B-	25.52	H	Yb-160	Pt-188	Cs-147	Mo- 99	Tc- 99m
						Yb-179	Pt-195m	Pb-190		
140.76	0.22	a U -235	A	703.8E+6	Y	Es-250	Rh-102m	Ba-146	Ac-224	
140.88	0.021	t Th-232	A	14.05E+9	Y	Pa-229	Fr-228			
140.91	4.9E-04	u Pa-234	B-	6.70	H	Zr-104	Ba-125	Ta-175	Rn-223	Sr- 79
141.02	0.05	t Ac-228	B-	6.15	H	Rb- 97	Tl-201			
141.3	<4.0E-03	u Pb-214	B-	26.8	M	Nb- 90	Pt-189	Br- 75	Ce-146	Zn- 74
141.49	0.121	a Th-227	A	18.72	D	Xe-125m	Sm-155	Rn-227	Yb-152	Xe-119
						Er-148				
142.	1.3E-06	t Th-228	A	1.9116	Y	W -188	Am-243	Tc-107	Sr- 81	
142.4	=5.0E-03	a U -235	A	703.8E+6	Y	Ag-113m	Pb-190	Pb-200	Kr- 92	Ga- 79
						Sc- 46m	Zn- 71m	Hg-190	Tc- 99m	Fe- 59
143.1	--	a Ra-223	A	11.435	D	Re-186	Zn- 74	Rn-209	Se- 71	Hf-182m
						Cd-124	Rb- 79			
143.76	10.96	a U -235	A	703.8E+6	Y	Yb-167	Dy-168	W -174		
143.78	5.1E-04	u Pa-234	B-	6.70	H					
143.87	0.049	u Th-230	A	7.538E+4	Y	Dy-157	Tm-161			
144.1	2.3E-05	a Fr-223	B-	21.8	M	W -170	Ra-222	Tm-159		
144.23	3.22	a Ra-223	A	11.435	D	Rb- 98	Rb- 98m	Nd-136	Ac-224	
144.39	0.012	a Pa-231	A	3.276E+4	Y	Sr- 79	Yb-161	Bk-244	Au-200m	
144.94	--	t Bi-212	A	60.55	M	U -229	Zn- 72	Ba-146	Ce-149	Te-125m
						Sr- 77	Os-181m	Yb-175	Sn-130m	
145.06	5.8E-03	a Th-231	B-	25.52	H	Gd-141m	Tb-141	Sr- 76	Te-127	Xe-127
						Os-183	U -240	Ce-141	Nd-141	
145.85	0.158	t Ac-228	B-	6.15	H	W -168	Tc-107	Pd-118	Po-199m	
145.94	0.032	a Th-231	B-	25.52	H	As- 69	Pt-182	Hg-192	Cf-246	Eu-155
						Rh- 94m	Hf-179m2	Pm-146	Ti- 44	Re-186m
						Eu-159	Ac-229	Pa-229	Cm-239	Bk-243
147.	--	a U -235	A	703.8E+6	Y	Kr- 77	Y - 96	Y - 96m	Tm-161	Ta-182m2
						Th-225	Sr- 77	Kr- 72	Tc-111	Hf-171
						Re-189	Lu-177m			
147.48	3.1E-03	a Ac-227	A	21.773	Y	Yb-165	Pd-117	Ta-185	Te-114	Se- 71
						Po-200	Pb-200	Yb-158	Ir-173m	Ir-173
						Sr- 81	Mo-105	Ir-177	Hg-181	Au-196m2
						Dy-157m	Pt-177	Sn-104	Mo-102	Ag-103

Energy 149.8 ～ 166.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Cs-130m	Fr-225			
149.88	1.2E-04	u Pa-234	B-	6.70	H	Xe-123	Sm-158	Ra-221	Nd-136	W -175
						Ir-189m2	Sn-130	Te-131m	Te-131	Gd-149
						Rb- 77	Nb-105	Pa-228		
150.16	3.0E-05	a Fr-223	B-	21.8	M	Rn-221	Pa-232	Sr-102	Cd-104	Ce-135m
150.16	0.013	a Th-227	A	18.72	D	Tc-111	Nd-156	Er-157	Pu-233	Ru-108
						Lu-159				
150.93	0.076	a U -235	A	703.8E+6	Y	Dy-167	Zr-103	Sb-132m	Yb-177	Lu-163
						In-111	Cd-111m	Fm-254	Kr- 73	Kr- 85
						Kr- 85m	Sr- 85m	Pb-190	Th-225	Es-252
						Cu- 68m	Pd-100	Pd-118	Tm-155m	Nd-154
						Y -102m	Rh-113	Er-174		
152.71	9.6E-03	u Pa-234	B-	6.70	H	Th-223	Tm-155	U -228	Tl-197	Ir-177
						Zn- 77	Ta-182	Re-182	Re-182m	Y - 79
						Tc-112	Sn-128	Np-240	Es-251	Pu-238
						Cr- 49	Ga- 65	Ho-157	Ho-158m2	Kr- 75
						Lu-177m	Hf-177m1	Hf-164	Au-180	
153.98	0.722	t Ac-228	B-	6.15	H	Tm-161	Lu-181	Pb-203m2	Ta-169	Ir-185
						Sr- 81	Te-119m	La-123	Gd-151	Ho-172
						Hg-183	Xe-138	Am-244	Rn-221	Cs-121
154.21	5.62	a Ra-223	A	11.435	D	Rn-209	At-205	Ac-226	U -230	Sb-111
						Gd-146	Hg-190	Pt-184	Rb- 79	Au-182
						Ir-188	Ir-192m2	Y - 81		
158.56	--	c Sn-117	NN			W -190	Tc-105	Os-174	U -227	Cd-115m
						U -230	Xe-135	Ir-185	Hg-199m	Bi-196m2
						At-200m1	Np-236	Tl-199	Ni- 56	In-131m2
						La-148	Sn-117m	Sb-117		
158.63	0.685	a Ra-223	A	11.435	D	In-117	In-117m	Sr- 99	Ta-166	Ce-134
						Tm-149	Pu-242	Zr-103		
159.28	--	c Cu- 63	NG			I -123	Te-123m	Hg-184	Np-242	Se- 88
159.48	1.0E-03	u Pa-234	B-	6.70	H	Sc- 47	Au-181	Nb-100	Tc-105	
159.7	--	c Ge- 77m	IT	52.9	S	Tb-152m	Ge- 77m	Cs-121	Ba-128	V - 47
						Pm-140	Ir-174m	Rh-113	Cs-117	Os-172
						Pu-241				
160.26	5.8E-03	a Ac-227	A	21.773	Y	Cf-252	Sr- 77	Yb-158	Pu-240	Sn-123m
						Sn-123	Np-236	Ta-173	U -242	Mo-105
						W -183m	Xe-117	Xe-133	Ba-133	Pm-157
						Zr- 86	Hf-179m1	Ir-185	Rb- 79	Hf-183
						Ra-213m	Zn- 77	Tm-159	Mn- 50m	Cs-124m
						Ce-147				
162.1	=8.5E-03	a Th-227	A	18.72	D	Sm-134	Au-183	Re-184m	Tb-155	Hf-175
						Y - 97m1	Fr-206	Yb-163	Fr-220	Xe-114
						Os-170	Kr- 77	As- 77	Pr-131	Se- 77m
						W -190	Ir-172m	Sr- 77	Rn-227	Y - 97m2
						Hf-163	Ba-145	Pr-149	Ce-134	Ta-183
						In-116m2	Pr-154	Pt-184m	Ta-175	
163.1	0.155	a Th-231	B-	25.52	H	Kr- 72	Ho-158m2	Ba-140	Os-185	Tm-159
						Os-181m	Au-184	Lu-163	Nd-134	
163.33	5.08	a U -235	A	703.8E+6	Y	Am-242m1	Tb-155	Sr-101	Yb-162	In-122m2
						Ag- 99m	Cd- 99	Sm-137		
164.2	--	t Pb-212	B-	10.64	H	Bk-251	Zr-103	Cs-136	Ba-136m	Xe-131m
						Pm-157	Nd-131	I -118m	La-145	Pr-152
						W -185m	Yb-164	Yb-157	Rh-115	Xe-142
164.94	8.2E-05	u Pa-234	B-	6.70	H	Ac-229	U -237	Nd-135	Hf-170	Ac-224
165.	3.9E-03	a Th-231	B-	25.52	H	Hg-197m	Tb-149	Tb-149m	Pu-236	Cm-241
						Nd-154	Gd-161			
165.5	5.5E-03	a Ra-223	A	11.435	D	Ho-170	Hg-190	Bk-245		
165.61	1.2E-04	u Pa-234	B-	6.70	H	Zr-103	Po-202	Sm-156	Ce-139	Ba-139
						Er-159	Kr- 88	Ho-159m	Pt-200	
166.41	0.104	t Th-228	A	1.9116	Y	W -173	Ru-110	Ho-149m	Yb-159	Ta-171

Energy 166.5 ～ 182.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Ho-158m2	Au-189m	Ac-224		
166.5	2.4E-07	u Pa-234m	B-	1.17	M	Au-191	Hg-189gm	Pr-151	W -175	Lu-162
						At-210	Ge- 67	Rb- 97	Cu- 58	Os-181
						Kr- 94				
168.29	0.014	a Th-227	A	18.72	D	Ba-147	Tl-201	Au-201	Pb-192	Pm-151
						Rn-211	La-129	Lu-183	Bi-202	Sn-108
168.65	0.013	t Ac-228	B-	6.15	H	Sr- 93	Y - 93m	Pd-117m	Fe- 52	Rn-211
						Pd- 95m	Cd-127	La-123	Sm-137	Te-133m
169.66	1.2E-03	a Th-231	B-	25.52	H	Th-233	Tb-144m	U -240	Ce-137m	B - 13
						Ce-131	Cs-124m	Ba-124	Re-188m	Hf-179m2
170.	=3.6E-03	a Th-227	A	18.72	D	Fr-225	Pa-228			
170.07	0.032	u Pb-214	B-	26.8	M	Os-175				
170.85	8.1E-04	u Pa-234	B-	6.70	H	Mo- 88	Tb-153	Au-181	Mg- 27	Si- 27
						Os-183m	Nd-151	Au-194m2	Sn-123m	Tc- 93
						Ag-111m	In-111			
171.9	1.3E-03	a Ac-227	A	21.773	Y	Lu-173	Er-149m	Er-149	Tm-155m	Hf-182m
						Ta-182m2	Br- 71	Pm-154m	Pt-179	Bi-201
						Lu-177m	Tm-161	Te-127	Xe-127	Pd-111m
						Ta-173	Th-226	Zn- 76		
173.	< 0.04	a Th-231	B-	25.52	H	Xe-127m	Ce-149	W -166	Hf-182	Es-256m
						Ir-195m	Ba-144	Sm-153	Gd-153	Re-182
						Eu-160	Gd-141			
173.3	0.01	a U -235	A	703.8E+6	Y	In-131m2				
173.37	1.5E-03	a Fr-223	B-	21.8	M	Hf-182m	Pb-198	Rn-208	Au-193	
173.37	0.015	a Th-227	A	18.72	D					
173.96	0.035	t Ac-228	B-	6.15	H	W -185m	Zr- 86	Yb-160	Pm-156	Xe-132m
						Tb-141	Hf-162	W -168	Ta-185	Cr- 58
						Tl-192gm				
174.15	0.018	a Th-231	B-	25.52	H	Ra-221	Sm-141m	Zn- 75	Lu-165	K - 45
174.55	2.6E-04	u Pa-234	B-	6.70	H	Pd- 98	La-123	Yb-160	Lu-177m	Hf-177m1
						Gd-151				
174.95	--	c Ge- 70	NG			Eu-140m	Gd-140	W -173	Yb-155	Au-196m2
174.95	--	c Ge- 71m	IT	20.40	MS	Cm-245	Ge- 71m	As- 71	Xe-139	Si- 36
						Tc-111	I -132m	Nd-151	Np-241	Po-203
						Sc- 48	Cs-145	Pm-153		
175.8	0.019	a Ra-223	A	11.435	D	Hf-167	Re-183m	Np-240	Ho-161	Rh- 99
175.8	0.019	a Th-227	A	18.72	D	Ta-171	Xe-122	Xe-121	Mo-103	Xe-120
						Pm-133	Ga- 70	Ag-101m	Cd-101	Yb-167
176.68	0.052	t Pb-212	B-	10.64	H	Cs-119	Ac-223	Sb-125	Dy-151	Tm-174
						Cs-136	Cf-251	Lu-174m	Lu-174	Os-172
177.1	4.1E-03	a Ra-223	A	11.435	D	Tc-107	Os-173	Fr-220	Th-224	Cs-129
						Pm-151	Th-225	I -131	Yb-169	Yb-167
177.4	0.047	a Ra-223	A	11.435	D	Es-254m	Y - 79	Nd-137m	Pm-137	Ta-185
						Es-251	Fe- 61	Ho-159	Ir-187	Sm-158
						Nb- 97	Pd-116	Ho-172	W -189	Rh-109
						Xe-120	Xe-123	Pa-238	Se- 81	Dy-148
179.54	0.151	a Ra-223	A	11.435	D	Rb- 77	Lu-167	Rb- 75	Gd-142	Cd-100
						Sm-159	Ru-114	Lu-173	Cs-121m	Cs-121
						Re-182	Fm-257	Au-183	Lu-168	Rh-101m
179.8	7.1E-05	u Pa-234	B-	6.70	H	Er-157	Pd-100	Rh-115	Cd-124	Pu-246
180.2	3.2E-03	t Bi-212	B-	60.55	M	Hf-165	Tb-155	Hg-195	Tb-151	Cu- 76gm
						Au-198m	Sm-137	Cm-249	Nd-155	Pm-133
						Nd-154	Ba-127	Pu-233		
181.5	--	u Pb-214	B-	26.8	M	Te-134	Te-116	Hf-184	Os-175	Cs-146
						Mo- 99	Au-200m	Au-187	W -174	Re-173
						Lu-172	Ho-170	Zn- 78	Sm-135	Am-239
182.1	--	a U -235	A	703.8E+6	Y	W -168	Dy-142	Tb-158	Bi-204m2	U -242
						Ge- 66	Lu-167	Ce-132		
182.2	5.2E-06	t Th-228	A	1.9116	Y	Dy-157	Te-131m	Sb-130	Sb-130m	Fr-225
182.61	0.34	a U -235	A	703.8E+6	Y	Ar- 44	Rb- 79	Pm-153		

Energy 183.5 ～ 197.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
183.5	0.033	a Th-231	B-	25.52 H	Ni- 69	La-146m	Rb- 82m	Pt-177	Nd-139
					Hf-168	Bi-206			
184.54	0.07	t Ac-228	B-	6.15 H	Tb-165	Tc-101	Rh-101m	Rh-101	Ir-177
					W -171	Ho-168	Tm-168	Au-181	Ho-166
					Tm-166	Ag-117m	Re-175	Dy-155	Cu- 67
184.65	3.0E-03	a Fr-223	B-	21.8 M	Ir-181				
184.65	0.038	a Th-227	A	18.72 D					
184.7	1.7E-03	u Pa-234m	B-	1.17 M	Eu-154				
184.8	0.013	u Th-234	B-	24.10 D	Pm-154	Pm-154m	Ta-182m2	Tb-162	Pd- 95m
					Ho-162	Hf-182m	Hg-181	Pb-188	Er-155
					Ho-155				
185.72	57.2	a U -235	A	703.8E+6 Y	Tb-162	Eu-140m	Br- 91	Ac-226	Ru-113
					Ac-231	Cs-147	Sm-134	Pt-199	
186.01	--	c Cu- 65	NG		Re-189	Er-156	Pt-182	Au-187	Ge- 79m
186.05	8.8E-03	u Th-230	A	7.538E+4 Y	Fr-226				
186.15	2.8E-03	u Pa-234	B-	6.70 H	Au-193				
186.21	3.59	u Ra-226	A	1600 Y	W -177	Pt-187	Ho-159	Kr- 94	La-147
					Hg-192	W -177	Bi-203		
187.1	--	u Ra-226	A	1600 Y	Re-190	Re-190m	Ir-189m1	Ir-190	Os-190m
					Ir-190m2	Pt-189	Tc-109	Pt-187	Xe-122
					Ba-128	Ho-158m2	Os-173	U -228	Ce-134
					No-255	Tb-149	Ir-187	Lu-159	Pt-188
					In-125m	Xe-141	Au-193	W -185m	In-103
188.76	3.2E-03	a Th-231	B-	25.52 H	Sm-137	Cm-239	Re-184m	Pm-157	Ho-157
					Cs-117	Sr- 81	Au-196m2	Yb-161	Xe-125
					Re-189	Lu-167	Pm-139m	Sm-139m	Pd-109m
					Cs-124m	Fe- 59	Ba-124	Ru-111	Pr-151
					Re-179	Mo-106	Ra-230	Rh- 97m	Rh- 97
					Sm-158	Zn- 77	Ba-145	Bi-203m	Po-203
					Rh-113	Gd-141	U -240		
191.1	--	u Bi-214	A	19.9 M	Sm-139m	Eu-139	Yb-176m	Hg-185gm	Hg-188
					Ir-174m	Tm-161	Fr-222	In-114m1	Sm-157
					Th-226	Ba-141	In-114m2	Au-187	Kr- 81m
					Mo-108	Sm-158	Re-173	Ge- 65	Fr-225
					Pu-233	Xe-142	Bi-192gm	Rh-111	Gd-140
191.35	0.123	t Ac-228	B-	6.15 H	Ac-223	Hg-197	Eu-145	Re-182	Pt-197
					Au-186	Xe-116	Hg-186	Es-249	Pt-199
					Pb-196	Mo-101	Tb-151	Pt-184	Rn-227
					Pm-133	Tm-158			
193.	=9.6E-03	a Ra-223	A	11.435 D	Se- 68	Nb-104gm	Zn- 74	Fe- 59	Rn-208
					Nb-105	Sn-130	Dy-168	Fr-230	Hf-179m2
					La-124gm	Sm-137	Ho-151	Ga- 63	Hg-185gm
					W -174	Pt-179	Lu-170	Ce-134	
193.4	7.1E-04	u Pa-234m	B-	1.17 M	Np-240	Ho-157	Sb-128m	Ir-174	Fr-225
193.73	7.9E-04	u Pa-234	B-	6.70 H	Er-155	Pm-141	Hg-185gm	Yb-159	Ir-177
					Ru-107	Au-191	Nd-138		
194.94	0.63	a U -235	A	703.8E+6 Y	Tc-109	Ce-148	Ir-183	Ge- 77m	Rn-227
					Bk-245	Sr-100	Pt-188	Zn- 74	Rh-111
					Er-158	Rn-206	Cs-143	Lu-177m	
196.2	0.069	u Pb-214	B-	26.8 M	Os-177	Mo-101	Ce-148	Cs-121m	Cs-121
					Ba-147	S - 38	In-105	Kr- 88	Hg-191
					Hf-162	Sm-157			
196.8	1.2E-04	u Pa-234	B-	6.70 H	Dy-144	Tm-159	Xe-129m	Sm-141m	Nd-147
					Cs-127	Tl-190m	Re-177	W -173	
197.1	--	c F - 19	NN		Zr-100	Cs-119	Ba-146	Ho-160	Tb-160
					Ne- 19	Eu-139	Ge- 81m	Ge- 81	In-120m2
					Pm-147	Eu-147	I -136m	Ir-189	
197.61	0.013	a Th-227	A	18.72 D	Pt-185gm	Bi-198m1			
197.91	2.7E-05	u Pa-234m	B-	1.17 M	Rn-221	Fr-206	Sm-157	Mo-105	Ta-186
					Rh-101	Am-245	Bk-245	Ho-168	Tm-168

Energy 198.8 ～ 215.2 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
198.89	4.9E-03	a Pa-231	A	3.276E+4 Y	Gd-141m	Tb-141	Ce-147	Ge- 75	Ho-171
					Se- 75	Pu-237	Pm-135	Tl-198m2	Lu-168m
198.9	0.042	a U -235	A	703.8E+6 Y	Cs-147	Ho-153m	Tm-159	Cs-145	Ag-119
199.4	2.7E-03	a Ra-223	A	11.435 D	Tb-156	Cu- 73	Zn- 76	Er-173	Re-168
199.41	0.315	t Ac-228	B-	6.15 H	Au-195	Nd-138			
199.95	1.2E-04	u Pa-234	B-	6.70 H	Fr-225	Pt-200	Pa-228	Xe-135	
199.95	5.7E-04	u Pa-234m	B-	1.17 M					
200.5	7.5E-05	a Fr-223	B-	21.8 M	Au-195m	Hg-195m	As- 77	Pm-133	Tb-145
200.5	---	a Th-227	A	18.72 D	Te-131m	Pd-115			
200.97	1.4E-03	u Pa-234	B-	6.70 H	Os-196	Ho-155	Pu-238	Nb- 87	Nb- 87m
					Zr- 87m	Te-134			
201.6	0.03	a Th-227	A	18.72 D	Os-192m	Ir-192	Er-161	Pt-187	Ir-195m
201.82	85.54	Lu-176	B-	3.78E10 Y	In-103	Au-197m	Hg-197m	Ta-176	At-206
202.11	1.08	a U -235	A	703.8E+6 Y	Pt-197m	W -174	Lu-176m	Rn-224	
202.5	6.1E-03	a Th-227	A	18.72 D	Ba-129m	Zr-104	Ho-155	Y - 90m	Se- 68
					Se- 70	Ra-230			
203.12	1.0E-03	u Pa-234m	B-	1.17 M	Xe-127	Te-127	Kr- 74	Ag-120m	Mo- 90
203.12	2.0E-03	u Pa-234	B-	6.70 H	Pt-179	Fr-210	Hg-187gm	Lu-172	In-109
204.03	0.112	t Ac-228	B-	6.15 H	Lu-165	Zr-103	Hg-205	Xe-142	Lu-178
					Pb-194	Re-183m	Rb- 95	Ru- 91	Sm-156
					Nd-135	Au-198m	Lu-177m	Hf-177m1	Nb- 95
					Tc- 95m	Tc- 95			
204.27	0.194	a Th-227	A	18.72 D	Fr-227	Ho-158m2	Mo-103	Ag-117m	U -229
205.03	0.013	a Fr-223	B-	21.8 M	Bi-203m	Gd-143	Cs-117	In-107	Am-246
205.03	0.146	a Th-227	A	18.72 D					
205.1	5.2E-06	u Th-230	A	7.538E+4 Y	Yb-155	Tm-153			
205.31	5.01	a U -235	A	703.8E+6 Y	Ni- 69	Pt-186	At-208		
205.68	0.011	u Pb-214	B-	26.8 M	Hg-187gm	Am-244	Tc- 91m	Cs-117	Lu-183
					Os-192m	Ir-192			
205.93	0.02	t Th-228	A	1.9116 Y	Cm-241	Ho-159m	Lu-181	Er-159	Fr-224
206.11	0.206	a Th-227	A	18.72 D	Fr-222	Cs-130m	Th-226	Ru-109	Rn-223
					Ho-158m2	Ta-174	Po-199	Pr-131	Mn- 61
					Au-181	Au-185	Ac-223	Os-196	Hg-195m
209.25	3.89	t Ac-228	B-	6.15 H	Ir-189m2	Lu-177m	Lu-177	Hf-177m1	Ta-177
					Kr- 79	La-131	In-118m1	Re-183	Cu- 67
					Te-129	U -227	Pa-228	Er-161	Ho-151
209.9	1.3E-03	u Pa-234m	B-	1.17 M	Np-239	Cm-243	Rn-224	Re-177	Am-239
					Ta-163	Pt-182	Cm-242		
210.65	1.3E-04	a Fr-223	B-	21.8 M	Ir-174m	Pt-186	Tb-153	Tc-103	Hg-185gm
210.65	1.09	a Th-227	A	18.72 D	Ce-146	Te-134	Zr-104	Pb-190	Er-171
					Gd-159	Dy-159	Hg-181	Rn-202	
211.4	0.064	t Tl-208	B-	3.053 M	Ge- 77	Ta-164	Tb-164	U -229	Os-172
					Er-161	Hg-185gm	Ir-195m	Ir-195	Nd-149
					Au-195	Ba-143	S - 40	Ba-124	Cs-124m
					Ru-111	Ru-113	Es-254m	Xe-140	Pb-202m
					Tm-159	Po-205			
212.65	0.061	a Th-227	A	18.72 D	Tb-153	Te-121m	I -121	Pu-240	Hg-185gm
					Pr-131	Pt-185gm			
212.7	0.018	a Th-227	A	18.72 D	Ag-115	Tm-161	Ce-135m	Sr- 96	Zr-104
					Pm-132	Pb-192	Lu-167	Cd-102	Ta-178
					Ag-119	Rn-206	Lu-178m	Rb- 93	Hf-178m2
					Ta-178m1	Pr-135			
214.3	2.5E-05	a Fr-223	B-	21.8 M	Kr- 73	Dy-153	Ru- 92	W -179m	Y - 98
					Gd-163	Hf-177m2	Ta-172	Au-183	Ra-219
					Ba-129	Lu-179	Hf-179m1	Lu-177m	Hf-177m1
214.85	0.029	t Ac-228	B-	6.15 H	Ra-213m	Ra-213	Po-203	Au-198m	Zr- 86
					Ta-186	Pb-192	Ba-148	Lu-179	
215.28	0.027	a U -235	A	703.8E+6 Y	Tb-164	Te-127	Tm-166	Lu-180	Rh-109
					Bi-197m	Nd-138	Re-184m	Ta-184	La-147
					Hf-180m	Ba-128	Ge- 77m	Ge- 77	La-147

Energy 215.9 ～ 233.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
215.98	0.254	t Th-228	A	1.9116 Y	Tl-189m Tb-160 Y - 85 Pd-116	Rb- 84m Au-189 Tl-191m	Ru- 97 Fr-224	Ac-224 Rb- 99	Yb-160 Ac-223
216.47	0.022	u Pb-214	B-	26.8 M	Os-170	Ge- 79m	Tl-206m	Ga- 81	Re-184m
217.94	0.04	a Th-231	B-	25.52 H	Lu-178m Nd-134 Rh-113 W -172 Mo-103	Ta-178m1 Ce-132 Hf-179m2 Lu-165 Ba-126	Hf-178m2 Kr- 74 Kr- 79 Re-182 Pa-238	Re-189 U -229 Bk-244 U -231	Ir-189 Os-182 Ho-159 Sr-102
219.	1.3E-04	a Fr-223	B-	21.8 M	Zn- 73 Mo-105 Ir-181	Lu-177m Au-200m	Au-183 Xe-139	Ho-158gm Os-179	Tb-158 Dy-153
219.	0.014	a Ra-223	A	11.435 D	Tc- 95m	Ce-147	Tm-165	Br- 74	Sm-134
219.	0.102	a Th-227	A	18.72 D	Ho-155	Sr- 79	Br- 74m	Ra-221	Rb- 93
220.	2.3E-04	u Pa-234	B-	6.70 H	Re-189 Rh-113 Tm-159	Ir-189 Au-193m	Kr- 94 Hg-193m	Ag- 99	Ir-179
220.6	0.036	a Ra-223	A	11.435 D	K - 43	Ru-109	Nd-155		
221.	3.0E-03	u Bi-214	B-	19.9 M	Hg-187gm	Ba-129	Lu-163	La-135	Kr- 89
221.15	8.2E-05	u Pa-234	B-	6.70 H	Fr-211 Er-155	U -230 Ta-170	Ac-231		
221.38	0.12	a U -235	A	703.8E+6 Y	Xe-117	W -172	Fr-222		
221.5	0.03	a Rn-219	A	3.96 S	Br- 82	W -179m	Cs-117	Cs-147	Re-182
221.83	1.2E-04	u Pa-234	B-	6.70 H	Na- 31	Pu-233	Au-189	Pd-114	W -189
222.9	6.2E-05	a Fr-223	B-	21.8 M	Re-182 Tl-197m Pt-177 Pt-189	Ta-182 W -179m Hg-181	Ir-185 Pb-197m Xe-133	Gd-142 Ba-133	Hg-185gm Mo-108
223.85	0.054	t Ac-228	B-	6.15 H	Tc-112	Sm-139m	Eu-139	Lu-168	Np-232
224.1	8.9E-03	a Th-231	B-	25.52 H	Ir-185 Lu-182 W -166	Re-190 V - 55 Ir-174	Mo-102 Sn-106 Hg-191	Gd-141m Sm-158 Zn- 78	U -230 Pd-118
225.5	=3.6E-03	a Th-227	A	18.72 D	Pm-133 Xe-139	Tl-201m Sm-140	Pb-194 Tc-105	Cs-119 In-106	Fr-225 Au-189
226.5	6.8E-03	u Pa-234	B-	6.70 H	Tl-195 Dy-159 Re-182 Pr-152	Tb-154m2 Os-175 Tl-198m1 Re-184m	Ru-109 U -229 Np-239 Tm-155	Am-247 Am-239	Gd-159 Xe-116
227.25	9.2E-03	u Pa-234	B-	6.70 H	Dy-155	Yb-177m	Cf-251	W -188	Pt-200
228.5	1.8E-05	t Th-228	A	1.9116 Y	Tm-162m Ir-172m Tl-194m Np-239 Lu-177m	Tm-162 Np-239 Sm-139 Am-239 Hf-177m1	Ru-113 Lu-166 Cm-243 Pu-237	Hg-186 Lu-166m2 Ti- 53 Lu-168	Fr-212 Lu-166m1 Os-172 Ir-183
228.78	8.0E-03	a U -235	A	703.8E+6 Y	Zn- 75 Er-155	Cs-143 Rh- 95	Ag-115m Gd-147	Ag-115 Ta-182	Sm-134 Re-182
230.	<4.0E-03	u Bi-214	B-	19.9 M	Ho-172	Ba-128	Th-236	Hf-175	Pt-185gm
230.	1.7E-03	a Pa-231	A	3.276E+4 Y	La-124gm	Sm-158	Ta-169	Ac-226	W -179m
230.3	---	a Th-227	A	18.72 D	Rn-209	Sr- 76	Ho-153m	Pt-181	U -230
231.42	0.025	t Ac-228	B-	6.15 H	Ce-131m Fr-204m2 Re-183m Y - 85m	Ge- 79m I -121 Cd-115 Xe-119	Ge- 79 Rh-111 Ce-143	Pm-154m Yb-157 Ba-146	Cm-247 Ir-181
232.21	2.8E-04	u Pa-234	B-	6.70 H	Sr- 85m	Pd-114	Ce-145	Pm-154m	Cs-143
233.36	0.11	t Tl-208	B-	3.053 M	As- 69 Tc- 99m W -174	Pu-246 Nb-105 Hg-187gm	Xe-134m	Xe-133m	Rn-210
233.5	0.029	a U -235	A	703.8E+6 Y					
233.6	8.0E-04	u Pa-234m	B-	1.17 M	Ir-189	Ba-126	Pm-137	Lu-173	Cm-251

Energy 233.6 ～ 249.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
233.6	--	u Pa-234	B-	6.70 H	Br- 71	Nd-137m	Tc-101	Rh-101m	Kr- 74
					Er-155	Os-185			
234.81	0.041	a Fr-223	B-	21.8 M	I -134m	Np-233	Pb-197m	Bi-197	Kr- 90
234.81	0.4	a Th-227	A	18.72 D	Yb-163	Zr- 83	Cs-121m	Te-114	Er-155
235.	8.4E-06	u Th-230	A	7.538E+4 Y	Th-224				
235.11	1.8E-04	u Pa-234	B-	6.70 H	Ac-226	U -230	Tb-152m	Pu-233	
235.9	8.0E-05	u Pa-234m	B-	1.17 M	Pb-200	Zr- 95	Nb- 95m	Sr- 80	La-147
235.9	--	u Pa-234	B-	6.70 H					
235.97	12.13	a Th-227	A	18.72 D					
236.	=9.6E-03	a Ra-223	A	11.435 D	U -231				
236.	0.087	u Pa-234m	B-	1.17 M					
236.01	9.2E-03	a Th-231	B-	25.52 H	Sn-108	Yb-155	Hg-184	W -171	Ir-182
					Rn-211	Hf-179m2	Sm-135	Hg-189gm	Tc-112
237.8	< 0.09	a Th-231	B-	25.52 H	Fe- 51	Au-187	Er-171	Dy-146m	Ho-146
					Mn- 61	Ho-167	Os-181m	Po-199m	
238.4	< 0.015	u Pb-214	B-	26.8 M	Nd-137	Rh-101m	Tc-101	La-132m	Nb- 97
238.63	43.3	t Pb-212	B-	10.64 H	Hg-189gm	W -179m	Os-181	Y - 85	Sr- 85m
					Br- 77	As- 77	Yb-169	At-209	Tl-192gm
					Lu-167				
240.2	8.2E-05	u Pa-234	B-	6.70 H	Pt-195m	Tm-163	Cs-121	Cs-121m	Pb-203m2
					Lu-163	Tm-176	Os-172	Ir-183	Pb-196
					Pm-151	Po-201	Re-176	Bi-202	Ho-155
					Nd-149				
240.27	2.8E-04	a Th-231	B-	25.52 H	Hg-187gm	Pb-202m	Lu-181	Tm-164m	Mo-108
240.87	0.075	a U -235	A	703.8E+6 Y	Tc-110	Tl-196m	Hg-191	Am-245	Cf-249
240.99	4.1	t Ra-224	A	3.66 D	Te-131m	Cs-145	Ba-126	Au-191m	Fm-257
					Dy-146	Pb-202m	Si- 35	Kr- 73	Os-182
241.7	=1.6E-03	a Ac-227	A	21.773 Y	Tm-163	Nb- 96	Hg-191m	Cs-147	Er-155
					Sr- 92	Kr- 75	Y - 98m	Ac-223	Ba-146
242.	7.43	u Pb-214	B-	26.8 M	Ru-103	Pd-103	Zr-104	Pr-133	U -229
242.2	9.0E-03	a Pa-231	A	3.276E+4 Y	Fr-222	Th-226	Tl-195	Kr- 90	Tc-108
242.5	8.4E-04	a Th-231	B-	25.52 H	Lu-184	Se- 87	Np-233	Xe-138	In-108
					Cs-134	Os-181			
243.08	0.048	a Pa-231	A	3.276E+4 Y	Zr- 86	Tm-165	Cd-103	Tm-159	Au-185
					Pt-179	Pt-181	Gd-151		
243.5	5.0E-04	u Pa-234m	B-	1.17 M	Te-137	Zn- 62	Xe-125	Lu-160gm	Pt-189
					Tc- 92	Ta-185	Re-174	Pt-200	
244.	0.039	a Pb-211	B-	36.1 M	Sr-102	In-122m2	La-123	Ag-103	Sm-156
					Se- 70	Hg-185gm	Dy-153	Ta-183	Mg- 30
					V - 47	Te-114			
245.2	9.6E-03	a Ra-223	A	11.435 D	Pm-152	Pm-152m1	Eu-152	Ru-112	Ce-131
					Re-189	Ir-189	Ru-109	Bi-200	
245.37	1.2E-03	u Pa-234	B-	6.70 H	Bi-200m1	At-210			
245.4	--	c Cd-111	NN		Ag-111m	Ag-111	Cd-111m	In-111	Nd-135
245.6	7.8E-03	a Pa-231	A	3.276E+4 Y	Pm-133	Ge- 66	Sm-155	Sr- 79	Cs-147
246.04	0.011	a Pa-231	A	3.276E+4 Y	Cs-119m	Po-199	Th-225	U -228	Ta-183
246.19	2.9E-04	a Fr-223	B-	21.8 M	Pt-199				
246.19	9.7E-03	a Th-227	A	18.72 D					
246.84	0.053	a U -235	A	703.8E+6 Y	Tb-145	Sn-132	Nb-105	Es-250	Zn- 62
					Pr-148m	Tm-155m	U -227		
247.2	--	u Bi-214	B-	19.9 M	Tc-110	Tm-148	Tl-206m	Tl-199	Tl-195
					Au-187	Re-182			
247.79	5.9E-07	u Pa-234	B-	6.70 H	Pd-117	Te-123m	Pd-115	Cd-125m	Zr-103
247.79	2.4E-04	u Pa-234m	B-	1.17 M	Ir-189m2	Bi-198m1	Pt-187	Xe-116	Tm-159
					U -229	Eu-154	Tb-154m2	Tb-154m1	I -123
					Os-175	Rb- 84m	Lu-183	Hg-189gm	Bi-198m2
249.22	4.0E-03	u Pa-234	B-	6.70 H	Er-158	Am-237	Ge- 82	Ni- 69	Rh-109
					Ba-147	Pm-135			
249.4	0.038	a Ra-223	A	11.435 D	Pr-151	Ba-131			
249.6	=7.3E-03	a Th-227	A	18.72 D	Se- 88	Tb-153	Po-207	Lu-177m	Lu-177

Energy 249.6 ～ 266.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
249.6	7.8E-04	a Th-231	B-	25.52 H	Hf-177m1	Mo-105	Br- 77	Xe-135	As- 77
					Ag-113m				
250.35	2.8E-04	a Fr-223	B-	21.8 M	Nd-133	Dy-167	Nd-152	Tm-167	Rn-211
250.35	0.425	a Th-227	A	18.72 D	Hg-185gm	Cl- 39			
250.45	6.5E-04	a Th-231	B-	25.52 H	Ru-111	Zr-104	Te-129	Xe-142	Pb-192
251.1	0.041	a Ra-223	A	11.435 D	Tb-163	Ce-146	Rn-208	Au-185	Ba-146
					Cm-244	Pr-150			
251.5	< 0.04	a U -235	A	703.8E+6 Y	Au-187	Au-183	Ce-132	Pr-131	Yb-175
					In-120	Hg-186	Rb-101	Ir-195m	
251.8	0.067	a Ra-223	A	11.435 D	Dy-165m	Tb-151	Kr- 76	Tc-105	Hf-164
252.6	0.095	a Th-227	A	18.72 D	Ac-229	In-127m	Er-159	Sb-127	Hg-191
					Kr- 93	Yb-158	Hg-191m		
252.61	0.249	t Tl-208	B-	3.053 M	Xe-121	Tm-159			
252.8	3.0E-03	u Bi-214	B-	19.9 M	Am-245	Cf-249	Re-184	Re-184m	Ta-184
					Ho-159	Au-191m	Tc- 95m	Nd-155	Pb-196
253.73	0.011	u Th-230	A	7.538E+4 Y	Ba-124				
					Zr-100	Rh-115	Dy-147m	Dy-149	Kr- 93
					Nb- 99m	Ac-226	In-118m2	Sb-118m	Se- 73m
					Fr-226				
253.8	8.5E-04	u Th-230	A	7.538E+4 Y	La-129	Re-172m	Re-172	Sr-102	Au-191
					Zr- 97	Ir-185	Rn-221		
254.68	8.7E-05	a Fr-223	B-	21.8 M	Dy-153	Ce-137m	Rb- 77	Au-185	Cm-243
254.68	0.728	a Th-227	A	18.72 D	Sm-159	Eu-149	Pd-113	Zr- 83	Hf-177m2
					Ir-183				
255.16	--	u Bi-214	B-	19.9 M	Cf-251	Sn-113	Eu-136gm	Pt-185gm	Pr-139
255.23	0.052	a Ra-223	A	11.435 D	Nd-153	Ba-142	Tl-194m		
255.6	5.5E-03	a Ra-223	A	11.435 D	Pu-246	Au-193	Nd-151		
255.77	0.112	a Pa-231	A	3.276E+4 Y	Au-200m	Pt-186			
256.25	3.1E-04	a Fr-223	B-	21.8 M	Fr-210	Er-151	Re-182	At-206	Pd-119
256.25	6.91	a Th-227	A	18.72 D					
257.2	8.2E-05	u Pa-234	B-	6.70 H	Rn-224	Ca- 50	Sc- 50m	Dy-152	Re-183m
					In-128m	Pb-200	Mo- 90		
257.52	0.03	t Ac-228	B-	6.15 H	Cs-119	Tm-148	I -119	Ba-126	Au-180
					Tb-145	Os-196			
258.26	0.073	u Pa-234m	B-	1.17 M	Pm-140m	Au-193m	Hg-193m	W -189	Ho-170
					Tb-141	Pr-149	Ra-227		
258.44	2.4E-03	a Pa-231	A	3.276E+4 Y	Ir-189m1	La-146m	Xe-138	Pu-237	La-146
					Np-233	In-126m			
258.87	0.524	u Pb-214	B-	26.8 M	Hg-185gm	Rh- 97m	Ag-113	Gd-143	Hg-184
					Tb-164	Sr- 83m	Se- 88	Ru- 92	Rh-111
					Ba-144	Cs-119	Tl-198m2	Pb-198	
260.19	0.188	a Pa-231	A	3.276E+4 Y	La-135	Tl-198m1	Tb-162	Cd-126	Se- 81m
					In-105				
260.48	--	c Pb-204	NG		Zn- 62				
260.5	6.9E-03	a Ra-223	A	11.435 D	Br- 71	Po-209	Rn-224	Cd-115	Tl-198m2
262.27	5.0E-03	u Ra-226	A	1600 Y	Fe- 49	Sb-109	Po-205	Ag-101	Yb-169
					Ta-168	Tl-182	Ac-224	Te-133m	Pu-237
					Nd-155	Au-195m	Hg-195	Hg-195m	Ac-229
					Cf-251	Nb- 88m	Lu-164	Tb-155	Rh-100m
					Hg-188	Mo- 87			
262.91	6.2E-05	a Fr-223	B-	21.8 M	Br- 91	Po-209	Ru-105	Pm-135m	Os-181m
262.91	0.093	a Th-227	A	18.72 D	Mo- 93m	Cs-117	Se- 70	Ru-113	Sm-157
263.58	0.04	t Ac-228	B-	6.15 H	Os-182	Cm-244	Np-240m	Cs-143	Zn- 79
					Zr-104	Cd-113m	Nb- 99m	Np-231	Ag-123
					Tm-160	Au-196m2	Re-182	Ta-182	Tm-160m
265.	--	u Bi-210	A	5.013 D	Ag-116m	Ge- 77	Ag- 99	Ce-146	Ge- 75
					Rn-221	Au-182	Tm-167	Rn-205	Se- 68
					Bk-247	Np-242	Pd- 97	Dy-157	Ge- 80
					Ce-135	Bi-210m	Pm-157	Tl-206m	
266.45	6.0E-03	a U -235	A	703.8E+6 Y	Rn-224	Bk-245	Yb-180	Pa-230	Cf-251

Energy 267.1 ～ 282.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Ho-158m2	Zr- 85	Pm-133	Tm-167	Ho-156
						Ir-178	Cf-249			
267.1	--	a Th-227	A	18.72	D	Te-135	Cs-129	Kr- 93	Ag-103	Y - 93
						Cd-115	Tc-111			
267.12	2.8E-04	u Pa-234	B-	6.70	H	Sm-139m	Eu-139	Pm-156		
267.62	1.2E-03	a Th-231	B-	25.52	H	U -237	Nd-149	Gd-146		
268.	5.6E-03	a Th-227	A	18.72	D	Po-207m	In-120m2	Ba-135m	Au-193	Mo-108
						Au-191	Ru-107	Pb-200		
268.8	0.02	u Bi-214	B-	19.9	M	Mo- 89m	Sm-156	Y - 98	Pm-137	Pt-191
						Pt-197	Lu-177m	Ce-147	Hf-179m2	Ir-197gm
						Mo-106	Mo-105	Hf-171		
269.46	13.7	a Ra-223	A	11.435	D	Ac-223	Ni- 56	Pb-192	Ce-148	Ba-146
						Pa-238	Au-193			
270.25	3.46	t Ac-228	B-	6.15	H	Pm-133	Pm-135m	Cf-251	Po-204	Am-246m
						W -166	Hg-185gm	Nd-149	Ge- 75	Kr- 76
						U -232	Pa-228	W -175	Cs-124m	Ba-124
270.7	2.7E-05	a Fr-223	B-	21.8	M	Pb-194	Te-119m	Ho-153m	Pd-113	As- 77
270.7	0.036	a Th-227	A	18.72	D					
271.23	4.4E-05	a Bi-215	B-	7.6	M	Pd-118	Eu-152m1	Tb-152	Cs-117	Sc- 44m
271.23	10.8	a Rn-219	A	3.96	S	Lu-165	Rb-101	Tm-159	Ir-183	Np-240
						Hg-187gm	Kr- 76	Ce-131	Au-191	
272.28	1.7E-03	u Pa-234	B-	6.70	H	Nb- 88	Fm-253	Pm-133	Gd-143m	I -134m
						Ho-157	Sm-143	Ba-124	Pt-184m	Po-201m
						Gd-149	Rb- 89	Tc-105		
272.93	6.2E-05	a Fr-223	B-	21.8	M	Cs-143	Sn-108	Se- 88	Tm-174	Lu-174m
272.93	0.473	a Th-227	A	18.72	D	Ge- 66	Au-184	Bi-200m1		
273.14	0.06	a Pa-231	A	3.276E+4	Y	Am-237	Cd-117	Zn- 60	Ba-128	
273.8	0.15	u Bi-214	B-	19.9	M	Ir-182	Cs-136	Sm-139	Ce-148	Eu-142m
274.1	3.0E-05	a Th-231	B-	25.52	H	Xe-118	Nd-156	Tl-198m1	Hg-191m	La-147
						Os-182	Te-117m	I -117	Lu-166	
274.8	0.474	u Pb-214	B-	26.8	M	Tl-196m	Dy-153	Sr- 91	Hg-192	
275.04	3.1E-04	u Pa-234m	B-	1.17	M					
275.04	1.5E-04	u Pa-234	B-	6.70	H					
275.13	0.042	a U -235	A	703.8E+6	Y	Tm-163	Br- 73	Pm-151		
275.43	7.0E-03	a U -235	A	703.8E+6	Y	Zn- 76	Nd-147	Rh-111	Ho-162m	Re-189
						Se- 81m	Se- 81	Ba-133m	Kr- 81	Kr- 77
						Rh-109	Lu-166	Re-182		
277.32	0.069	a Pa-231	A	3.276E+4	Y	Ba-133	Ir-180	Rh- 99m	C - 16	Ba-141
						Pm-149	Eu-149	Tb-152m	Ge- 78	Hf-177m2
277.36	2.27	t Tl-208	B-	3.053	M	Ra-227	Er-171	Tb-164		
277.72	--	t Tl-208	B-	3.053	M	Rh-107	Np-239	Am-239	Cm-243	Au-191
278.24	--	c Cu- 63	NG			Rh-115	U -229	Cm-247		
278.3	6.6E-05	u Pa-234	B-	6.70	H	Nd-155	Pd-116	Ag-111m	Te-129	Nd-152
						Cs-129				
278.95	0.191	t Ac-228	B-	6.15	H	La-133	Zn- 79	Lu-167	Pt-197m	Au-197m
						U -229	Ce-132	Tl-195	Ho-171	Hg-203
279.5	= 0.27	a U -235	A	703.8E+6	Y	Rn-221	Sr- 96	Ge- 75m	Ba-146	Se- 75
279.72	0.061	a Th-227	A	18.72	D	Ge- 75	Dy-165	Tm-152	Pm-154m	Ho-157
						Y - 97m1	Sm-134	Pa-228	Rh-105	Cs-121m
280.6	--	u Bi-214	B-	19.9	M	Dy-146	Am-237	Pt-188	Gd-142	Au-191
						Ag-105	Ag-105m	Os-193	Ho-166m	Np-233
						Cs-147	Yb-157			
280.95	0.06	u Bi-214	B-	19.9	M	Pt-186	Re-175			
281.	--	a Th-227	A	18.72	D	Fr-211	Kr- 85m	Sr- 85m	In-122m2	I -123
281.29	0.158	a Th-227	A	18.72	D	Ba-126	Te-129	Eu-149	Zn- 78	
281.42	=6.0E-03	a U -235	A	703.8E+6	Y	Cs-148	Re-182	Zn- 76	Re-183m	As- 77
						W -179m				
282.	--	u Bi-214	B-	19.9	M	Lu-177m	Hf-177m1	Np-232	Md-255	Pm-135m
282.	0.072	t Ac-228	B-	6.15	H	Pt-187	Ac-231	Br- 71		
282.92	5.0E-03	a U -235	A	703.8E+6	Y	Ir-183	Yb-175	Fr-206	V - 53	Tl-198m1

Energy 283.6 ～ 300.0 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
					Ho-162m	Cu- 61	Sn-110	Tm-148	Bi-196m2
					Ir-192	Tb-152m			
283.69	1.7	a Pa-231	A	3.276E+4 Y	La-147	Gd-161	Ra-227	Pd-118	Tb-144m
284.4	0.024	a Th-227	A	18.72 D	Tl-199	La-128	Pb-205m	Ac-223	I -131
					Gd-142	In-131m2	Ba-146	Ce-145	Hg-190
					Ga- 73				
285.5	0.047	a Th-227	A	18.72 D	Pr-152	Os-173	Ir-173m	Ir-173	Am-247
					Lu-166m1	Ra-230	La-131	Lu-173	Pr-131
					Np-239	Cm-243	Au-196m2	Am-239	Ac-223
286.12	6.2E-05	a Fr-223	B-	21.8 M	Sm-135	Pm-149	Pm-137	Gd-151	Nd-137m
286.12	1.52	a Th-227	A	18.72 D	Ba-145				
286.55	0.01	a Pa-231	A	3.276E+4 Y	Po-206	Br- 75	Re-182	Sm-136	Tl-184
					Y - 93	Tc-112	Xe-142	Cs-127	Rn-208
					As- 69	Tb-151			
288.18	0.158	a Ra-223	A	11.435 D	Au-185	Cm-247	Er-148	Np-243	Gd-163
					Ar- 46	Au-183	Pm-148m	Kr- 94	
288.2	0.337	t Bi-212	A	60.55 M	Rh-107	Xe-122	I -135	Er-151m	Hg-185gm
289.5	3.1E-03	a Fr-223	B-	21.8 M	Nd-134	Ta-175	W -179m	Tm-159	Pb-200
289.5	--	a Th-227	A	18.72 D	Pb-204m	Pt-181	Cr- 58	Rb- 98	Rb- 98m
289.56	=7.0E-03	a U -235	A	703.8E+6 Y	Ce-148	Dy-146m	Ho-146	Xe-139	Pd-111
					Ce-147	Pb-200	Re-179	Se- 81	La-133
					Dy-159	Gd-159	Ir-195m	Pb-198	Ge- 81m
291.2	--	a U -235	A	703.8E+6 Y	Ru- 95	Dy-149m	Dy-166	W -188	Sb-127
					Sm-156	Cf-251	Ho-172	La-133	Ba-143
					Pm-133				
291.65	0.038	a U -235	A	703.8E+6 Y	Tc-107	Os-172	Ba-144	Ce-148	Ta-183
					Se- 69	Po-208	Xe-142	Cs-147	
292.41	0.066	a Th-227	A	18.72 D	Pr-131	Zr- 85m	Ir-189m2	Tb-161	Hg-185gm
292.7	6.2E-03	t Ra-224	A	3.66 D	Ho-147	Br- 75	Cd-119	Yb-176m	Bi-197
293.15	4.6E-05	a Fr-223	B-	21.8 M	Ra-221	Pa-238	Ce-143	Se- 88	Gd-141
293.6	8.0E-04	a Bi-215	B-	7.6 M	Au-191	Ir-194	Au-194	Se- 70	
293.6	0.073	a Rn-219	A	3.96 S					
293.79	4.8E-03	u Pa-234	B-	6.70 H					
293.8	0.066	a Ra-223	A	11.435 D	Ge- 78	Ce-149	Pm-132	Cf-247	Ce-134
					Pm-134	Nd-152	W -171		
295.22	19.3	u Pb-214	B-	26.8 M	Tb-164	Xe-117	Ir-190	Tb-143	Ba-146
					Ru-103	Pd-103	Rh-101	La-148	Hf-177m2
					Ag-110				
295.91	2.3E-04	u Pa-234	B-	6.70 H	Hf-171	Mo-108	Am-245	Rh- 99	Cf-249
					Ce-135m	Ho-153	Au-190	Er-171	
296.	0.017	u Tl-210	B-	1.30 M	Er-158	Ir-192m1	Ir-192	Au-192	Nb-102m
					Ir-173m	Pr-135	Tm-165	Te-112	Pm-157
296.51	6.6E-06	a Fr-223	B-	21.8 M	Pd-101	Re-179	Rh-115	Xe-139	Gd-140
296.51	0.449	a Th-227	A	18.72 D	Kr- 74	Y - 97	Ir-186	Er-151m	Re-186
					Hf-173	Sb-134m	Th-224		
297.81	--	u Bi-214	B-	19.9 M	Dy-157	Br- 77	Sb-126	Ga- 73	Tm-165
					Hg-189gm	Pr-152	Er-163	Fe- 61	
298.	5.2E-05	u Po-214	A	164.3 US	Xe-137	Ba-146	Es-249		
298.1	2.1E-05	u Pa-234	B-	6.70 H	Ag-117m	C - 16	Ag-113m		
298.58	--	c Cd-113	NN		Te-114	Hg-187gm	Tb-160	Ag-113	Dy-144
					Au-186	Gd-149			
298.76	< 0.02	u Pb-214	B-	26.8 M	Pu-237	Pt-181			
299.1	6.4E-04	u Pa-234m	B-	1.17 M	Ho-163m	Sr-100	Pm-133	Np-233	In-132
					Sm-136	Tm-153	Eu-139	Pb-187m	Kr- 79
300.	3.1E-04	a Fr-223	B-	21.8 M	Ir-197gm	Tm-163	Sm-158	U -240	Xe-116
300.	2.63	a Th-227	A	18.72 D	Sm-134	W -171	Pt-179		
300.07	2.47	a Pa-231	A	3.276E+4 Y	Ce-135				
300.09	3.28	t Pb-212	B-	10.64 H	Ra-227	Os-177	Cu- 67	Ga- 67	Pt-187
					Ir-189m1	Ir-189m2	Hg-180	Pt-189	Tl-195
					Xe-121	Ir-194	Ce-134		

Energy 301.7 ～ 319.2 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
301.7	=5.0E-03	a U -235	A	703.8E+6 Y	Ru- 95	Ag-124	Mo-107	Tl-196m	Pr-148
					Pm-144	Au-190	Os-174	Rn-206	
302.65	2.87	a Pa-231	A	3.276E+4 Y	Pb-196	Gd-162	La-133	Os-192m	Pd-116
					Pr-138m	Rh-107	Pm-136m	Xe-133	Ba-133
					Lu-163	Np-240m	Cm-244	Pr-133	Ce-132
					Ba-145	Sb-130	I -117	Es-250	
304.2	< 0.042	u Bi-214	B-	19.9 M	Er-157	Ru-111	Pd-115	Re-183m	Se- 75
					Ba-141	Zr- 83	Sn-131gm		
304.52	1.3E-04	a Fr-223	B-	21.8 M	U -242	Bi-210m			
304.52	1.21	a Th-227	A	18.72 D					
304.9	5.9E-07	u Hg-206	B-	8.15 M	Pt-187	Ba-140	Kr- 85m	Zn- 62	
304.9	--	u Bi-210	A	5.013 D					
305.26	0.031	u Pb-214	B-	26.8 M	Hg-183	Cs-147	Tl-190m	Rh-115	Pr-131
					Ac-223	Gd-159	Re-170	Th-225	Zn- 77
306.88	94.	Lu-176	B-	3.78E10 Y	Rh-105	Pm-135m	Ag-105m	Rn-227	Cs-143
					Ir-195m	Hg-192	Ge- 83	Kr- 74	Hf-173
					Sm-139	Rn-208	Cu- 73	Hf-166	Tc-101
					Pr-140	Ac-231	Sn-129m	Cs-123	Os-192m
					Er-151m	Cs-146	Gd-151	Ta-186	Bk-249
308.4	1.9E-04	a Fr-223	B-	21.8 M	Yb-169	Tl-197	Cd-105	Pb-197m	Tc- 95
308.4	0.013	a Th-227	A	18.72 D	Xe-119	Os-175	Os-196	Pu-245	Cr- 48
					Ir-192	Au-192			
308.6	3.3E-05	u Pa-234	B-	6.70 H	Xe-114	Xe-142	Tl-197		
308.78	3.9E-04	a Th-231	B-	25.52 H	Th-236	Np-241	Re-179	Ir-181	Pt-179
					Pr-134m	Ho-145	Au-185	Ba-142	Tb-143
310.	1.5E-03	a Pa-231	A	3.276E+4 Y	Pb-187m	Ho-159	Sr-100	Kr- 76	Nb-105
					Pa-228	U -227			
310.2	1.2E-04	u Pa-234	B-	6.70 H	Kr- 72	Pa-237	Dy-167		
310.52	2.1E-07	u Pa-234	B-	6.70 H	Pb-205m	Xe-121	Co- 65	Au-185	
310.52	8.7E-05	u Pa-234m	B-	1.17 M					
310.69	=4.0E-03	a U -235	A	703.8E+6 Y	Xe-116	Ge- 80	Er-158	Fe- 64	
311.	2.9E-03	a Th-231	B-	25.52 H	Ta-174	Rh-101m	At-205	Hf-173	Sn-130m
					Pd-109	Hf-177m2	Fr-212	Po-206	In-114m2
					Rh- 94	Ta-166	Cm-251	Pt-187	
312.69	2.4E-04	a Fr-223	B-	21.8 M	Kr- 77	Zn- 80	Te-133	Np-233	Cs-147
312.69	0.473	a Th-227	A	18.72 D	Pt-183m	Rh-107	Ag-117	K - 42	Sc- 42
312.92	0.102	a Pa-231	A	3.276E+4 Y	Ho-145	Ta-183	Au-183	Hg-185gm	
313.5	1.6E-04	u Pa-234	B-	6.70 H	Pb-195m	Ta-183	Pu-237	Gd-140	
313.59	0.031	a Pb-211	B-	36.1 M	Rb- 75	In-121m	Sm-136	Hf-164	Lu-163
314.32	0.078	u Pb-214	B-	26.8 M	Sb-128m	Cs-119	Cs-119m	Rn-210	Sb-128
					Tc- 96	Sn-117m	Se- 68		
314.78	2.5E-05	a Fr-223	B-	21.8 M	Ag-121	Pr-147	Er-161	Ir-192	Pa-230
314.78	0.437	a Th-227	A	18.72 D	V - 55				
314.9	--	u Bi-214	B-	19.9 M	Gd-161	Tm-164m	Ho-145	Tb-144m	Tm-155m
					In-117m	In-129m	Er-148	Hg-185gm	Os-196
					Pr-133	Kr- 76			
316.7	1.6E-04	u Pa-234	B-	6.70 H	Ra-219	Hf-183	Np-239	In-126m	Hf-179m2
316.7	1.8E-04	u Pa-234m	B-	1.17 M	Sr- 80	Po-202	Es-254	Ag-113m	Au-196m2
					W -170	Ag-113	I -134m	Ba-146	Pr-149
					Pt-183m	Ru-105	Rn-208	Tc- 96	Lu-180
					Ir-192	Au-192	Pm-133	Ce-146	Yb-152
317.1	=1.0E-03	a U -235	A	703.8E+6 Y	Rh-114m	Ce-131m	Lu-163	Ac-229	Pt-199
					Sm-157				
317.87	8.0E-05	a Th-231	B-	25.52 H	Tl-189m	Pt-189	Pd-103	Sr- 79	Ru-103
					Bi-198m1				
318.1	3.4E-03	a Pa-231	A	3.276E+4 Y	Re-184m	Ta-184	I -131	Pr-151	Cs-129
318.46	6.1E-03	a Th-227	A	18.72 D	Zn- 69	La-129	Ta-182m2	Au-195m	Ge- 69
					Ta-172				
319.2	6.9E-03	a Fr-223	B-	21.8 M	Rh-105	Hf-175	Ir-181	Au-190	Cs-147
319.2	0.032	a Th-227	A	18.72 D	Lu-177m	Ag-105m	Ag-105	Cs-147	Nd-156

Energy 320.1 ～ 338.3 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
320.15	1.1E-04	a Th-231	B-	25.52	H	I -121	Ir-195m	Zr- 84	Yb-160	Ra-221
						Cr- 51				
320.4	8.2E-05	u Pa-234	B-	6.70	H	Ho-152m	Xe-119	Ho-158gm	Se- 73m	I -119
						Lu-162	Pu-237	Re-183m	Kr- 94	Cs-121m
						Hg-189gm	Np-233	Am-237		
321.65	0.226	t Ac-228	B-	6.15	H	Sb-125	Au-189m	In-104	In-128m	Cf-249
						Y - 97m2	Sm-158	Ho-167	Lu-177	Th-225
						Dy-144	Cs-127	Os-193	Rh-107	Rh- 99m
						Mo-105	Pu-243	Tc- 99m	Ce-149	Rh- 99
323.83	0.028	u Pb-214	B-	26.8	M	Hg-187gm	Mo- 90	Tm-155m	Dy-153	Tm-167
323.87	3.93	a Ra-223	A	11.435	D	Kr- 93	Pd-117	Ir-194m2	Sr- 79	Cd-121
						Pr-131				
324.9	<6.5E-03	a Rn-219	A	3.96	S	Sm-141	Tb-146m1	Ru- 97	Cs-138m	Sm-158
						Au-180	Rn-206	Pm-135m	Lu-168	Dy-146
						Ce-148				
324.94	=4.9E-03	a Th-227	A	18.72	D	Os-174	Pb-191m	Rh-101	Ba-145	Hg-185gm
						Rn-208	Cd-126			
325.8	=4.0E-04	a U -235	A	703.8E+6	Y	Ho-155	Rh-109	Ag- 96	Hf-178m1	Hf-178m2
						In-108	Lu-178m	Ga- 73	Nd-138	I -131
						Cs-147				
326.04	0.033	t Ac-228	B-	6.15	H					
326.11	= 0.024	a Th-227	A	18.72	D	Pd-119	Ag-115	Dy-157	Sn-106	Ho-154
						Au-196	Tl-191m	Nd-149	Mo-106	
327.13	0.038	a Pa-231	A	3.276E+4	Y	Y -102m	Y -102	Hf-177m2	As- 71	Sm-158
						Tl-188m1	Ru-112	Sb-114	Bk-249	
327.44	0.12	t Ac-228	B-	6.15	H	Np-232	Pu-245	Eu-149	Yb-160	Pa-228
						Hf-177m1	At-204	Cs-147		
328.	2.95	t Ac-228	B-	6.15	H	U -232				
328.03	0.125	t Bi-212	A	60.55	M					
328.12	1.4E-03	a Tl-207	B-	4.77	M	Po-200	Bi-207	Sc- 42m		
328.12	9.0E-06	a Po-211	A	0.516	S					
328.4	0.206	a Ra-223	A	11.435	D	Ca- 38	Ba-126	Gd-151	Rn-224	Cd-115
						Ca- 50	Ir-194	Ir-194m2	Au-194	Rh-116m
						Rb- 95	Y - 96	Er-155	La-140	Ra-222
						Lu-181	Pt-183m	Au-185		
329.85	3.7E-04	a Fr-223	B-	21.8	M	Bi-195gm	Tc- 92	Sb-134m	Bi-210m	Ir-192
329.85	2.66	a Th-227	A	18.72	D	I -118m	Rn-207	Gd-145m	Ce-132	U -242
330.06	1.4	a Pa-231	A	3.276E+4	Y	Ra-227	Xe-123	Hg-185gm		
330.4	=1.2E-04	u Pa-234	B-	6.70	H	Yb-159	Pt-200	Eu-139	Tm-176	
331.4	1.2E-04	u Pa-234	B-	6.70	H	Sb-130	Pr-133	Hg-181	Rb- 99	Fm-251
						Cs-122m2	Tl-201m	Y -100	Pb-201	Sc- 51
						Hg-191	Pb-187	Ag-105	In-131m1	Hg-191m
						Lu-178m	Pr-134m			
332.37	0.4	t Ac-228	B-	6.15	H	Sn-125m	Mg- 21	Au-185	Sn-125	Hf-180m
						U -237	Cs-146	Sb-113	Rh-101m	Rh-114m
						Au-200m				
333.31	0.08	u Bi-214	B-	19.9	M	Ir-196	Fr-228	Pr-149	Au-196	Ag-113
						Cf-249	Re-186	Ac-223	Bk-244	
333.99	0.1	a Ra-223	A	11.435	D	Tl-189	Au-198m	Ba-129	Eu-150m	Pm-150
						Eu-150	Te-136	Se- 87	V - 55	Ho-145
334.38	1.4E-04	a Fr-223	B-	21.8	M	Pr-134m	Te-133m	Te-131m	Te-133m	Np-239
334.38	1.03	a Th-227	A	18.72	D	Zn- 60	Lu-181	Rh-101		
334.78	< 0.034	u Bi-214	B-	19.9	M	Ho-154m	Ho-154	Hg-187gm	Xe-142	Fe- 59
						Pr-131	Cs-125	Tl-189m	Fr-208	Tm-158
						Nb- 98m	Pm-134m	Pt-185gm	Pb-202m	Pt-181
337.7	8.6E-03	a Rn-219	A	3.96	S	Hg-185gm	Rh-101m	Cs-118gm	Rn-209	Ru-113
						Bi-196m2	Tm-162m	Lu-179	Ag-117m	Ag-117
338.1	1.1E-03	u Pa-234m	B-	1.17	M	Ge- 75	Eu-138	Ge- 66	Gd-161	Dy-146
338.28	2.79	a Ra-223	A	11.435	D					
338.32	11.27	t Ac-228	B-	6.15	H	Pa-228	Po-206	Tb-163	Er-151m	Au-183

Energy 339.8 ～ 357.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Ir-194m2				
339.8	9.6E-04	a Fr-223	B-	21.8	M	Re-182	Yb-180	Cu- 59	Ag-113	Hf-182m
339.8	--	a Th-227	A	18.72	D	Co- 57	W -174	Sm-140	Ho-145	Er-163
						Yb-157				
340.2	6.4E-05	u Pa-234	B-	6.70	H	Co- 65	Pm-151	Th-236	Mo-108	Ir-189m2
340.2	7.0E-05	u Pa-234m	B-	1.17	M	Pm-152m1				
340.74	0.181	a Pa-231	A	3.276E+4	Y	Rh-115	Rh-116m	Rh-116	Tb-143	Sn-132
						Tb-155	Cs-147	Rh- 99m		
340.96	0.369	t Ac-228	B-	6.15	H	Cu- 76gm	Nd-133m	Te-137	Ho-157	Pb-191m
						Sm-140	Gd-162	Er-158	Nd-138	Lu-181
342.5	1.9E-04	a Fr-223	B-	21.8	M	Hf-166	Yb-157	Pm-135	Ag-111m	Ag-111
342.5	0.388	a Th-227	A	18.72	D	Kr- 92	Sn-104	Ir-183	Ag- 99m	
342.9	0.219	a Ra-223	A	11.435	D	Pd-115	Cd- 99			
342.91	0.035	a Pb-211	B-	36.1	M	Cd-119	Tb-150m			
343.5	=3.0E-03	a U -235	A	703.8E+6	Y	Hf-175	As- 82m	Tm-176	Pb-187	Dy-166
						Tc-103	Tb-141			
343.8	5.4E-05	u Pa-234	B-	6.70	H	Ba-141	Am-240	Er-149	Er-149m	Rh-101
344.3	1.2E-08	u Hg-206	B-	8.15	M	Hf-182m	Bi-210m	Tb-152m	Eu-152	Tb-152
						Cd-117	Ag-105	Rn-207	Tm-156	I -136
						Pm-151	Hf-184	Au-182	Zn- 65	Pa-228
345.9	0.038	a U -235	A	703.8E+6	Y	Se- 85	Nd-153	Pm-133	Po-207	Rb- 91
						Rb- 76	Hf-181	Cm-247	Mn- 52	Er-150
346.45	9.7E-03	a Th-227	A	18.72	D	I -123	Tc-103	Ce-133	Zn- 74	Bi-202
						La-129	Ho-167	Tm-167	Pt-197m	Ho-154m
346.8	= 0.178	a Ra-223	A	11.435	D	Gd-149	Eu-138	Tb-154m2	Hg-186	I -136m
						Te-114	Co- 60	Tm-165	Cd- 98	Hf-171
						Tb-147	In-109	Hg-185gm		
348.5	6.1E-03	a Th-227	A	18.72	D	Er-157	Tb-163	Ir-183	Dy-159	Au-189
						Gd-159	Lu-168	Pt-181	Tm-159	Bi-200
						Yb-178	Np-231	Nb-105	Sb-130m	Ta-175
						Rh-112	Rh-112m	La-129		
348.92	0.12	u Bi-214	B-	19.9	M	Hg-185gm	Re-174	Hg-186	Cd-121	Es-250
						Pd-118				
350.43	0.112	a Th-227	A	18.72	D	Fm-251	Sm-135	Eu-149	Rn-208	Xe-122
						Cs-147	Re-172	Re-172m	Bk-245	Rb- 79
						Rn-206	Na- 21	F - 21		
351.06	12.91	a Bi-211	A	2.14	M	Lu-173	Os-178	Bi-197	Te-112	Ce-145
						Hg-207	Re-182	Gd-141m	Pt-191	Nb- 99m
						Tb-163				
351.51	7.3E-03	a Pa-231	A	3.276E+4	Y	Tl-182	Ce-146			
351.8	7.0E-05	a Th-231	B-	25.52	H	I -118	Yb-179	Au-187		
351.9	0.07	u Bi-214	B-	19.9	M	Cs-148	Re-178			
351.9	6.6E-04	u Pa-234	B-	6.70	H					
351.93	37.59	u Pb-214	B-	26.8	M	Rb- 95	Er-156			
352.36	--	c Fe- 56	NG			Dy-167	W -168	Ho-152m	Tb-149	Ag- 98
						Mn- 57	Co- 57	Ce-148	Pr-145	
352.61	2.9E-06	a Fr-223	B-	21.8	M	Sr- 92	Se- 68	Xe-142	Ge- 75	Tl-199m
352.61	0.012	a Th-227	A	18.72	D	Rh- 99	Hf-175	Pb-199	Ag-121	
354.46	0.1	a Pa-231	A	3.276E+4	Y	La-147	Gd-151	Pr-137	Au-191	Yb-157
						Cs-124	Sr- 85	Zn- 78	Tb-163	Tc-107
						In-120m2	Dy-146	Rn-205	W -174	Xe-122
356.	8.3E-04	u Tl-210	B-	1.30	M	Kr- 76	Rb- 97	In-116m1	Zr- 97	Rb- 76
356.	7.0E-03	u Bi-214	B-	19.9	M	Au-196	Ir-196	La-145	Cs-121	Ir-196m
						Ba-133				
356.03	=5.0E-03	a U -235	A	703.8E+6	Y	Ba-147	Kr- 89	Tb-156	Ir-195m	Pu-243
356.94	0.017	t Ac-228	B-	6.15	H	Se- 83m	Se- 83	Tl-186m1	Lu-165	Rh-110
						Hf-173	Hg-191m			
357.12	0.175	a Pa-231	A	3.276E+4	Y	Ba-130m				
357.5	7.9E-04	u Pa-234m	B-	1.17	M	Rb- 81	La-130	Ac-223	Pd-103	Rh-113
357.9	5.8E-05	u Pa-234	B-	6.70	H	Yb-157	Am-238	Tm-157	Br- 92	Rb- 75

Energy 359.3 ～ 380. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
					Tc-104	Ce-147	Rh-104	Zn- 79	Lu-158
					Tc-105	Ho-171	Fm-251	Xe-135	Au-181
					Pd-114				
359.3	9.0E-03	a Pa-231	A	3.276E+4 Y	Te-137	Er-155	Lu-152	Ru-109	Se- 71
					Th-225	Ba-128	Nd-133	Pm-154m	Ir-195m
					Ge- 67	Cs-142	Rh-112m	Zr- 83	Pt-191
360.6	2.8E-05	u Pa-234	B-	6.70 H	W -189	Tc-107	Cd-102	Te-127	Tm-150
					Re-181	Nd-133m	Pt-184m	Re-171	Gd-161
					Yb-157	Lu-165	Re-190	Re-190m	Ir-190
					Gd-141m	Os-190m	Ir-190m2	Pb-201	
362.	<2.6E-04	u Tl-206	B-	4.199 M	Rn-208	Dy-165m	Yb-155	Dy-165	Sm-158
					Ag-121	Rh-114	Rh-114m	La-123	Po-199m
362.06	0.045	a Ra-223	A	11.435 D					
362.07	0.043	a Pb-211	B-	36.1 M	Pm-135	Kr- 88			
362.5	4.6E-03	a Th-227	A	18.72 D	Tb-143	Np-241	Pr-133	Au-184	Hf-179m2
362.8	6.8E-04	u Pa-234m	B-	1.17 M	Ir-178	Kr- 85	Sr- 85	Yb-164	Sm-135
					Rb-101				
363.47	7.8E-03	u Bi-214	B-	19.9 M	Re-168	Y - 96m	Cs-132	Dy-159	In-124m
					Sm-158	Lu-174m			
363.84	7.8E-03	a Pa-231	A	3.276E+4 Y	Tm-174	Tm-175	Cf-247	Cd-115	Ba-142
365.	2.8E-05	u Pa-234	B-	6.70 H	I -131	As- 79	Ba-147	W -174	Zn- 60
					Br- 91	Dy-147m	Ir-189m2	Ir-195m	Tl-193m
					La-131	In-107	Rn-208	Pb-198	W -172
					Cs-147	Sr- 97	Bk-245	Cd-126	Ho-153
368.8	8.2E-03	a Ra-223	A	11.435 D	Pm-139	Pb-194	Au-200	Tl-200	Lu-166
					Tc-111	La-123	Nb-104gm	Zn- 77	Hg-195m
					Cd-100	Pm-136	Cm-249	Bi-210m	Ac-231
369.35	1.4E-03	a Fr-223	B-	21.8 M	Au-187	Nb-105	Lu-159	Ag-121	
369.35	=6.1E-03	a Th-227	A	18.72 D					
369.5	= 0.021	a Ra-223	A	11.435 D	Eu-141	Eu-141m	Hf-169	Po-207	Yb-153
369.5	4.0E-03	u Pa-234	B-	6.70 H	Fr-227	I -136m	Pm-136m	Gd-147	Ta-168
370.85	--	a Th-227	A	18.72 D	Eu-157	Ag-119	Tm-157		
370.9	< 0.011	a Rn-219	A	3.96 S	Np-231	U -237	Hg-191m	Pb-192	Rn-206
					Re-190	Ir-190			
371.68	0.48	a Ra-223	A	11.435 D	Nb- 90	Cd-123	Lu-163	Dy-166	Ag-121
372.	1.9E-03	u Pa-234	B-	6.70 H	Cs-129	Os-174	Xe-125	Tc-110	Ho-149m
					Bi-196m2				
372.57	6.7E-03	t Ac-228	B-	6.15 H	Ag-119	Sn-111	Mo-108	Tm-150	Ac-223
					Tl-191m	Te-112	K - 43	Sc- 43	Zr- 84
373.3	= 0.049	a Ra-223	A	11.435 D	Lu-165	Yb-160	Cu- 61	Xe-135	Pr-151
					Ra-232	Gd-163	Pm-136m	Re-173	Pm-136
					Rh-110	Ag-110	Ag-123	At-200gm	
374.79	1.3E-03	a Th-227	A	18.72 D	As- 69	Hg-199m	Tl-186m2	Ce-147	Ru-107
					Te-115	Os-192m	Ir-192	Ag-111	Br- 73
					Pb-204m	Ag-111m	Bi-204		
374.93	4.9E-03	a Pa-231	A	3.276E+4 Y	Tm-159	Xe-127	Ba-128	Te-127	Yb-180
					Pu-239	Es-249	Ir-181		
375.59	4.6E-03	u Bi-214	B-	19.9 M	Cs-127	Sr- 76	Pb-197	Ta-163	Tl-191m
376.	0.012	a Ra-223	A	11.435 D	Tm-160m	Fm-251	Mo-104		
376.3	--	a Th-227	A	18.72 D	Cf-247	Cd-127	Hg-187gm	Np-231	Pb-190
					I -140	Pd-111	Pu-245	Tc-109	Pd-111m
					Ta-164	La-145	Sm-136	W -174	
377.99	0.025	t Ac-228	B-	6.15 H	Br- 75	Es-252	Cs-147	Hf-166	Mn- 52m
					Zn- 75	Fe- 53	Yb-155	Ir-197gm	Ir-172m
					Hf-177m1	W -174			
379.1	6.6E-05	u Pa-234	B-	6.70 H	Tc-100	Lu-169	Sr- 80	Ba-145	Gd-140
					Tm-155m	Os-183	Ga- 73	Tb-141	
379.3	0.05	a Pa-231	A	3.276E+4 Y	Os-182	Re-183m	Pd-118	Es-249	
380.	=3.2E-05	a Rn-219	A	3.96 S	Te-114	Tb-151m	Rn-208	Xe-142	La-146m
					Ce-149	Sm-134	Tb-143	Tb-151	Sb-125

Energy 382. ～ 399.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
382.	6.2E-04	u Tl-210	B-	1.30 M	Bi-195gm Es-253 Pt-188 Pd- 95m Ru-111	Y - 87m Sr- 83 Sr- 83 Tm-176 Pb-198	Bk-245 Hg-180 Y - 94 Au-180 Am-240	I -116 I -136m Tc-112 Ge- 66	 Sn-123m Pu-243 Pm-133
382.4	7.0E-06	a Fr-223	B-	21.8 M	I -121	Sb-132	Sb-132m	Se- 86	Hg-193m
382.4	=6.1E-03	a Th-227	A	18.72 D					
382.8	0.014	a Ra-223	A	11.435 D	Tl-199m	Bi-192gm	Eu-141	Sn-113	Rh- 98m
383.52	0.046	a Th-227	A	18.72 D	Pm-251 Es-250	Gd-146 Co- 65	Er-172 Xe-133	Pa-230 Ba-133	Tl-195m Tl-192gm
384.63	6.7E-03	t Ac-228	B-	6.15 H	Te-131 Ge- 64 Sn-109	Re-184m Eu-141	Ta-184 Pt-185gm	Rn-209 Dy-146	Mo-107
384.7	3.7E-03	a Pa-231	A	3.276E+4 Y	Pr-151	Au-185	Bk-245		
385.4	6.6E-05	u Pa-234	B-	6.70 H	Au-201	Mo- 93m	Co- 55	Tm-157	Yb-180
386.77	0.31	u Bi-214	B-	19.9 M	Y - 80 Dy-151 Rn-209 Rn-206	Pb-197m Ho-167 Hg-195m Pd- 99	Pb-197 Hf-182m Cu- 70m Rn-209	Tb-152m Zn- 71m Sn-106 Ag-117m	Sr- 98 Tb-163 Sr- 81 Er-158
387.	4.9E-04	a Pa-231	A	3.276E+4 Y	Au-191	Cd-103	Pb-191m	Es-253	Br- 71
387.82	0.038	a U -235	A	703.8E+6 Y	Zr- 99 Pb-197m	Os-193 Hg-195m	Os-174	Pr-131	Ho-145
387.94	1.1E-06	u Pa-234	B-	6.70 H	Pa-232				
387.94	1.4E-03	u Pa-234m	B-	1.17 M					
388.	0.015	a Ra-223	A	11.435 D	As- 81	Au-202	Cf-249	Ba-144	Rh-112m
388.88	0.37	u Bi-214	B-	19.9 M	Tb-142 Sr- 87m Cs-126	Y - 87 Sb-111	Tb-149 Ag-115m	Tc-103 Kr- 79	Ag-108
389.12	0.01	t Ac-228	B-	6.15 H	Tb-141 Yb-160	Es-253 Dy-153	Gd-141m Ho-148m1	Yb-176m Na- 25	Fr-208 Al- 25
390.3	0.04	a U -235	A	703.8E+6 Y	Tb-163 Yb-159	Au-185 Au-191	Zn- 71m Nd-136	Pb-202m	Zn- 71
390.4	6.9E-03	a Ra-223	A	11.435 D	Ir-184 Yb-178	Tl-198m1 Ir-194m2	Au-187 Pr-138m	Rn-208	Yb-164
391.6	7.8E-03	a Pa-231	A	3.276E+4 Y	Mn- 61	Mo-108	Lu-163	Pd-111m	Er-157
392.4	9.7E-03	a Th-227	A	18.72 D	In-130m1 Te-113 Ag-113m Ba-146	Fr-227 Tc- 93m Ba-129m Ce-131	Y - 83 Kr- 73 Si- 35 Ir-183	In-113m Pt-199m Ho-162 Ag-105	Sn-113 Hg-184 Zr- 88
393.5	0.011	a Ra-223	A	11.435 D	Hg-186	Cs-117	Ta-175	Pr-152	Pt-179
394.05	0.015	u Bi-214	B-	19.9 M	Ru-105 Cs-116 Ho-150m Zn- 62	Rb- 77 Ir-196m Ir-182	Au-196 Cu- 67 Eu-141m	Pb-187 Ga- 67 Eu-141	Se- 73m Ru- 91 Tm-175
394.1	1.5E-04	u Pa-234	B-	6.70 H	Xe-142	Pm-135m	Pb-195m	Pt-184	Sm-157
395.5	2.2E-03	a Pa-231	A	3.276E+4 Y	Ta-185 S - 39 Tb-151	Ta-169 Kr- 94 Tl-194	Tb-148m Ac-234 At-206	Y - 97m2 Eu-141	Ce-131 Eu-141m
396.01	0.029	u Bi-214	B-	19.9 M	W -166 Gd-163	Gd-147 S - 39	Ta-163 In-102	Yb-175 Pa-238	Sn-108 Xe-138
397.7	4.3E-05	u Pa-234	B-	6.70 H	Y - 97m2 K - 43 Re-190 La-144	In-117 Mo- 87 Re-190m Kr- 79	Pm-132 Ir-190 Rb- 79	Dy-150 Al- 29 Pb-198	Lu-168 P - 29 Pa-230
397.94	0.027	t Ac-228	B-	6.15 H	Hf-183	Hf-164	Bi-206		
398.14	8.8E-03	a Pa-231	A	3.276E+4 Y	V - 52 Rh-110m	As- 69	Rh-116	Rh-116m	Ho-152m
399.	=2.4E-03	a Th-227	A	18.72 D	Zn- 71 Eu-138	Ho-167 Ir-175	Pm-135m Ag-119	Hg-185gm Zn- 77	Hg-189gm Se- 69
399.62	0.029	t Ac-228	B-	6.15 H	Nb- 88m	Nb- 88	La-147	Es-252	Pd- 99

Energy 401.1 ～ 426.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Ag-119	Ac-234	Ge- 75m	Mo-107	Lu-163
401.1	0.329	Lu-176	B-	3.78E10	Y	Zr-100	Lu-165	Se- 75	Mg- 28	Pt-187
						Br- 73	Bi-196	Lu-168	Lu-167	Sn-104
						Xe-138				
401.8	5.8E-05	u Pa-234	B-	6.70	H	Se- 73m	Tc-103	Ba-124	Ho-145	
401.81	8.0E-06	a Bi-215	B-	7.6	M	Re-179				
401.81	6.37	a Rn-219	A	3.96	S					
402.5	9.5E-06	a Fr-223	B-	21.8	M	In-109m2	Pt-179	Cm-247	Pd-117	Kr- 87
402.5	--	a Th-227	A	18.72	D	Kr- 94	Au-181	Tl-186ml	Rn-207	Pt-181
						Nd-133m	Pm-139	Nb- 88	Tb-141	Gd-162
						Tc-103				
404.2	2.2E-03	t Ra-224	A	3.66	D	Tl-199	Er-151m	Sm-141	Pt-189	Tl-194
						Pb-191m	K - 43	Sn-128		
404.85	3.78	a Pb-211	B-	36.1	M	Rh-108	Nd-139	Hg-180	Fm-253	Ge- 83
= 404.85	--	a At-215	A	0.10	MS					
405.74	0.17	u Bi-214	B-	19.9	M	Tl-186ml	I -134	Cs-147	Fm-251	Po-207
						Rh-106m	Ho-158m2	Pb-201	Th-235	Ag-106m
						Xe-142	Kr- 76	Eu-150m	Pm-150	
407.81	0.036	a Pa-231	A	3.276E+4	Y	Ho-154m	Cf-247	Y - 97ml	Ag-119	In-122m2
						Re-190m	Ir-190	Er-172	Sb-116m	Ir-198
						Te-133	Hg-193m	Am-237	Bk-245	Os-196
						Lu-180	Ra-227	Xe-135	Te-114	Y - 81
						Se- 84	Tc-112	Sm-137	Rn-209	Tm-159
409.46	1.92	t Ac-228	B-	6.15	H	Se- 88	Bk-245	Cs-138m	Cs-138	Pt-197m
						Au-197m	Hg-197m	Eu-157	Pr-134	Pr-134m
						Rh-113	At-200gm	Pm-133	Pt-191	Y - 85
409.8	5.4E-04	u Pa-234	B-	6.70	H	Hf-179m2	Zn- 75	Ag-123	Pm-155	La-146
						Os-175	Th-224	Fm-251		
410.29	-3.0E-03	a U -235	A	703.8E+6	Y	Hf-162	Sn-129			
410.3	3.2E-03	a Pa-231	A	3.276E+4	Y	Tb-164	Fr-228	Pm-137	Cl- 39	Eu-157
						Yb-179	Ho-166m	Co- 54m	Os-177	Tb-152
						Eu-152	In-130ml	Ho-150m		
414.6	3.0E-04	u Ra-226	A	1600	Y	Ba-146	Lu-177m	Pu-239	Au-191	Sr- 79
						Se- 70	Rn-208	Pm-133	Er-151m	Ta-184
						Eu-148	Pm-148m	Sr- 80	Cs-121m	Pb-192
						Rb- 96	Nd-133	Sb-126ml	Xe-142	Sr- 76
						Sb-126				
415.13	1.6E-03	a Th-227	A	18.72	D	Kr- 72	Tb-163	Ra-221	Zr- 99	
415.2	0.143	t Pb-212	B-	10.64	H	Pd-109	Ru-110	Re-179	Pd-111m	Au-186
						Hg-205				
416.1	5.8E-05	u Pa-234	B-	6.70	H	Ga- 82	Ba-148	Yb-164	Cm-251	Si- 33
						Rn-227	Hg-185gm			
416.3	0.013	t Ac-228	B-	6.15	H	Zr- 85	Ge- 77	Tl-190	Tl-190m	In-107
						Zr- 85m	Dy-146m	Ho-146	Xe-122	Tm-149
						In-116ml	W -189	At-203	Th-235	W -177
419.42	0.021	t Ac-228	B-	6.15	H	Es-252	Rh-102m	Lu-177m	Hf-177m1	Tl-184
						Nd-155	Sm-134	Ge- 75	Po-203	Re-172
						Ge- 77m	Pm-140m	Nd-133m	Bi-200	Yb-180
						Ba-129m	Cd-121m	Y - 83	Hg-191m	Rh-102m
422.	--	u Bi-214	B-	19.9	M	Mo-104	Os-177	Ru-111	Lu-166m1	Au-191
						La-124gm	Rh- 97m	Rh- 97	Gd-146	Bi-196m2
						Ce-148	Y - 83m	Hg-184	Tb-163	Mn- 61
422.04	3.0E-03	t Ra-224	A	3.66	D	Pb-202m	Bi-202	Cm-251	Tb-156	Cd-119m
						Tc-110	Er-155	Rb- 99	Tl-192gm	Tc-108
425.3	5.8E-05	u Pa-234	B-	6.70	H	Ta-177	Ce-132	Ho-162m	Si- 36	Ti- 45
						Fr-210	Bi-199	Fm-251	Np-233	Tl-196
						Am-237	Tl-197	Mo- 91m	Dy-166	In-125
						Se- 68				
426.95	7.3E-04	u Pa-234	B-	6.70	H	Rh-109	Se- 70	Ag-117	In-109	At-204
						Lu-178m	Hf-178ml	Hf-178m2	Ta-178m1	Au-187

Energy 427. ～ 452.7 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
					Nd-133	Tb-151	Tb-154m2	Rn-208	Ru-109
427.	6.8E-04	a Pa-231	A	3.276E+4 Y	W -177	Ge- 64	Pm-133	Ir-187	
427.09	1.76	a Pb-211	B-	36.1 M	Cs-121m	Cs-121	Pt-187		
427.4	4.9E-08	u Pa-234	B-	6.70 H	Pd- 99	Tb-163			
427.4	2.0E-05	u Pa-234m	B-	1.17 M					
428.	<2.3E-03	u Bi-214	B-	19.9 M	Br- 75	Sb-125	Gd-140	Cs-125	Cd-126
					Cd-100	Sm-135	Tl-194m	Tl-194	Po-201
					Rh-106	Cd-123m	Pb-195m	Ag-106	Nd-133
					Es-253				
430.	6.5E-03	a Pb-211	B-	36.1 M	Si- 34	Sr- 98	Ba-146	Rh-106m	Ag-106m
					Hg-185gm	Md-255	Mo-107	La-145	Re-179
430.5	0.019	a Ra-223	A	11.435 D	Po-200	Ag-121	Ba-144	Sr- 92	Ir-189m2
					Ir-197gm	Cm-241	Bk-245	Pd-115	Ga- 76
					Au-181	Ba-143	Er-163		
432.1	0.034	a Ra-223	A	11.435 D	La-144	Sm-145	S - 40	Re-190	Eu-136gm
					Sm-141m	Cu- 76gm	Ti- 45	As- 79	Y - 95
					Fe- 63	Dy-151			
432.33	4.6E-03	a Th-227	A	18.72 D	Zn- 75	Xe-142	La-140	Eu-152m1	Ce-133
433.	=4.0E-03	a U -235	A	703.8E+6 Y	Tm-155m	Ir-195m	Pr-149	Hf-175	
433.1	1.5E-04	u Pa-234	B-	6.70 H	Es-253	Tl-197	Ce-137	Cd-105	Rb- 98m
433.7	0.017	t Bi-212	A	60.55 M	Lu-154	Ce-131	Tb-143	Sb-131	Fr-227
					Eu-141	Eu-141m	Ag-108m	Ag-108	Cs-126
434.4	3.3E-05	a Fr-223	B-	21.8 M	Rh-108m	Dy-153	Cd-117	Rh-108	Ac-223
					Th-236	Po-200	Hg-189gm	Xe-138	Sn-130
435.05	3.1E-03	a Pa-231	A	3.276E+4 Y	Ir-186	Re-171	Te-134	Re-183m	La-145
					Cs-145				
438.01	4.6E-03	a Pa-231	A	3.276E+4 Y	Te-114	Pm-138m	Tm-149	Ba-140	Es-249
					Pr-151	Eu-139	Rh- 94m	Rh- 94	
438.2	< 0.03	a Rn-219	A	3.96 S	Sn-127	Sm-141	Au-201	Cm-251	La-147
					Am-237				
438.7	1.5E-03	a Pa-231	A	3.276E+4 Y	Zn- 69m	Xe-140	Hg-187gm		
438.8	= 0.04	a Po-215	A	1.781 MS	Cs-117	Pt-184m	Au-193		
439.3	0.081	a Ra-223	A	11.435 D	Ag-101				
439.34	0.012	u Bi-214	B-	19.9 M	Eu-150				
439.6	4.6E-06	a Fr-223	B-	21.8 M	Br- 77	Au-202	Tl-202	Rh-110	Ce-145
					Er-163	Ne- 23	Mg- 23	Mn- 59	Rh-110m
440.44	0.121	t Ac-228	B-	6.15 H	I -123	Pr-131	Ta-169	Th-233	Au-189
					Tb-146m1	Au-190	At-202		
444.5	7.5E-06	a Fr-223	B-	21.8 M	Pa-230	Pd-103	Ru-103	Tb-151	Eu-152
					Ta-162	Rn-206	Ba-148	Ta-171	Yb-164
445.03	1.27	a Ra-223	A	11.435 D	Zr-104	Sb-127	Ho-147	Xe-121	Tl-189m
					Mo- 90				
445.91	3.0E-05	u Pa-234m	B-	1.17 M	Pm-151	Tc-109	Tc-105	In-118m1	La-146m
					Er-172	Rb- 81	Rh-100		
446.6	1.8E-04	u Pa-234	B-	6.70 H	Yb-164	As- 79	Ir-196	Br- 84m	Cd-121m
					Mo-105	Ir-196m	Ce-137		
448.	1.5E-04	a Th-227	A	18.72 D	La-145	Ho-168	Sm-139	Pt-181	Tm-168
					Cf-247	Re-190m	Np-240		
448.4	=1.0E-03	a U -235	A	703.8E+6 Y	Pa-238	Ir-172m	Y - 92	La-129	Pr-151
					Ta-163	Pb-187m			
449.15	0.048	t Ac-228	B-	6.15 H	Lu-163	Ra-230	Nb- 92m	Tc- 94	Xe-120
449.37	1.9E-04	u Ra-226	A	1600 Y	Ac-229	Hg-187gm	Cu- 73	Cs-114	Zn- 63
450.93	3.0E-03	u Pa-234m	B-	1.17 M	Rb- 75	Ag-100	Tm-159	Th-235	Hg-180
450.93	6.3E-06	u Pa-234	B-	6.70 H	Pb-200	Nb- 88m	Ru- 92	Sr- 85m	Rh-106m
					Pr-148m	Nb- 99m	Ag-106m	Kr- 85m	Tl-189
					Rh-104	Ce-132			
452.4	4.3E-05	u Pa-234	B-	6.70 H	Kr- 76	Nd-135	Ag- 98	Ce-147	Te-131
452.47	0.015	t Ac-228	B-	6.15 H	Zn- 79	Ba-130m	Po-199		
452.7	2.7E-05	a Fr-223	B-	21.8 M	Er-155				
452.7	=9.7E-05	a Th-227	A	18.72 D					

Energy 452.9 ～ 477.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
452.92	0.031	u Bi-214	B-	19.9	M	Tm-156				
452.98	0.363	t Bi-212	A	60.55	M	Os-192m	Fm-251	Xe-142	La-130	
453.58	1.9E-03	u Pa-234m	B-	1.17	M	Tl-206m	Eu-139	Gd-140	Ir-172m	Lu-163
						Pa-232	La-131	Pd-101	Y - 99	Xe-125
						Pr-146	Pm-146	Zn- 78	Br- 78	La-143
454.77	0.3	u Bi-214	B-	19.9	M	Lu-178m	Zr- 85	Y - 83	Pd-111m	Br- 72
						Kr- 73				
454.95	2.5E-05	u U -234	A	2.455E+5	Y	Ac-230	Pa-230	Rb- 78m	Rb- 78	Tm-157
455.1	=8.0E-03	a U -235	A	703.8E+6	Y	Sb-130	Tl-199	Xe-137	Tb-150m	Hf-182m
456.7	7.1E-04	u Pa-234m	B-	1.17	M	Nb-103	Cd-103	Pt-191	Ho-153m	Lu-163
						Ir-197gm				
457.17	0.015	t Ac-228	B-	6.15	H	La-129	Os-177	Tl-206m	Pm-137	
457.5	=6.1E-05	a Th-227	A	18.72	D	Pu-233	Sn-111	I -140	W -173	Ba-141
						Pr-138m	Ra-230	Ga- 78	Eu-136gm	
458.68	1.8E-03	u Pa-234	B-	6.70	H	Sm-143	La-129	Yb-161	Rn-210	Po-202
						Tc-107	Lu-165	Hf-183	Ge- 65	Ho-151
						W -172	Th-233	Xe-141	Pm-134	Pm-134m
						Ru-112	Cs-119	Cf-247	Te-129	Tm-166
461.	0.053	u Bi-214	B-	19.9	M	Ho-167	Nb- 96	Tc- 96	Pb-194	Tm-165
						Rh-104	Nd-131	Ru- 97	Lu-163	Tl-188ml
						Te-134	Pr-136	Hg-185gm	Fr-210	Ta-184
461.5	5.4E-05	u Pa-234	B-	6.70	H	Nb-100m	Tm-173	As- 85	Xe-119	Zr- 99
462.	0.221	u Pb-214	B-	26.8	M	In-110	Cs-147	Hg-187gm	Sr-101	Ba-141
						Bi-200	Bi-200ml			
463.	4.4	t Ac-228	B-	6.15	H	Ru-107	Y - 84m	Tc-105	Cs-138	Tb-143
						Zn- 80	Cs-138m	Pa-228	Ba-130m	Pm-139
						Sb-116	In-116ml	Dy-151	Cm-241	In-116
						Tb-141	Bi-192gm	Lu-181		
464.2	4.9E-05	u Pa-234	B-	6.70	H	Rb- 84m	Gd-143	Pm-135	Cs-132	Rn-205
						La-132m	Te-134			
465.2	4.0E-03	a Ra-223	A	11.435	D	Tb-142	Ir-189m2	Re-179	Ga- 79	Tb-149
						Tb-142	Pt-185gm	Ra-220	Pr-133	In-120m2
						Zn- 77	Tc-108	Ru-109	Mo-106	
466.4	0.029	t Ac-228	B-	6.15	H	Ir-189m2	Ar- 32	Ce-147	Re-171	
466.5	4.6E-05	a Th-227	A	18.72	D	Rh-116m	Cs-143	Cs-143	Sr- 76	At-207
468.	3.5E-04	u Pa-234	B-	6.70	H	Cu- 60	Hg-195m	Re-192	Ba-141	As- 81
						Xe-141	Nd-134	Se- 87	Sb-130	Ir-192
						Tl-188ml				
468.44	2.3E-03	u Pa-234m	B-	1.17	M	Rh-102	Th-235	Ge- 75		
469.33	3.1E-05	a Fr-223	B-	21.8	M	Si- 35	Tc-102	Te-137	Zr- 99	Hf-171
						Y - 96				
469.76	0.129	u Bi-214	B-	19.9	M	Ra-230	Ir-197gm	Mo-103	Fr-208	Sn-125
470.25	0.013	t Ac-228	B-	6.15	H	Re-182m	Hg-187gm	Te-121	Ni- 69	Ir-172m
						Er-155	Ge- 66	Cs-130m	I -121	Ra-232
471.76	0.033	t Ac-228	B-	6.15	H	Pm-135m	Co- 66	Tm-163	Dy-153	Bi-196
						Bk-245	Cm-241	Tb-152m	Rn-208	Ti- 43
472.3	5.8E-04	u Pa-234	B-	6.70	H	Ne- 24	Na- 24m	Pa-232	Ra-222	
473.	0.05	t Bi-212	A	60.55	M	C - 18	Ag-115	Cs-118gm	Hg-187gm	Mn- 59
						Rn-208	Am-237			
474.2	5.8E-05	u Pa-234	B-	6.70	H	Kr- 73	Ba-124	Ba-147	Bi-196	Fr-228
						Zn- 77	Fr-228	Sr-101	Sr- 97	Pm-140m
474.41	0.11	u Bi-214	B-	19.9	M	Zr- 83	Tm-150	In-118ml	Pr-149	
474.75	0.022	t Ac-228	B-	6.15	H	Br- 71	Eu-157	Pt-199	Lu-163	Zn- 61
						Ta-175	Rh-102	Rh-102m		
475.4	8.7E-05	a Fr-223	B-	21.8	M	Tc-102m	Pd- 97	Nd-153	Ac-223	I -121
						Cs-134	Zr- 83	Gd-141m	Tb-141	Tb-163
						Nd-139	Dy-144			
475.75	2.3E-03	u Pa-234m	B-	1.17	M	C - 17	Nd-135	Hg-187gm	Ce-131	Hf-181
						Er-150	Pa-238	Dy-151	Nd-133	Hg-187gm
477.6	---	c Be- 7	EC	53.29	D	Nd-136	Pm-144	Sr- 76	Te-112	Hf-183

Energy 478. ～ 500.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Lu-158	Fm-251	Pm-140	Ho-154m	At-206
						Sn-106	Ce-133	Re-179	Nb-104gm	Mo-108
						Be- 7	Pr-147			
478.	0.013	a Pb-211	B-	36.1	M	Re-188	Ir-188	Au-191		
478.33	0.209	t Ac-228	B-	6.15	H	Pt-188	Pu-233			
478.6	2.0E-04	u Pa-234	B-	6.70	H	Ra-232	Ac-229	W -171	Ra-230	Ar- 43
479.6	5.2E-03	a Pb-211	B-	36.1	M	Rh-104	In-132	Ce-137	Pt-181	Te-114
						Tb-151	La-132m	Y - 90m	W -187	Rn-208
480.	4.2E-04	u Tl-210	B-	1.30	M	Re-168	Hg-180	Sr- 97	Hg-185gm	Gd-161
480.	1.9E-05	a Fr-223	B-	21.8	M					
480.	2.8E-04	a Th-227	A	18.72	D					
480.43	0.32	u Pb-214	B-	26.8	M	Tb-141	Bi-200	Fm-251	Ni- 56	La-135
						Pt-187				
480.94	0.023	t Ac-228	B-	6.15	H	Nb- 96	Tc- 96m	Sr- 98	Au-181	
481.	4.9E-04	u Pa-234	B-	6.70	H	Cd-102				
481.1	0.026	a Pb-211	B-	36.1	M	Ir-195m	Hf-170	Hf-183		
481.6	0.021	a Ra-223	A	11.435	D	Np-231	Tb-148m	Tc- 90m		
481.92	0.01	a Pb-211	B-	36.1	M	Lu-184				
482.	1.3E-04	a Th-227	A	18.72	D	Ho-170m	Hf-181	Sn-128	Yb-152	Ge- 81
						Pd-113	Ir-194m2	Ag-119	Ru-113	I -136m
						Hf-166	Ga- 68	Nd-134	Lu-163	Mo-107
						I -138				
485.44	1.9E-05	u Pa-234m	B-	1.17	M	Hg-189gm	S - 39	Th-235	Pr-135	Cd-115m
						At-200gm	Os-192m	Ir-192	Kr- 92	Cs-119
						Np-231	Y - 87	Ge- 79m	Na- 33	Sm-136
						Rn-206				
485.92	0.022	u Bi-214	B-	19.9	M					
485.95	0.018	t Tl-208	B-	3.053	M	Ir-187	Au-184	Re-188		
486.7	<6.0E-03	u Bi-214	B-	19.9	M	Pt-184m	At-203	Ba-131	Pt-187	Ho-147
486.83	2.0E-03	a Pa-231	A	3.276E+4	Y	Rn-208	Y -102	Cs-147		
487.09	0.422	u Pb-214	B-	26.8	M	Ra-227	Dy-168	La-140	Ag-105m	Sr- 99
487.6	0.011	a Ra-223	A	11.435	D	Te-129	Gd-141m	Au-191	At-203	Ag-118
487.95	0.028	u Bi-214	B-	19.9	M	La-128	Pm-136m	Re-170	At-200gm	Ga- 73
						Re-183m	Pm-136	Tb-148m	Ra-219	Pa-238
						Ir-192	Ru-107	Tb-148	Sb-111	
490.33	0.011	t Ac-228	B-	6.15	H	Ca- 47	Sb-115	Ba-126	Ho-152	Tl-198m1
						Y - 83	Au-185	Tc-109	Ce-143	Pb-202m
						Tc-105				
491.	5.3E-04	a Pa-231	A	3.276E+4	Y	Re-190m	Sn-127	As- 81	I -126	Sr- 92
						Se- 81m	Sn-127m	Te-136	Zn- 59	Rn-223
491.82	4.1E-03	a Pb-211	B-	36.1	M	Ta-177	Pu-245	Ir-187	Ir-189m2	Cs-145
492.37	0.024	t Ac-228	B-	6.15	H	Tb-141	Tl-199	Cd-115m	Cd-115	K - 45
						Sm-145	F - 23	Y - 92	Rh- 94	Ho-152m
						Te-131	Ba-145	Ta-171		
493.1	3.7E-05	a Fr-223	B-	21.8	M	Hf-169	Mn- 60m	In-130m1	Ga- 74	Rb- 75
493.1	5.1E-04	a Th-227	A	18.72	D	Cs-118gm	Pm-138m	Ir-184	Pm-135	
493.3	<3.6E-03	t Bi-212	A	60.55	M	Pb-187m	Zr-103			
494.2	1.7E-03	a Pb-211	B-	36.1	M	Pt-199	Pb-196	Te-112	Re-168	Tm-174
494.2	0.012	u Bi-214	B-	19.9	M	Ga- 67	W -172	Tb-141	Y - 83m	Tb-163
						Pm-134	Hf-178m2	Ne- 17	Pr-151	
496.9	6.9E-03	u Bi-214	B-	19.9	M	Zn- 73	Hf-163	Tb-150	Tb-150m	Yb-159
						Ba-131	Gd-149	Pr-133	Ir-197gm	Sb-132m
						Ru-103	Pd-103	Ag-108	Cs-122m2	Cs-122
497.49	5.9E-03	t Ac-228	B-	6.15	H	Tc-102m	Eu-139	Rh-108	Rh-108m	Sb-115
						Kr- 89	Rn-206			
498.	9.9E-05	u Pa-234	B-	6.70	H	Au-200m	Ag-119	Sb-113	Zr-100	Re-171
						Ho-145	Sb-124m1	Se- 84	Ir-183	Dy-155
						Lu-163	Dy-146m	Ho-146	Th-233	
500.4	0.012	a Pb-211	B-	36.1	M	Cs-123	Hg-187gm	Hg-193m	Pd- 96	Po-199m
						Tm-177	Yb-179	Tb-141	Rh-113	Pu-233

Energy 501.4 ～ 524.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life	Relational artificial radionuclide				
					Ag-121	Hf-180m			
501.4	8.5E-04	a Pa-231	A	3.276E+4 Y	Tm-159	Re-178	Tc-103	Pm-148m	Au-186
					Ir-187	Nd-135	Hf-170		
501.96	0.018	u Bi-214	B-	19.9 M	Ta-171	Bi-192gm	Pa-238		
502.	3.6E-03	a Pb-211	B-	36.1 M	Cu- 73	Pb-196	Os-190m	Ir-190m2	Re-190m
502.	4.3E-05	u Pa-234	B-	6.70 H	In-104	Hg-189gm			
503.5	=9.5E-07	u U -234	A	2.455E+5 Y	Nb- 88	Tc- 91m	I -131	La-146m	Ge- 79
					Zr- 83	U -232			
503.82	0.182	t Ac-228	B-	6.15 H	Pu-237				
504.12	5.8E-03	a Pb-211	B-	36.1 M	Pu-233	Zr-100	Ho-148m1	Tl-188m1	Bi-192gm
					Y - 85	Cm-241	Tb-151m	Zr-104	Ho-154m
					Cd-102	Nd-137	La-145	Tl-196m	I -123
					Er-159				
506.75	2.1E-03	u Pa-234	B-	6.70 H	Sn-129m	In-107	Eu-150	I -132	Cs-132
					Ag-120m	Mo-101	Pm-137	Eu-149	Fe- 62
					Ta-171	Np-233	Kr- 91	Hf-182m	Ag-111m
					Ir-198				
507.4	3.3E-05	a Fr-223	B-	21.8 M	Cd-100	Nb- 89	Nb- 89m		
507.4	3.8E-04	a Th-227	A	18.72 D					
507.5	1.6E-03	u Pa-234m	B-	1.17 M	Tb-163	Te-121	Zn- 62	Zr- 97	In-125
508.2	1.5E-05	u U -234	A	2.455E+5 Y	Ni- 65	Am-240	Ta-177	Ac-230	Pa-230
					Tm-150	Sm-139			
508.96	0.45	t Ac-228	B-	6.15 H	Nd-133	Rn-227	Pr-142	Os-192m	
509.2	2.1E-03	u Pa-234m	B-	1.17 M	Pd-111	Ir-197gm	Tb-165		
509.7	1.2E-03	a Pa-231	A	3.276E+4 Y					
510.	0.076	u Rn-222	A	3.8235 D	Se- 73	Tb-150m	Se- 83	Os-182	Ag-108
					I -130	Ce-133			
510.77	8.13	t Tl-208	B-	3.053 M	Rb- 81	Dy-153	I -133	Ta-186	In-105
					Sr-101				
511.	0.032	u Pb-214	B-	26.8 M	Tl-194m	Tb-150	Er-155	Ta-169	Po-206
511.	--	annihi			Tc-112	Zn- 71m	Zn- 71	W -187	Rh-106m
					Ag-106m	Rh-106	Ag-106	K - 45	Sn-104
					Cs-122	Dy-153			
513.4	=1.8E-03	u Pa-234	B-	6.70 H	Er-155	Hg-189gm	Pu-233	Ir-183	Au-182
					Ag-116	Cs-123	Pr-137	Kr- 85	Nb-105
515.06	0.049	t Ac-228	B-	6.15 H	Tc-109	La-146m	Tm-175	Eu-160	At-200gm
					Y - 86	Hf-178m1	Cm-242	Tb-142	Er-149m
					Ba-144	Dy-165m			
516.1	1.0E-03	a Pa-231	A	3.276E+4 Y	Ra-222	Pu-236	Pa-232	La-132	Er-158
					Bi-206	Cs-138m	Ra-227		
516.4	5.0E-05	a Fr-223	B-	21.8 M	Ba-144	At-204	Ga- 79		
516.4	1.7E-04	a Th-227	A	18.72 D					
516.6	1.3E-05	u Pa-234m	B-	1.17 M	Gd-149	Zn- 77	La-147		
517.2	=4.0E-04	a U -235	A	703.8E+6 Y	Au-201	At-208			
517.63	1.5E-05	a Bi-215	B-	7.6 M	Pr-149	Tb-141	Tm-177	V - 55	Tb-154m1
517.63	0.044	a Rn-219	A	3.96 S	Ce-135	Pr-134	Tm-159	Cm-249	Pa-230
					Ir-190				
519.6	6.3E-04	u Pa-234	B-	6.70 H	Eu-141m	Np-241	Pm-157	Xe-117	Mo-103
					Tb-152m				
519.9	0.016	u Bi-214	B-	19.9 M	Rh-114m	Co- 55	Rb- 97		
520.15	0.067	t Ac-228	B-	6.15 H	Tl-202	Au-202	Hf-163	Rb- 83	Cr- 58
					At-205	Pr-154	As- 77	Br- 77	Ho-152m
521.4	1.2E-03	u Pa-234	B-	6.70 H	Sr- 94	Pm-138m	Au-201	As- 81	Ir-196m
					Hg-191	Pb-194	Ag-117m	Os-196	Tc-106
523.13	0.103	t Ac-228	B-	6.15 H	Ta-171	Tl-189	Tb-151m	Po-206	Pr-148m
					Sm-155	Pd-117	I -132	Ac-233	Ga- 80
					Hg-188	Tc-112	Cd-101	Ba-127	Cd-127
524.3	7.0E-05	a Fr-223	B-	21.8 M	Sc- 50	Ho-154m	Mn- 58	Pd- 95m	Tb-145
524.3	1.4E-04	a Th-227	A	18.72 D	Pt-181	Ag-111	Cs-116	Au-180	Pu-233
524.6	0.017	u Bi-214	B-	19.9 M	Nd-133m	Ru- 94	Tm-157		

Energy 526.0 ～ 547.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
526.02	9.2E-06	u Pa-234m	B-	1.17	M	Nb- 99m	Hg-187gm	Pd-111m	Hg-195m	La-131
						Gd-141	Cs-125	Gd-141m	Lu-166m1	Gd-142
						Cd-107	Sb-128	I -128	Xe-135m	Cs-128
527.61	0.07	a Ra-223	A	11.435	D	Au-201	Ho-151	Ir-197gm	Au-185	Cs-143
						At-210	I -139			
527.9	6.3E-04	u Pa-234	B-	6.70	H	Rh- 97m	Cd-115			
528.	4.0E-03	u Bi-214	B-	19.9	M	In-118	Rh- 99m	Rh- 99	Cs-140	Nb-100
529.1	1.5E-04	u Pa-234	B-	6.70	H	Eu-149	Sb-118	Mo- 99	I -123	Sn-132
						Es-252	Cu- 61	Pa-237	Gd-161	Rb- 83
						Br- 83	Ho-166m	I -133	Sr- 96	Y - 97m1
						Sr- 94	Po-201	Ga- 81	Tc-104	Ca- 47
						Tb-141	V - 53	Eu-140	Nd-147	
533.1	2.9E-05	a Fr-223	B-	21.8	M	Cu- 69	Sm-137	Sm-153	Tc-101	Tm-167
						Sr- 99	At-203	Rn-208	Tm-155	Fr-212
						I -121	Tc- 94	Ca- 51	Ho-171	Pb-202m
						Tb-152m	Ba-145	Os-179	C - 17	In-104
						Os-178	Pt-181	Tm-155	Sm-153	
533.66	0.186	u Pb-214	B-	26.8	M	Nb- 88m	Pm-137	Pt-181		
534.1	1.3E-04	u Pa-234	B-	6.70	H	Ag-124	Tl-184	Po-201m	Gd-149	Tb-156
						At-200gm				
535.	9.3E-05	a Th-227	A	18.72	D	Rh-112m	Eu-136gm	Cs-143	Pu-233	Nd-136
						Tc-104	N - 18	Hf-163	Zr-102	
535.8	6.0E-04	a Pa-231	A	3.276E+4	Y	Tb-165	Bi-210m	Y - 85m	Nb-100	Nb-100m
						Bk-243	I -130m	I -130	Y - 99	Cs-130
						Hg-191m	Sr- 99	Cs-130m		
536.77	0.068	u Bi-214	B-	19.9	M	In-123	I -139	Rn-206	Re-184m	Ta-184
537.	7.5E-05	a Fr-223	B-	21.8	M	In-111m	Tb-145			
537.	1.0E-03	a Th-227	A	18.72	D					
537.2	1.3E-04	u Pa-234	B-	6.70	H	Dy-153	Ba-140			
537.45	--	c Pb-206	NN			Bi-206	Po-201m	Rb- 81	Lu-166	Rn-208
538.2	6.5E-03	a Rn-219	A	3.96	S	Ta-171	Np-236m	Pu-240	Xe-132m	Se- 81
						Xe-142				
538.41	0.02	u Pb-214	B-	26.8	M	Rh-116m	Am-244	Nb-103	Sm-141m	I -123
						Re-183m	Cd-105	Rh-113	Ag-124	Tb-165
						Tl-200m	I -130	Po-208		
539.8	8.3E-05	a Fr-223	B-	21.8	M	Ir-197gm	Re-184	Rh-114	Os-177	Kr- 90
						Rh-100	Rh-100m	Ac-233	Ir-184	Pr-136
						Hg-189gm	Ac-229	Nb- 84	Cs-125	Eu-142m
						Po-201m	Xe-141	Tb-154m1	I -116	
540.76	0.026	t Ac-228	B-	6.15	H	Hf-171	La-132	Ac-226	Nd-149	Hf-170
						I -134	Ho-170m	In-106	Nd-138	Ba-144
						La-144	Mo- 93m	Rh-112	Tm-159	Ga- 73
						Sn-123m				
543.	0.084	u Bi-214	B-	19.9	M	Au-181	Ir-197gm	Ge- 79m	Eu-145	Au-201
						Rh- 99m	Sb-116m	Pt-199	Nb-100m	I -114m
						Te-136	Ho-145	Rh- 95m	Sb-127	
543.8	2.1E-04	u Pa-234	B-	6.70	H	Tc- 90m	Sm-135	Sn-130m		
543.81	0.069	u Pb-214	B-	26.8	M					
543.98	3.6E-03	u Pa-234m	B-	1.17	M	Ag-119	Tl-190m	Ba-145	Es-254m	Ba-130m
						Eu-138				
545.4	4.6E-06	a Fr-223	B-	21.8	M	Sb-129	Sb-109	Pt-189	I -118	At-209
						Rh-101m	Te-114	As- 78	Cs-148	Bi-200
546.	--	a Pb-211	B-	36.1	M	Nd-152	W -172	Ir-189m2	Po-199	Dy-165
						Zr- 99				
546.47	0.201	t Ac-228	B-	6.15	H	Rh-110m	Au-187	Dy-151	Ra-213m	Ba-129m
						Gd-140	Bi-198m1	I -135		
546.7	8.7E-04	a Pa-231	A	3.276E+4	Y	Pm-154m	I -140	Tc- 90m	Np-233	Pd-111
						Rn-223	Cs-145			
547.6	<4.0E-03	u Bi-214	B-	19.9	M	Tm-164m	Tb-147	Pa-238	Yb-153	Pb-202m
						Ca- 51	Yb-180	Ce-131	Os-178	

Energy 548.7 ～ 572.1 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
548.73	0.023	t Ac-228	B-	6.15	H	Kr- 92	Pt-184	Zn- 62	Tb-164	Tc- 91
						Rb- 81m	Cs-129	Ar- 45	Zr-102	Er-157
549.73	0.114	t Rn-220	A	55.6	S	Sn-132	Nb- 97	Cm-249	Hf-173	Fr-228
						W -189	Pm-148m	Pm-148	Eu-148	Ir-189m2
						La-130	Bk-248m			
551.8	5.5E-07	u Th-230	A	7.538E+4	Y	Ho-150m	Y - 94	Te-116	At-209	Sm-158
						W -187	Nb-102m	Er-159	I -118	Os-178
551.9	--	u Bi-214	B-	19.9	M	As- 79	Lu-164			
552.4	4.6E-05	a Fr-223	B-	21.8	M	Pr-136	In-106	Se- 81	Sn-123m	Rb- 83
552.4	2.8E-04	a Th-227	A	18.72	D	Br- 83	Au-201	In-117	Sb-117	Er-151
553.7	7.1E-05	u Pa-234	B-	6.70	H	Fr-208	Eu-148	Ge- 69	Sr- 80	Ho-153m
						Ba-129	Gd-143	Tl-184	Tb-141	Br- 82
						Kr- 90				
555.12	0.046	t Ac-228	B-	6.15	H	Sn-134	Cm-244	Np-240m	Pr-147	Tb-147
						Pa-237	Cs-141	Fr-227	Nb-104gm	Cd-126
						Y - 91m	Ag-104m	Ag-104		
556.5	2.2E-05	a Fr-223	B-	21.8	M	Rh-104m	Rh-104	Cs-118gm	Au-185	Pr-134
556.5	2.1E-04	a Th-227	A	18.72	D	Pr-134m	Rb- 86m	Pd-115	Rh-102	Eu-142m
						Ag-102m	Ag-102	Au-183	Xe-141	
557.24	8.6E-06	u Pa-234m	B-	1.17	M	Zr- 84	Tl-190	Tl-190m	Ru-103	Xe-140
557.3	7.1E-04	u Pa-234m	B-	1.17	M	Sn-128	Os-193	Gd-141m	Lu-173	Tb-154
558.	1.5E-04	u Pa-234	B-	6.70	H	Ce-133m	Cs-146	Rh-114m	Pb-197m	Re-190m
						Ir-190	Ge- 77	Tb-144m	Pd- 94	Re-168
558.46	--	c Cd-113	NG			Rh-111	Tm-159	Eu-149	Tl-195	In-114
558.46	--	c Cd-114	NN			In-114ml	Ag-114	Gd-140	Re-190m	Pu-233
559.2	1.2E-04	u Pa-234	B-	6.70	H	Hg-185gm	Br- 76m	Cd-104	Sm-137	Fr-206
						Br- 76	As- 76	Os-193	Pm-134	Dy-149m
						Au-187	Cs-122m2	Pu-245	Cs-116	Hg-195m
						I -120m	I -120	Rn-208	Cm-249	As- 82m
						Gd-141m	Pb-191m	Zn- 77	Pm-135	
562.5	0.87	t Ac-228	B-	6.15	H	Nb- 92m	Am-238	Cm-242	Y - 92	Nb- 92
						Ar- 43	Cs-141	Nb- 95	Rb- 78	Rb- 83
						Ir-194m2	Bi-198ml	Lu-163	Cm-251	
562.8	5.8E-05	u Pa-234	B-	6.70	H	Ti- 43				
562.93	--	c Ge- 76	NN			Tc-103	Ga- 76	Eu-152ml	Br- 76	Pu-236
						Cs-134	La-134	Ho-145		
563.7	1.0E-05	a Bi-215	B-	7.6	M	Os-192m	Re-189	Tl-191m	Tl-195	V - 53
563.7	<3.2E-03	a Rn-219	A	3.96	S	Ir-189m2	Eu-142m	Sr- 98	I -122	Pm-135
						Sb-122	Sn-111	Cd-117m	I -140	
565.2	1.6E-03	u Pa-234	B-	6.70	H	Pm-132	K - 47	At-200gm	Rn-223	La-133
						Hg-189gm	Au-183	Dy-165	Ho-153m	V - 55
						Pd-101	Te-134	Se- 88	Pb-190	Se- 81
						Zn- 80	Lu-163	Tb-150m		
568.9	5.8E-03	u Pa-234	B-	6.70	H	Ga- 78	La-132m	La-132	Cs-132	Rh-107
						Cd-100	Ag- 99	Pm-149	Te-115	Re-171
						Pt-189	Nb- 96	Tc- 96	Rb- 81	
569.	7.0E-04	a Fr-223	B-	21.8	M	Ce-131m	Ho-154	Tb-150	Ac-229	
569.	5.6E-04	a Th-227	A	18.72	D					
569.5	0.013	u Pa-234	B-	6.70	H	Bi-202	Ru- 97	Re-190m	Re-190	Ir-190
						Os-192m	Ag-122	Pt-186		
569.7	1.6E-03	a Tl-207	B-	4.77	M	Dy-167	Pb-207m	Bi-207	At-202	Yb-161
569.7	--	c Pb-207	NN			Rb- 92	Mn- 57	Ho-154	Po-212m	Co- 57
569.7	1.5E-03	a Po-211	A	0.516	S					
570.5	3.3E-06	u Th-230	A	7.538E+4	Y	Ba-144	Ho-154m	Bi-205	Mn- 59	Cs-143
						Po-208				
570.91	0.182	t Ac-228	B-	6.15	H	Tm-162	Au-196	Lu-166ml	Eu-157	Rn-210
						Ga- 80	Ag- 98	I -139	Xe-142	Pm-157
571.8	5.3E-04	a Pa-231	A	3.276E+4	Y					
572.	8.7E-04	u Pa-234m	B-	1.17	M	Eu-148				
572.14	0.15	t Ac-228	B-	6.15	H	Tb-145	Lu-170	Se- 75	Ce-135	Zn- 60

Energy 572.7 ～ 596.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
572.76	0.074	u Bi-214	B-	19.9	M	Bi-197	Rh-110	Mo- 93m	Hf-170	U -242
						Sm-135	W -168	Te-121	Se- 87	Hg-193m
573.88	--	c Pb-204	NG			Y - 82	Sb-126	Zn- 69m	Ge- 69	Hf-178m2
						Ni- 69	Sr- 81			
575.5	4.3E-05	u Pa-234	B-	6.70	H	Nd-136	Lu-181	U -230	Gd-141m	Pd-111m
						Gd-163	Fr-206	Ir-195m	Gd-140	Y - 99
575.7	1.7E-05	a Fr-223	B-	21.8	M	Eu-136gm	In-114			
575.7	1.2E-04	a Th-227	A	18.72	D					
576.	--	t Bi-212	A	60.55	M	Se- 73	Gd-146	Ag-114	Yb-162	Os-177
						Kr- 72	La-124gm	Ir-187	Nd-152	Kr- 89
						Ce-135	Lu-160gm			
578.5	1.2E-04	a Th-227	A	18.72	D	Ce-131m	Nd-133m	As- 84	Se- 73m	Cu- 68
						Ce-147	I -116	Pr-147	Tl-197	Ba-127
						Dy-145m	Ga- 68	Bi-202	Hg-191m	Te-136
579.14	--	u Bi-214	B-	19.9	M	Rb- 95	Br- 77	Ag-105m	Tl-200	Au-200m
						Ru-107	Y -102			
580.13	0.352	u Pb-214	B-	26.8	M	Bi-205	Pd-111m	Pd-111	Pm-139	
580.4	--	a Ra-223	A	11.435	D	Ce-147	Rn-208	Kr- 85m	Nd-137	Sr- 85m
581.19	8.1E-05	u Pa-234m	B-	1.17	M	Gd-159	Pm-137	Er-159	Rh-108	
581.3	2.1E-05	a Fr-223	B-	21.8	M	Pr-154	Pa-232			
581.7	1.2E-05	u U -234	A	2.455E+5	Y					
581.9	--	u Bi-214	B-	19.9	M	Pb-194	Fr-230	In-110	Mg- 22	Fe- 63
						Tc- 95m	I -140	Ir-172m	Pm-144	
583.	4.4E-03	a Pa-231	A	3.276E+4	Y	Cd-100	Au-192	Pm-135	Pm-135m	Au-183
583.19	30.36	t Tl-208	B-	3.053	M	Y - 98m	Ba-144			
583.19	--	c Pb-208	NN							
583.41	0.111	t Ac-228	B-	6.15	H	Lu-168	Pa-238			
584.1	2.8E-04	u Pa-234	B-	6.70	H	Ag-113m	Ce-131	Eu-136gm	Tb-163	Yb-162
						Eu-150	Es-254m	Ir-186	Nb- 86	Pb-201
						Rh-110m	Pt-185gm	Cd-119m	U -242	La-144
						Al- 25	Hg-195			
586.3	1.2E-04	u Pa-234	B-	6.70	H	Rb- 97	Br- 77	Re-183m	Cd-126	Tb-141
						Tb-164	Tm-156	K - 47	Kr- 89	I -130
						Cs-130	Ga- 80	Os-196	Eu-152	Eu-152m1
						Au-191	Cs-118gm	Yb-153	K - 42	
587.7	0.014	t Tl-208	B-	3.053	M	Br- 92	Cs-127	Ce-143	Tl-198m1	At-204m
						Ge- 65	Zr- 89m	La-135		
588.1	1.0E-05	a Fr-223	B-	21.8	M	Nb- 89	Nb- 89m	Ag-101	Gd-143m	Tl-201m
						Rh-100	At-204	At-207		
589.	5.6E-05	a Th-227	A	18.72	D	Cs-129	Ir-192	Cu- 61	Ta-185	Cs-141
						Tl-196m	I -138	As- 67	Sr- 80	Ho-147
						Ir-194	Sn-125m			
590.3	5.8E-05	u Pa-234	B-	6.70	H	Pm-146	Gd-141m	Lu-181	Es-252	Mo-101
						Y - 93m				
590.4	0.017	t Ac-228	B-	6.15	H	Sr-101	Xe-120	Pd-101	Cs-118gm	Tc-100
						Mo-101	Pt-181	Mn- 59	Ag-123	Ho-150
592.3	4.1E-05	a Fr-223	B-	21.8	M	Ho-149m	Eu-154	Rn-223	Ra-219	Os-185
						Au-184	Tl-188m1	Bk-248m	Nd-152	Tl-195
						Er-161	Eu-136gm	Pm-148	In-102	Sb-126
						Tc- 95	Te-127m	Po-201	K - 43	Sc- 43
						Kr- 94	Nd-135	Dy-153		
595.23	0.017	u Bi-214	B-	19.9	M	Os-179	Au-183	Zr- 99	La-131	Rh-111
						Tm-150	Tm-166	I -121	Os-178	Pm-134m
						Cu- 69	Ce-131m	Ta-169	B - 13	Y - 80
595.4	1.5E-04	u Pa-234	B-	6.70	H	I -134	Mo-106	Tc-107		
595.85	--	c Ge- 73	NG			As- 74	Ga- 74			
595.85	--	c Ge- 74	NN							
596.	1.4E-05	a Fr-223	B-	21.8	M	La-133	Cs-147	Zn- 71m	Pr-151	Sm-139
596.	9.7E-06	a Th-227	A	18.72	D	Sr- 96				
596.9	3.1E-04	u Pa-234	B-	6.70	H	Zn- 62	Cs-123	Au-183	Cm-244	Cd-107

Energy 598.5 ～ 620. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Np-240m	Dy-157	Tl-186ml	Rn-227	Au-190
598.5	--	u Bi-214	B-	19.9	M	Rh- 98	Eu-141	Pb-190	Ce-131	
598.72	0.093	a Ra-223	A	11.435	D	Cu- 76gm	I -121	Tm-166	Rh- 98m	Pd- 96
						Mo-103	Dy-167	Fr-230		
600.	8.0E-03	u Bi-214	B-	19.9	M	Eu-156	Bi-192gm	Zr-102	Gd-141m	Hg-195
						I -132m	Po-205	Yb-161	Zr- 84	Nb- 87
						Hg-189gm	Te-114	Xe-132m	Mn- 52	Sr- 98
						Tb-144m				
600.66	4.9E-04	u Ra-226	A	1600	Y	Rb- 97	Nb-100m	La-128	Ir-194m2	Np-240
						I -118	I -118m	Os-178		
600.7	8.3E-06	a Fr-223	B-	21.8	M	Ga- 72	I -137	I -120m	I -120	Po-199m
						I -139				
602.6	8.6E-04	u Pa-234	B-	6.70	H	Pr-146	La-148	Pb-202m	Te-131	Y - 82
						Cs-140	Zr- 97	Y - 99	Pd-109	Pm-136
						Pm-136m	Sb-124ml	I -124	Sb-124	Rb- 91
						Po-208	Hf-182m	Te-115	Sb-127	Te-135
604.6	8.2E-05	u Pa-234	B-	6.70	H	Ge- 79	Mn- 51	Tc- 95	Pr-149	In-105
						Cs-134	La-134	Tb-151	Ta-164	Cm-242
						Re-190	Re-190m	Ir-190	Ac-229	Cs-141
						Pb-200	Nd-154	Xe-142	Rb- 98m	I -118
						Eu-141	Eu-141m	Os-192m		
607.5	4.6E-05	a Fr-223	B-	21.8	M	Kr- 79	Eu-158	In-112	Zn- 75	Kr- 77
607.5	1.7E-04	a Th-227	A	18.72	D	Hf-177m2	Au-183	Tc- 91m	Ag-112	Tm-155
						Sb-125	Ce-135	Mg- 28	Ga- 79	Au-186
						Tl-186ml	Pt-189	Pb-195m	Yb-162	
608.3	4.3E-03	a Rn-219	A	3.96	S	Bi-204m2	Xe-140	Xe-135	Mo-103	Hf-164
						Tb-163	Tl-184			
608.35	--	c Ge- 74	NN			Ga- 74	As- 74	Tc-105	Ti- 51	Rb- 77
						Eu-140				
609.	7.3E-03	a Pa-231	A	3.276E+4	Y	Br- 75	Rh-113	Ag-105m	La-128	In-103
609.31	46.1	u Bi-214	B-	19.9	M	Nd-155	Rn-218			
609.32	0.056	a Ra-223	A	11.435	D					
609.38	0.043	a Pb-211	B-	36.1	M	Ni- 65	Er-148	In-120m2	I -132m	
610.64	0.023	t Ac-228	B-	6.15	H	Er-172	Pt-184m	Ru-103	Pm-132	Au-181
						Pt-184	Tl-196m	Tl-196	Te-115m	Hg-191m
						Ir-187	Tb-164	Ti- 42	Cs-123	At-200gm
						Pm-148	Eu-148	Cs-116		
612.	6.1E-04	u Pa-234	B-	6.70	H	Pt-186	W -177	As- 68	Zr- 86	Ag- 98
						Ru-103	Yb-179	Ir-192ml	Ir-192	Au-192
613.6	2.9E-05	a Fr-223	B-	21.8	M	Xe-139	Kr- 91	B - 14	Tc-110	Ho-152
						Fr-228	Ag-124	Au-201	I -128	Cs-128
						In-109	Br- 78	As- 78	Pr-135	Au-182
						Ho-152	I -132m	Ir-189m2	Y - 99	Tm-158
						Ge- 77m	I -118m	Er-163	At-206	Gd-142
						Rh-108				
615.73	0.06	u Bi-214	B-	19.9	M	I -120m	Au-181	Sb-122	Pr-148	Cs-116
						Hf-181	Rh- 98m	Ta-186	As- 71	Tl-190
						Tc- 96m				
616.22	0.08	t Ac-228	B-	6.15	H	Rh-106m	Ag-106m	Ag-106	Lu-160gm	Rh-106
						Tc- 95m	Nb- 87	Os-190m	Ir-190m2	Tb-151
617.	0.034	u Bi-214	B-	19.9	M	Y -100	Rb- 80	Tl-184	Yb-162	U -230
617.	8.2E-05	u Pa-234	B-	6.70	H	Y - 96m	In-112	Pb-187m	Cm-242	
617.52	--	c Cd-112	NN			Ag-112	Tb-141	Ac-226	Am-238	K - 43
						Ir-183	Po-200	Rh- 99m	Pr-144m	At-205
						In-125	I -133	Pm-144	Rh- 99	La-133
619.	5.8E-05	u Pa-234	B-	6.70	H	W -187	Cs-114	Xe-142	Fe- 61	Te-127
						Dy-146	Mo-106	Hg-205	Hf-181	Ge- 65
						In-123	Ag-108	Rh-108m	Br- 82m	Br- 82
						C - 17	Tc-110	Ar- 45	Eu-157	Os-192m
620.	--	t Bi-212	A	60.55	M	Yb-162	Gd-142	Sb-126ml	Sr- 91	Ag-111m

Energy 620. ～ 641. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
620.	8.0E-07	u Th-230	A	7.538E+4	Y	Nb- 86	Ba-131			
620.38	0.08	t Ac-228	B-	6.15	H	Zn- 71m	Nb-104gm	Rn-205	Dy-148	Ag-111
						Rn-208	Y - 98m	Zr- 86	Np-242m	Dy-165
						Mo-103	Au-187			
621.4	5.6E-05	a Th-227	A	18.72	D	Pr-135	Lu-163	La-143	Rn-223	La-133
						Sr- 94	Nd-139	Mo- 99	I -134	Al- 31
						Cm-249	Rh-106	Ag-106	Ir-194	Ag-111
						Pm-141	Ho-145	Rb- 79	In-104	Pb-204m
623.27	0.011	t Ac-228	B-	6.15	H	Nb-100	Rh- 95	Pt-187	Tb-162	Pr-149
623.4	8.2E-03	a Ra-223	A	11.435	D	W -173	Na- 31	In-109		
623.8	7.0E-06	a Fr-223	B-	21.8	M	Pa-238	Ir-189m2			
623.8	1.5E-04	a Th-227	A	18.72	D					
624.2	5.6E-04	u Pa-234	B-	6.70	H	Ho-150m	Pt-191			
624.4	=8.2E-07	u U -234	A	2.455E+5	Y	Ir-178				
624.6	1.4E-04	u Pa-234m	B-	1.17	M	Er-159	I -123	Pr-144	Cd- 98	Se- 69
						Tl-190m	Tl-190			
626.4	=5.0E-03	u Bi-214	B-	19.9	M	Rh-114m	W -187	Cd-104	Pd-117	Bi-197
						Es-250m	Cd-103	Zn- 77	Ag-119	Ge- 80
						Rb- 77				
627.23	0.014	t Ac-228	B-	6.15	H	Ru- 95	Cd-103	Tc-101	Pt-189	Ga- 63
						Y - 86m	Cs-139			
628.1	3.8E-04	u Pa-234	B-	6.70	H	Tc-102	Ta-163	Y - 86	Tb-140	Zn- 75
						Rh-102	Rh-102m	Tc-102m	Ag-119	Lu-174m
						Mn- 61	Te-127m	Fr-206	Sb-128	Te-116
629.4	0.045	t Ac-228	B-	6.15	H	At-205	Ho-169	Am-246	Os-196	Bi-201
629.4	5.6E-04	u Pa-234	B-	6.70	H	Kr- 94	Au-181	Rh-104	Pt-183m	Pt-187
629.95	--	c Ge- 72	NN			Po-207	As- 72	Ga- 72	Pm-148m	Eu-148
						Pu-245	Kr- 91	I -132	Cs-132	Tc-102m
						Re-186				
630.79	< 0.018	u Bi-214	B-	19.9	M	Dy-149m	Dy-168	Er-149m	W -172	Te-136
						Re-190	Rb- 98m	U -239	Pm-134	Au-189
						Ce-137				
632.	0.03	a Ra-223	A	11.435	D	Y - 96m	Yb-161	Rn-207	Ho-168	I -119
						Rh- 96	Nb- 99m	Cd-117m	Ge- 77	Tb-148m
						Ag-103	Tb-148	Y - 97m2	Rn-206	
632.3	2.9E-05	a Fr-223	B-	21.8	M					
632.3	1.3E-04	a Th-227	A	18.72	D					
632.6	5.8E-05	u Pa-234	B-	6.70	H	Ba-133m	In-106	In-106m	La-133	Pd-111m
633.14	0.055	u Bi-214	B-	19.9	M	In-108m	In-108	La-145	Gd-163	Ag-108
						As- 67	Ir-188	Eu-146	Cs-148	Pm-146
634.18	0.011	t Ac-228	B-	6.15	H	Si- 35	Ge- 79m	La-135	Eu-146	Lu-163
634.3	2.1E-04	u Pa-234	B-	6.70	H	Br- 74m	Mo-106	Pb-203m2	Cm-249	B - 14
634.72	6.5E-03	u Bi-214	B-	19.9	M	As- 74	Br- 74m	Br- 74	Tl-192gm	
634.9	1.4E-05	u U -234	A	2.455E+5	Y	Ir-188	As- 74	Re-188	Au-187	Bi-210m
						Tl-196	Rn-223	Tl-196m	Cd-105	In-118m1
						Sb-132	I -114m	Pt-186	Pr-138m	Mo-108
						I -119	Sb-125	Kr- 73	Lu-173	Sb-128
						Tl-194	Tl-194m	Fr-208	Ir-186	Ti- 42
						Sb-110	Tc-102	Zr- 85	Er-174	Tl-198m1
						Cm-241				
639.67	0.03	u Bi-214	B-	19.9	M	Te-116	Hg-190	Nb- 88m	Sn-113	Tb-150m
						Yb-164	Hf-177m2	Er-151	Tl-191m	Cs-122m2
						In-127	Ac-234	Ir-178	I -117	Xe-117
						Re-181	Nd-133m	Cs-116	Br- 80	Rh-116m
						Tb-148	Rb- 80	Pr-134m	Pm-140	Dy-145m
						Ag-100				
640.34	0.054	t Ac-228	B-	6.15	H	Ag-116	Cs-146	Tc-105	Tl-191m	
641.	1.8E-05	a Th-227	A	18.72	D	Po-203m	Nb-103	I -120	Sr- 77	La-142
						Pr-147	Nd-131	Er-151	At-203	In-110
						Pr-142	Ta-164			

Energy 643.2 ～ 669.6 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
643.2	4.3E-05	u Pa-234	B-	6.70	H	Zn- 80	Sb-131	Pa-236	Np-236m	Pu-240
						Er-174	I -131	Ru- 93m	Sn-125m	Yb-179
						Rn-227	Cl- 40	Rb- 81m	Sb-111	La-128
644.2	4.6E-05	a Th-227	A	18.72	D	Pd-113	Po-202	La-143	Fr-210	Te-119
						Ir-180	Rh- 96	Cs-123	Y - 96	Lu-163
						Rb- 97	Sn-104	Te-113	Xe-142	La-145
645.5	5.4E-03	t Ra-224	A	3.66	D	Nb- 98m	Th-235	Au-201	Pu-236	Nb- 98
						Au-194	Sn-129	Pr-133	Tl-194	Ru- 97
						Ho-160	Pb-187m	Au-181	Pm-133	Sb-124m1
						Sb-124	Y - 86			
646.5	1.8E-04	u Pa-234	B-	6.70	H	In-127	Os-185	P - 37	Eu-156	Ho-160
						Th-236	Cs-141	Sn-113	I -133m	
647.7	1.6E-03	u Pa-234m	B-	1.17	M	I -139	Ho-152	Pd-109	Gd-141m	Tb-164
						Ho-152m	Tb-152m	V - 52	Mn- 52	Te-133m
						Br- 71	Sb-130m	Rh-114m	Bi-200	Rb- 77
648.5	1.8E-05	a Th-227	A	18.72	D	Ba-141	At-207	Tb-150m	Cd-105	
648.84	0.04	t Ac-228	B-	6.15	H	Au-184	Rn-210	Rn-223	Eu-138	Es-254m
649.	1.0E-03	u Pa-234m	B-	1.17	M	Br- 83	Rb- 83	Pb-198		
649.18	0.06	u Bi-214	B-	19.9	M	Ag-115	Er-159	Ag-105m	Os-177	
649.5	4.9E-08	u Hg-206	B-	8.15	M	Cu- 69	Tb-154m1	Tb-154m2	Ge- 65	Xe-121
						Se- 81				
650.1	0.013	t Tl-208	B-	3.053	M	In-109	Sn-109	Pd-117	Zr- 99	Au-181
						In-109m1	Bi-208m	Ag-122	Tl-194m	Tb-150
						Tb-150m	Ta-164			
651.26	--	c Cd-113	NG			Ag-105	Sr- 92	Te-127m	Tb-149m	As- 68
						K - 44				
651.5	<2.0E-03	u Bi-214	B-	19.9	M	Ta-166				
651.51	0.09	t Ac-228	B-	6.15	H	Rh-116m	Tb-149	Sr- 97	Sr- 91	Sn-132
						Lu-181	Tc- 98	Ba-130m	Rh- 98	Rh- 98m
653.7	7.4E-04	u Pa-234	B-	6.70	H	Cm-249	Sr- 91	Mo- 91m	Eu-138	Gd-141m
						Cd-126	Pd- 99	Ho-150m	Rh-110m	Xe-140
						Fr-230	Eu-145	Dy-149	Yb-179	Zn- 79
						Cs-122m2	Rb- 75	Sb-128	Te-131	Sb-129
						As- 82	Ag-119	Xe-135		
655.2	2.1E-04	u Pa-234	B-	6.70	H	Nb-102m	Nd-149	Au-204	Br- 90	
655.3	1.4E-03	u Pa-234m	B-	1.17	M	Sm-139	Am-237	Ir-183	Sm-139	Tb-146m1
						I -139	Cu- 61	Ag-119	Pm-152m1	Nb- 99m
657.4	6.3E-04	u Pa-234	B-	6.70	H	At-203	Tm-158	Lu-162	Te-115	Br- 76
						Xe-142	In-121	Pb-202m	Bi-202	Ag-110
657.76	--	c Cd-110	NN			Pr-145	In-110m	In-110	Ag-110m	Rb- 89
						Ru-113	Sb-131	Nb- 97	In-104	
658.7	0.015	u Bi-214	B-	19.9	M	Au-181	At-207	Mo- 89	Te-127m	Yb-161
659.8	4.3E-04	u Pa-234	B-	6.70	H	Ne- 18	Eu-139	Ag-118m	At-205	
660.1	=5.0E-03	t Ac-228	B-	6.15	H	At-208	Cs-143	Rb- 95	Ag- 98	Ag-119
661.1	0.047	u Bi-214	B-	19.9	M	Xe-117	Ho-148m1	Tl-200	Au-200	Mn- 50m
						Cs-137	Ba-137m	Au-181	Re-181	La-141
663.1	2.1E-05	a Fr-223	B-	21.8	M	Cs-143	Pd- 98	Hf-171	U -239	Pr-149
663.1	5.6E-05	a Th-227	A	18.72	D	Pr-151	La-132	La-132m	Fr-230	
663.82	0.028	t Ac-228	B-	6.15	H					
663.9	8.6E-04	u Pa-234	B-	6.70	H	Pb-204m	Dy-155	Rb- 78m	Sb-109	Ce-143
665.45	1.46	u Bi-214	B-	19.9	M	Eu-159	Dy-146	Ta-170	Ac-232	Te-131m
						As- 76	Eu-146	Bi-196	Mg- 31	Ar- 34
						Ag-100m	Br- 80			
666.45	0.062	t Ac-228	B-	6.15	H	Y -100	Os-181m	At-200gm	La-146	Sb-126m1
						Au-181	Tm-163	As- 80	Zn- 74	Sb-126
						I -126				
666.5	1.9E-03	u Pa-234	B-	6.70	H	Sr-101	Zr- 84	Zn- 71	Ag-116m	Ge- 64
						Er-151	Au-182	Ag-101	Lu-171	Y - 97m1
						I -132	I -132m	Cs-132	Rh-112m	Cs-119
669.62	--	c Cu- 63	NN			Gd-143m	In-105	I -140	Sb-114	As- 70

Energy 669.7 ～ 695.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						I -130	Y - 97m2	Nd-139	Sn-108	At-205
						Zn- 63				
669.7	1.6E-03	u Pa-234	B-	6.70	H	I -132				
670.	4.2E-04	u Tl-210	B-	1.30	M	Th-233	Sb-112	Nb- 86	Rh-107	Cm-241
670.8	3.7E-04	u Pa-234m	B-	1.17	M	Bi-204	Au-181	Po-200	Lu-165	Nb- 88
671.9	1.2E-05	a Fr-223	B-	21.8	M	Cl- 38m	I -132	Sb-125	Rb- 75	Cd- 99
						Bi-194	Te-129m	Th-226		
672.	0.026	t Ac-228	B-	6.15	H	Tm-166	Ag-113	Tm-162	Tm-162m	Tm-162
						La-124gm	Tm-152	Tm-152m	Rn-209	At-205
673.9	6.4E-04	u Pa-234m	B-	1.17	M	Re-190m	Pd- 99	In-109m2	Tb-164	Dy-146m
						W -172	Na- 31	Kr- 87	Se- 83m	Ho-166
674.16	< 0.109	t Ac-228	B-	6.15	H	In-105m	Yb-153	Rn-211	Au-191	Tl-197
						Cu- 73				
674.75	< 0.109	t Ac-228	B-	6.15	H	Nb- 99m	Po-199m	Tm-166	Ga- 78	
675.1	1.6E-04	u Pa-234	B-	6.70	H	Pr-144	Rn-205	At-207	K - 48	Ca- 52
						At-202	Yb-164	Cd-102	Pr-145	Tl-198
676.64	4.8E-06	a Bi-215	B-	7.6	M	Au-198	Ru-105	C - 17	Ho-169	Au-186
676.64	0.021	a Rn-219	A	3.96	S	Tb-154m1	Eu-159			
676.69	0.013	a Pb-211	B-	36.1	M	S - 40				
677.11	0.062	t Ac-228	B-	6.15	H	Br- 80	Br- 80	Ag-118	Ag-118m	S - 30
677.41	6.0E-03	u Bi-214	B-	19.9	M	I -134	Fr-230	Au-180		
677.6	=1.0E-06	u U -234	A	2.455E+5	Y	Eu-147	Rh- 95	In-110	Pr-134m	Ag-110m
						Ag-101	Br- 92	Th-236	Mn- 60m	In-107m
						Ag- 98	Au-181	Sn-107	Sb-109	Eu-152
						Rh-114m	Xe-120	I -116	Sm-142	Am-246
682.3	7.5E-06	a Fr-223	B-	21.8	M	Pd- 95m	Y - 84m	Sn-128	Pb-203	Ag-113
						Rb- 95	Ru- 93	Sb-130	Br- 83	Rb- 83
						Y - 90m	Ba-126	Eu-159	Y - 83	Eu-142
						I -114	I -114m	Ga- 68		
683.22	0.081	u Bi-214	B-	19.9	M	Cr- 58	Dy-146m	Ho-146	La-148	In-118m1
683.4	5.7E-04	u Pa-234m	B-	1.17	M	Tl-190	Tl-190m	Ho-152m	Sb-129	
683.9	2.5E-04	u Pa-234	B-	6.70	H	I -122				
684.	0.019	t Ac-228	B-	6.15	H	I -117	Fr-206	Zn- 79	At-204	Ho-156
685.1	2.3E-04	u Pa-234	B-	6.70	H	Ag-117m	Sm-141m	Mo- 93m	Os-179	Ir-195m
						Rh- 96m	Rh- 96	As- 67	Pr-151	Zn- 80
						Eu-138	Sb-127	W -187	Nd-147	I -130
						Bi-210m	Am-246	Nd-137	Tb-143	Ag- 97
687.6	6.9E-03	u Bi-214	B-	19.9	M	Tl-206m	At-208	Lu-165	Pa-238	Rh-100m
						At-211	Ag-110m	Rb- 97	Cs-148	Yb-163
						Br- 80	Pa-236	Po-207	Pu-240	Mo-103
						Rh-110m	Cs-132	Ir-194m2		
688.1	0.067	t Ac-228	B-	6.15	H	Mg- 30	Cd-127	Rb- 79	Pu-233	Pr-138
						Hf-163	Pm-152	Tb-164	Ho-153	Ac-234
						Eu-152	Es-254m	Eu-152m1	Au-181	Au-196
						Sm-143m1	Mo- 93m	Ag-123	Dy-151	Pt-186
						Lu-171	Bi-196	Bi-196m2	Tc-100	Te-115m
691.	7.8E-03	u Pa-234m	B-	1.17	M	Au-203	Zn- 61	Y - 80	Ag-113m	Tl-192gm
						As- 72	Ho-156	Ba-130m	Pu-236	
691.43	--	c Ge- 72	NN			Tm-166	Mo-103			
692.	3.8E-05	a Th-227	A	18.72	D	Au-204	Se- 69	Dy-148	Mn- 57	Rb- 96
						Tl-190m				
692.5	5.6E-03	t Ac-228	B-	6.15	H	Pb-201	Co- 57	Tb-154m1	Tb-154	Eu-154
692.6	2.0E-03	u Pa-234	B-	6.70	H	Sb-122	Ag-112	I -122	Rb- 78	Rb- 78m
693.3	6.0E-03	u Bi-214	B-	19.9	M	Xe-119	Au-185	Zn- 73	As- 67	Ac-234
						La-123	Tb-142	Es-254m	Eu-139	Nb-104gm
694.6	7.5E-06	a Fr-223	B-	21.8	M	Pm-144	Ho-151	Es-252	Co- 67	Pd-111m
						Rh-114	Rh-114m	Tb-147	K - 42	La-124gm
						Br- 78	Nb- 99m	Ag-112	Sb-126m1	Po-200
						In-112	Sb-126	I -126	Lu-163	
695.5	1.6E-03	u Pa-234m	B-	1.17	M	Tl-196m	Bi-195gm	Mo-101	Pb-197m	Kr- 94

Energy 697.9 ～ 722.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Te-129m	Pm-152	Pm-136m	Pb-195	In-127m
						Rn-210	Pm-144	Pr-144		
697.9	0.051	u Bi-214	B-	19.9	M	In-120m2	Sb-132	Sb-132m	Rb- 82	Tc-102m
						Sr- 97	Lu-172	Tb-162	Sb-130m	In-119
						Pr-135	Rn-207	Pr-148m	Pr-148	Po-201m
						Cu- 76gm	Ag-120	Ag-120m	Tb-144m	Y - 85
						Ag-115	Cs-114	Br- 82m	Br- 82	Rb- 82
699.	7.9E-04	u Pa-234m	B-	1.17	M	Sb-127	Te-112	Ce-137	Ir-180	
699.03	5.8E-03	u Pa-234	B-	6.70	H					
699.08	0.037	t Ac-228	B-	6.15	H	Eu-152m1				
699.82	0.016	u Bi-214	B-	19.9	M	Ag-116m	In-103	Ag-116	Br- 73	Ho-170m
						Ho-152				
700.5	=3.1E-06	t Th-228	A	1.9116	Y	Lu-181	Ho-145	Ce-147	Ta-173	At-206
						Fe- 53m				
701.75	0.173	t Ac-228	B-	6.15	H	Rh-100m	Nd-139m	Eu-139	Se- 87	Ir-189m2
702.05	7.1E-03	u Pa-234m	B-	1.17	M	Pd-109	Nb- 94m	Zn- 79	Eu-146	La-146
						La-146m	Re-170			
703.11	0.472	u Bi-214	B-	19.9	M	Nb- 94	Tc- 94	Ce-149	Ga- 67	Eu-146
						Y - 86	Pb-205m	Bi-205	Sn-104	Eu-152m1
704.3	7.5E-05	a Th-227	A	18.72	D	Tb-151	Zr- 97	Br- 80	Sb-120	Sr- 94
						In-120	Na- 33	Rb- 80		
704.64	0.462	a Pb-211	B-	36.1	M	Y - 84m	V - 52	Mn- 52m	Fe- 52	Tl-206m
						Ho-171	Lu-160gm			
704.9	0.047	u Bi-214	B-	19.9	M	Tb-154				
705.2	7.8E-03	t Tl-208	B-	3.053	M	Lu-166m1	Ho-166	Tm-166	La-144	Ag-116m
705.9	3.6E-03	u Pa-234	B-	6.70	H	Pb-191m	Ge- 66	Au-187	Ge- 81	Cs-121m
705.9	4.0E-03	u Pa-234m	B-	1.17	M	Sb-134m	Fr-230	Co- 57		
707.2	3.8E-05	a Th-227	A	18.72	D	I -133	Au-185	Ag-110m	I -119	Br- 90
707.41	0.155	t Ac-228	B-	6.15	H	In-110	Zn- 79	Th-226	Fr-222	Pb-195m
708.3	2.1E-05	a Fr-223	B-	21.8	M	Nd-139m	Re-177	Au-180	Ag-113m	Th-235
708.3	<7.0E-04	u Pa-234m	B-	1.17	M	Er-174	Ho-171			
708.3	3.6E-05	u Pa-234	B-	6.70	H					
708.8	0.017	u Bi-214	B-	19.9	M	Ag-116m	I -114	I -114m	Ag-113m	S - 30
						Pt-187	Cd-104			
710.3	--	u Bi-214	B-	19.9	M	Pd-111	Au-181	Rb- 93	Tm-162m	Sr- 93
710.67	0.075	u Bi-214	B-	19.9	M	Se- 87	Ta-176	Bi-194		
711.2	3.6E-03	a Ra-223	A	11.435	D	Fr-230	Ga- 81	Br- 82m	Rb- 82	
711.5	2.5E-04	u Pa-234	B-	6.70	H	Ho-166m	Cs-125	Po-202	Eu-150m	Pb-191m
						Sn-106	Zn- 80	Ir-186m		
713.7	2.3E-04	u Pa-234	B-	6.70	H	As- 71	Tm-153	Ta-163	Pt-187	Te-137
						Tb-144m	Te-134	Pm-135	Eu-136gm	Mo-101
						Au-189	Na- 27	In-120m1	Sb-124	Nb- 98m
						Er-174	Ac-232	Pt-199	Ru-113	
716.5	4.9E-05	u Pa-234	B-	6.70	H	As- 79	As- 74	Dy-165	Zn- 80	In-127
						Tc-101	Es-252	Tm-152m	Gd-145m	Pd- 95m
						Re-168	Sr- 85	Ho-169	Rh-106m	Po-202
						Ag-106m	Os-185			
718.48	0.019	t Ac-228	B-	6.15	H	Sc- 51	Pm-151	Se- 83	C - 10	
718.5	2.8E-05	a Th-227	A	18.72	D					
719.01	2.6E-05	u Pa-234m	B-	1.17	M	Ba-143	Eu-139	At-203	Rh- 99m	At-205
						Ag-102m				
719.86	0.379	u Bi-214	B-	19.9	M	Nb- 97	Tc- 96m	Nb- 96	Ti- 45	Fr-208
						Te-133	Tl-199m	Pb-199	Tm-168	Au-187
						Pt-185gm	Pr-150	Tc-106	In-103	Cd-119m
						Hg-205	Sr- 81			
722.04	0.072	t Tl-208	B-	3.053	M	At-207	Pr-148	Pt-189	Zn- 71	Gd-145m
						Ce-143				
722.1	5.3E-04	a Fr-223	B-	21.8	M	Tb-154	Tl-184	Pr-138	Gd-140	Bi-203
722.1	3.5E-04	a Th-227	A	18.72	D					
722.98	0.035	u Bi-214	B-	19.9	M	Sn-129m	Sb-129m	Pa-237	Nb- 98m	Pr-150

Energy 723.6 ～ 752.8 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						I -124	Nb- 84	Se- 71	I -131	Ag-108m
						Au-204	Rn-223	Cd-103		
723.6	2.5E-04	a Th-227	A	18.72	D	Eu-154	Pd- 96	Re-177	Eu-156	Tl-196m
						As- 79	Te-115m	Pd-101	Sr- 94	Xe-139
724.15	2.2E-04	a Fr-223	B-	21.8	M	Pd- 94	Pb-197m	Y - 99	Zr- 95	Nd-131
						Au-181	Ce-145	Pd- 98	Rb- 78m	Ho-154m
						Pm-155	Ir-189m2			
726.86	0.62	t Ac-228	B-	6.15	H	Eu-148	Pm-148m	Ir-187	Tb-152m	Rh-116m
						Mn- 59	Sb-131	K - 44	Te-114	Ho-153
727.33	6.58	t Bi-212	B-	60.55	M	Th-235	Ir-196m			
727.8	1.8E-04	u Pa-234	B-	6.70	H	Sb-128	Ho-171	In-107	Ho-160	Pa-230
						Fr-230	I -120m	Tm-160	Ge- 67	In-129
						Rb- 81m	Cs-143			
730.9	1.0E-03	u Pa-234	B-	6.70	H	Th-235	Te-129m	Au-181	Rn-205	Tm-148
						In-108	Ag-100	Tl-190m	Pt-184	Tb-151
						Xe-135	Ca- 47	Kr- 85m	Ir-183	
732.5	1.3E-03	u Pa-234m	B-	1.17	M	Sr- 85m	Sb-130	Ir-178	Au-201	Xe-139
						Mo- 91m	Tc-108	Tm-155		
733.39	0.011	u Pa-234	B-	6.70	H	Ba-136m	Fr-210	Os-177	Ir-172m	Pt-181
733.8	0.043	u Bi-214	B-	19.9	M	At-206	Pa-237			
734.4	9.7E-05	a Th-227	A	18.72	D	Bk-246	Ru- 93m	Ta-177	Am-246m	As- 83
						Ag-101	Kr- 77	Fr-230		
735.5	8.3E-06	a Fr-223	B-	21.8	M	Tl-194m	Hf-183	Re-176	La-144	
735.5	1.5E-04	a Th-227	A	18.72	D	Mg- 32	Pr-146	I -123	Lu-179	Ac-232
						Np-242m	Te-114	Nd-151	Dy-149	Bi-204m2
737.72	0.037	t Ac-228	B-	6.15	H	Cd-125m	Cu- 68m	Eu-160	Hg-189gm	Rh-112
						Eu-138	Y - 82	Xe-142	Eu-150	Ta-186
						Ge- 81m	Np-231			
738.	1.8E-03	u Pa-234	B-	6.70	H	Yb-162	Ar- 43	Rh-116	At-203	
738.4	8.3E-06	a Fr-223	B-	21.8	M	Te-136	Nd-139m	Kr- 89	Rn-206	I -140
738.4	6.6E-05	a Th-227	A	18.72	D	Tm-160m	Cs-146			
739.95	0.012	u Pa-234m	B-	1.17	M	Ba-141	Ta-186	Rn-227	Tc-105	Re-174
						Ga- 73	I -130	Mo- 99	Ho-148m1	Rh-102
						Pd-113	Lu-171	Pu-235	Re-170	In-103
740.73	= 0.04	u Bi-214	B-	19.9	M	Eu-150m	Ag-104	Lu-164	Pm-138m	Rh-104m
						Br- 90	Te-129m	Ho-149m	Eu-142m	Ho-168
742.2	1.5E-06	t Th-228	A	1.9116	Y	Cs-123	Dy-149	Rh- 96	Pm-143	Pr-143
						Pb-195m	Zn- 63			
742.37	1.7E-05	a Fr-223	B-	21.8	M	Tc- 94	Zn- 80			
742.5	=4.0E-04	a U -235	A	703.8E+6	Y	Te-134	Po-207			
742.81	0.08	u Pa-234m	B-	1.17	M	At-211	Np-234	Ta-166	Tl-191m	Pu-238
742.81	3.3E-03	u Pa-234	B-	6.70	H	Pr-149	Te-112	Tb-144	Tb-144m	Re-172m
						Y -102m	Eu-158	Sn-130		
743.56	--	c Ge- 70	NN			Sb-128m	Sb-128	Zr- 97	Nb- 97m	Ag-123
						La-145	Rh-116m	Nd-133m	Am-244	Mn- 52
745.9	5.1E-04	u Pa-234	B-	6.70	H	As- 70	Os-178	Bk-244	Ge- 79m	Pu-235
						Dy-157	Tc- 98	Pr-137	Rh- 98	Pm-154m
						Tl-192gm	Eu-138	Rn-209	Ta-177	
746.4	3.0E-04	a Fr-223	B-	21.8	M	Nb-103	Cd-105	Rn-207	Eu-146	Pm-146
746.4	9.7E-05	a Th-227	A	18.72	D					
748.1	1.6E-04	u Pa-234	B-	6.70	H	Ge- 81	Sb-115	Sm-136	Pb-187m	Nb- 86
						Th-235	Lu-164	Cd-117m	Eu-150	U -239
						Rh-112m	Pr-145			
748.5	2.8E-04	a Th-227	A	18.72	D	Ag-106m	Rh-106m			
748.7	0.015	t Tl-208	B-	3.053	M	Gd-149	Zn- 76	Bi-196m2	Pd-115m	Tl-194m
						Re-180				
750.12	1.8E-05	u Pa-234m	B-	1.17	M	Sr- 91	Gd-140	Ni- 56	Mo-103	Ho-148m1
						I -136m	Ho-170	Tl-199	Cs-122m2	Ag-100
						Re-192	Au-181	Eu-150	P - 37	Ta-168
752.84	0.13	u Bi-214	B-	19.9	M	Ge- 81	La-140	Ba-124	Nb- 86	Ga- 65

Energy 754. ～ 780.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Mn- 48	Ho-166m	Al- 31	Bi-204m2	Y - 94
						Ag-111m	Zn- 74	Tb-148m	Nd-133	Cs-145
754.	1.4E-04	a Fr-223	B-	21.8	M	Pm-134m	Pm-134	I -126	Sb-128m	Ru- 97
754.	9.3E-05	a Th-227	A	18.72	D	Sb-128	Ce-139m	Sm-143m1		
755.	1.9E-03	u Pa-234	B-	6.70	H	Ag-111	Ag-124	Po-201m	Sr- 94	Sm-135
						Tb-164	Al- 29	P - 29	Ge- 79m	Np-232
						Zn- 76				
755.32	1.	t Ac-228	B-	6.15	H	As- 82	Pb-196	Br- 77	Sb-111	Bi-197
						Am-246				
756.9	1.2E-04	a Fr-223	B-	21.8	M	Rh- 94m	Rh- 94	Au-181	Pu-235	Pm-139
756.9	=9.1E-04	a Th-227	A	18.72	D	Nd-141m	Y - 80	Zr- 95	Eu-154	Br- 71
						Ho-172	Tm-166			
758.9	4.0E-04	u Pa-234	B-	6.70	H	Zn- 80	Cs-114	Pb-188	Ho-152m	Cm-244
						Rh-104m	Au-196	Es-252	Os-179	Au-200m
760.3	1.6E-03	u Pa-234m	B-	1.17	M	Ag-122	Rn-227	Mn- 48	La-148	
760.53	4.3E-06	u Pa-234m	B-	1.17	M	La-136				
761.	1.2E-04	u Pa-234	B-	6.70	H	Nb- 88m	Sn-129m	Sb-129	Pr-136	Ho-169
						Sr- 91	Rn-210			
762.2	3.7E-05	a Fr-223	B-	21.8	M	Nd-137	At-204	Tb-164	As- 68	Sn-111
762.2	2.4E-04	a Th-227	A	18.72	D	Pb-199	Rh- 98m	Pm-155	Pd-111m	Rh- 98
						Ce-137m	Xe-120	Po-204	Fr-224	Sr- 83
763.13	0.652	t Tl-208	B-	3.053	M	Eu-144	Fr-211	In-119	Pr-137	Pr-134m
						I -118m	Ag-110m			
764.8	3.1E-04	u Pa-234	B-	6.70	H	Es-250	B - 13	Ho-156	Kr- 94	Eu-145
						Tb-152	Eu-152	Se- 73	Cd-121	Ho-160
765.96	0.078	u Pb-214	B-	26.8	M	Au-186	Ta-170	Tc- 95	Tm-153	Nb- 95
766.3	3.3E-04	a Fr-223	B-	21.8	M					
766.3	2.8E-04	a Th-227	A	18.72	D					
766.38	1.2E-04	u Pa-234	B-	6.70	H	Pu-238				
766.38	0.294	u Pa-234m	B-	1.17	M					
766.51	0.617	a Pb-211	B-	36.1	M	Rh-102m	Er-174	Ca- 47	Se- 81m	Rh-104
						Te-134	Pb-201	Y - 85m	Rn-210	
768.36	4.94	u Bi-214	B-	19.9	M	Ir-186m	Re-186	Ir-186	Ag-104	Rh-104m
						Eu-142	Eu-142m	Eu-138	Re-176	Si- 35
						Sr- 85m	Nb-100			
769.1	3.0E-04	u Pa-234	B-	6.70	H	Ga- 65	Nb-100m	Tm-164	Br- 92	Rb- 95
769.7	0.03	u Bi-214	B-	19.9	M	Nb- 89m	Fm-251	Pd-117	Pt-181	Re-184
770.04	6.3E-03	t Ac-228	B-	6.15	H	Tl-186m1				
770.6	--	c Cu- 65	NN			Te-115m	Pr-138m	Pm-136m	Ni- 65	Zn- 65
						I -136m	Ag-118m	Rh- 97m	Nb-104gm	
772.29	1.49	t Ac-228	B-	6.15	H	Br- 76m	Zr- 87	Ag-124		
772.4	1.2E-04	u Pa-234	B-	6.70	H	Tl-188m1	I -132	I -132m	Xe-132m	Cs-132
773.	1.2E-04	a Th-227	A	18.72	D	Hf-165	W -187	Er-174	Tc- 92	Tb-149m
						I -137	Ir-186m	Ir-186	Ag-100	U -232
						Re-186	Bi-194			
774.1	= 0.06	t Ac-228	B-	6.15	H	Te-131m	Pm-140m	Pm-140	Xe-140	Pb-197m
						In-130m2	Ge- 64	Au-181		
775.3	6.6E-03	a Fr-223	B-	21.8	M	La-143	Br- 72	I -114m	Eu-138	Br- 88
775.3	1.4E-03	a Th-227	A	18.72	D	Dy-149	Ho-151	Au-181	Cd- 98	Os-176
776.56	0.019	t Ac-228	B-	6.15	H	Bi-195gm	Br- 82m	Br- 82	Rb- 82	Rb- 82m
						Bi-196	In-102	Au-184	La-148	Re-174
778.23	0.022	t Ac-228	B-	6.15	H	Sm-141m	Rh- 97	Co- 62m	Rh-112	Pb-195
						Rh-104	Sb-111	Re-178	Mo- 99	Eu-136gm
						Gd-147	Nb- 96	Tc- 96	Tc- 96m	Ho-169
778.6	7.3E-05	u Pa-234	B-	6.70	H	Sr- 83	Te-114	Fr-208	Pm-144	Pm-155
						Tm-166	Tb-152	Eu-152	Ag-119	In-131
780.4	1.4E-03	u Pa-234	B-	6.70	H	Ho-147	Ir-196	Pu-235	Sn-130	Hg-195
						Tb-158	Y - 97m2	Np-242m		
780.5	4.1E-05	a Fr-223	B-	21.8	M	Lu-168m	Lu-171	Er-149m	Nd-154	Pm-152m1
780.5	3.0E-04	a Th-227	A	18.72	D					

Energy 781.3 ～ 808.2 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
781.37	7.8E-03	u Pa-234m	B-	1.17	M	Am-246	Y - 96	Ir-183	Pd-109	Ge- 79m
						Pb-192	Ag-118			
782.14	0.485	t Ac-228	B-	6.15	H	At-209	Pr-149	Y - 99	Sm-139	Zr- 85
						Sn-129m	Te-131m	As- 80	Au-181	Tb-164
783.4	3.8E-05	u Pa-234m	B-	1.17	M	Fr-222	Y - 80	Mn- 50	Rh-114	Th-226
783.4	4.8E-04	u Pa-234	B-	6.70	H	Ce-145	Mn- 50m	Cd- 99	Ce-135	Sb-127
						Hf-183				
784.2	1.3E-04	a Fr-223	B-	21.8	M	Tb-148	Tb-148m	Ce-133	La-146	
784.2	9.3E-05	a Th-227	A	18.72	D					
785.37	1.1	t Bi-212	B-	60.55	M	Mo-107	Ru- 97	Es-252	Gd-143m	
785.96	1.07	u Pb-214	B-	26.8	M	Ag-104m	Ag-104	Np-242	Rh-104	Rh-104m
						Tm-166	Tc- 95	Au-202		
786.1	0.31	u Bi-214	B-	19.9	M	Nb- 95m				
786.27	1.9E-03	u Pa-234	B-	6.70	H	Tc- 95m	Np-234	Ho-170	Tl-192gm	Pu-238
786.27	0.048	u Pa-234m	B-	1.17	M	Bi-201	As- 72	La-145	Dy-149m	Pd- 99
787.4	3.7E-05	a Fr-223	B-	21.8	M	Xe-135m	Te-133	Pb-202m	Au-182	Cs-135m
787.4	9.3E-05	a Th-227	A	18.72	D	Nb- 98m	Nb- 98	Sb-128m	Os-181	Rh- 95m
788.6	0.015	u Bi-214	B-	19.9	M	Br- 80	Xe-139	In-126m	Ir-180	Ho-169
788.74	33.6	La-138	B-	1.05E+11	Y	Pr-138	Pr-138m	Gd-149	Rh-111	Pd- 96
						Se- 81	Ce-138m	Au-181	Er-151m	Dy-149
						Es-249	As- 67	Ir-182	Br- 83	
791.49	0.023	t Ac-228	B-	6.15	H	Rb- 83	At-209	Po-202	Bi-204	Sm-158
						Po-201	Rh-112	Nb- 98m		
791.94	1.0E-05	u Pa-234m	B-	1.17	M	Y - 97m2	Tl-197	Ta-184	Re-184	Re-184m
792.6	1.0E-05	a Fr-223	B-	21.8	M	Tc-106	Tb-150	Fr-230	Tc-104	In-127
792.6	6.6E-05	a Th-227	A	18.72	D	Pt-189				
792.8	= 0.08	t Ac-228	B-	6.15	H	Pd- 97	Pt-187	Ge- 81	Y - 84m	Y - 84
792.8	7.1E-05	u Pa-234	B-	6.70	H	Nb- 99m	Kr- 75	K - 48	I -122	Sb-122
						Sb-130m	Zr- 83			
794.7	=6.0E-04	a U -235	A	703.8E+6	Y	Te-131m	Zr- 87	Pr-154	Au-185	Ga- 67
						Pm-134m	Pm-134	Pa-228	Rn-209	Br- 85
794.9	1.1E-03	u Pa-234	B-	6.70	H	Dy-148				
794.95	4.25	t Ac-228	B-	6.15	H	Tl-188m1				
796.1	4.1E-03	u Pa-234	B-	6.70	H	Cs-134	Tb-149m	Tm-149	Br- 71	
796.8	1.6E-04	a Fr-223	B-	21.8	M	Cd-107	Nd-139m	Er-171	Rh-110	Po-200
796.8	7.5E-04	a Th-227	A	18.72	D	Zr- 87	Zn- 79	Sm-159	Te-112	Nd-151
						Pd- 94	Pd-111m	Ag-118	Fe- 49	La-143
799.7	0.021	u Tl-210	B-	1.30	M	Hg-183	Ag-122	Sn-131gm	Cs-126	Tm-162
799.7	0.01	u Po-214	A	164.3	US	Tm-162m	Au-186	Bk-246	Eu-147	Lu-162
799.7	--	u Pa-234	B-	6.70	H	Ba-143	Am-246m	Gd-143m	Se- 83	Se- 83m
						Nd-154	Hf-182m	Pu-245	Ir-187	Es-252
						Ir-183	Nd-155	Rh- 96	Er-173	
802.3	4.9E-05	u Pa-234	B-	6.70	H	K - 43	V - 46m	Sr- 97	Er-151m	Tm-151m
						Cs-134	Nd-139m	Te-129	Br- 88	Br- 84
						Br- 85	Zn- 79			
803.1	5.0E-03	u Tl-206	B-	4.199	M	Th-226	Ba-130m	Mo- 89	Bi-206	V - 48
803.1	--	c Pb-206	NN							
803.1	1.2E-03	u Po-210	A	138.376	D					
803.5	8.7E-04	a Fr-223	B-	21.8	M	Br- 91	Ho-150m	Co- 55	Ho-150	Rb- 81
803.5	9.1E-04	a Th-227	A	18.72	D					
804.1	9.9E-04	u Pa-234	B-	6.70	H	Tc-109	Ag-106m	Dy-145m	Eu-141m	
804.9	1.9E-03	t Po-216	A	0.145	S	Rh-106m	Pr-150	Eu-159	Es-252	Rn-227
						Re-181	Ra-219	Rn-208	Eu-143	
805.8	4.3E-03	u Pa-234m	B-	1.17	M	Xe-140	Ag- 99	Pa-238	Ga- 68	Ag-114
805.8	4.0E-03	u Pa-234	B-	6.70	H	Sn-127				
806.17	1.22	u Bi-214	B-	19.9	M	Sr- 94	Lu-181	Ru- 95	Cs-127	Tm-165
807.5	4.6E-05	a Th-227	A	18.72	D	Cu- 68	Pr-135	At-208	Rh- 99	Br- 89
						Tb-162	Ho-162	Bi-195gm	Rh- 97	
808.2	3.0E-03	u Pa-234m	B-	1.17	M	Ga- 64	Ca- 47	As- 67	Tb-148m	Lu-182
						Pm-149	Mn- 51	Tm-152	Pu-238	Zn- 77

Energy 808.4 ～ 834.0 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
808.4	5.8E-05	u Pa-234	B-	6.70	H	Tm-152m	Gd-145	Ag-118m	Rh- 96m	In-121
						In-107	Ge- 65	Ir-197gm		
810.	0.509	u Pa-234m	B-	1.17	M	Ar- 44	P - 36	Sr- 96	Au-180	Nd-139m
810.	3.1E-04	u Pa-234	B-	6.70	H	Pm-142	Ho-152m	Tc- 90m	Pd- 99	Cd-100
						Lu-172	Ta-166	Pm-152m1	Es-250	Ho-166m
						Nb- 96	Eu-152m1	Ar- 33		
811.5	2.0E-04	u Pa-234	B-	6.70	H	Mn- 58	Co- 58	Tc- 91	Tm-153	Tm-175
						Eu-156				
812.2	3.1E-04	a Fr-223	B-	21.8	M	Ni- 56	Lu-166m1	I -132	Br- 80	Ho-170m
812.2	2.5E-03	a Th-227	A	18.72	D	As- 69	Nb-104gm	Tc- 96	Kr- 92	I -136m
						Sb-129	Au-189	Rb- 94	Pm-133	Gd-143
813.77	7.0E-03	t Ac-228	B-	6.15	H	In-118	Rb- 96	In-118m1	Sb-118	Es-249
						Sb-128	Np-242m	Rh-110	Tc- 91	
814.2	4.9E-04	u Pa-234	B-	6.70	H	Sb-132	Pr-144	Ho-154m	Pm-144	Te-113
						At-207	Ag-124			
815.	0.038	u Bi-214	B-	19.9	M	Tl-195	Ce-131m	Np-232	Rb- 92	Rb- 96
						As- 82m	F - 23	Ag-110	Ag- 99	Ta-164
816.54	2.2E-05	a Fr-223	B-	21.8	M	La-140	Pm-139	Ho-168	Ir-197gm	Tm-168
						Sb-130m	Bi-203	Pt-187	Sb-132	
816.71	0.03	t Ac-228	B-	6.15	H	Cu- 61	Te-129m	Ag-120	Tb-149	Yb-153
						Fr-210	Ag-121			
818.	1.2E-04	a Th-227	A	18.72	D	Eu-144	Br- 77	Sb-133	Cm-244	Np-240m
						In-110m	Ag-110m			
818.2	1.0E-03	u Pa-234m	B-	1.17	M	Es-252	Ag-110	Lu-182	Cs-136	Ba-136m
						As- 82m	Sb-116			
819.2	3.0E-03	u Pa-234	B-	6.70	H	In-116	In-116m1	Bi-201	Pa-232	U -239
						Pb-194	Np-232	In-122m1	Re-176	Rn-208
						Te-112				
821.18	0.158	u Bi-214	B-	19.9	M	Ru-109	Pb-203m1	Bi-203	Lu-160gm	Kr- 93
						Tc- 95m	Ho-168	Tm-168		
821.2	0.014	t Tl-208	B-	3.053	M	Lu-154	Ni- 67	Eu-160	N - 18	Sb-134m
823.1	1.2E-04	a Fr-223	B-	21.8	M	Sn-125	Tc-100	Rh-100	Te-131m	Po-203
823.1	2.3E-03	a Th-227	A	18.72	D	Mo- 99	Sn-127	Hf-182m	Pm-132	Mn- 60m
824.2	2.0E-03	u Pa-234	B-	6.70	H	Ho-171	Rh- 98m	Rb- 90m	Gd-143m	
824.93	0.05	t Ac-228	B-	6.15	H	Ag-106m	Sn-127	Ce-137m	Rh-106m	
825.1	3.0E-03	u Pa-234	B-	6.70	H	Pb-203m1	Bi-203	Lu-162		
825.6	1.4E-03	u Pa-234m	B-	1.17	M	Re-180	Ag-119			
826.	7.9E-04	a Fr-223	B-	21.8	M					
826.	1.8E-04	a Th-227	A	18.72	D					
826.3	0.11	u Bi-214	B-	19.9	M	Tb-165	Pb-201	Co- 60	Co- 60m	Cu- 60
						Sr- 95	Mo- 93m	In-118	Yb-152	Os-181
						In-125	Sb-118			
828.5	1.8E-04	a Th-227	A	18.72	D	Tb-150m	Nd-139m	Br- 82	Rb- 82m	As- 78
						Ga- 81	Se- 81	Ge- 67	Tl-200	Ce-135
						Bk-250				
829.3	5.8E-04	u Pa-234	B-	6.70	H	Es-250m	Cd-107	Re-190	Pm-138m	Es-250
						Ir-188	Re-188			
830.49	0.54	t Ac-228	B-	6.15	H	Tm-168	Ag-120m	Lu-166m1	Se- 71	Tb-151m
						Pm-149	Ho-166m	I -138	Zn- 76	Pu-233
831.5	6.6E-03	u Pa-234	B-	6.70	H	Ta-168	La-148	In-122m1	Os-181	In-128m
						Rb- 90	Rb- 90m	Bi-195gm		
832.	1.5E-05	t Th-228	A	1.9116	Y	Cd-117	Eu-150m	Pm-150	Kr- 79	
832.01	3.52	a Pb-211	B-	36.1	M					
832.39	0.028	u Bi-214	B-	19.9	M	Lu-166m1	Ag- 99	Ce-147	Rh- 96	Rh- 96m
						Re-179				
833.	1.1E-05	a Bi-215	B-	7.6	M	Pd- 98	In-127m	Cu- 66	Pm-251	Pm-149
= 833.	=1.1E-03	a Rn-219	A	3.96	S	Tm-153	Au-187			
833.9	1.9E-05	a Fr-223	B-	21.8	M	Ga- 66	Bk-246	Nb- 98m	Am-246m	As- 83
834.01	--	c Ge- 72	NN			As- 72	Ga- 72	Ga- 80	As- 83	In-104
						Np-241	Rb- 81	V - 54	Ta-170	Kr- 88

Energy 835.7 ～ 866. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
835.71	1.61	t Ac-228	B-	6.15	H	Fr-228	Nb- 95m	Tc- 95m	Pb-195	Ce-137m
						Pa-228	Ir-196m	Zn- 77	Pd-111	Ag-124
						As- 81	Nb-104gm	Kr- 87	Rh-100m	Cu- 59
837.3	1.4E-04	a Fr-223	B-	21.8	M	Se- 83	Pr-137	Dy-149	I -135	Po-205
837.3	3.8E-04	a Th-227	A	18.72	D	Na- 25	Sb-133	Rb- 94	Fr-224	Bi-199
						Rh-110m				
839.04	0.587	u Pb-214	B-	26.8	M	Pb-203m2	Ho-159	Ho-158m2	Br- 74m	Am-246
						Re-190				
839.5	4.9E-05	u Pa-234	B-	6.70	H	Pm-154m	Pm-154	Sb-130m	Sb-130	Y - 98m
						Pm-140m				
840.38	0.91	t Ac-228	B-	6.15	H	Lu-171	Bk-243	Rh- 97	Ra-222	Bi-195gm
840.4	9.0E-03	u Bi-214	B-	19.9	M	Ba-142	Rh-110	Os-183m	Pu-245	Cl- 39
						Sn-125m	Cl- 33	At-204		
842.2	7.9E-05	a Fr-223	B-	21.8	M	Ir-184	Pm-152	Ir-186	Rn-208	Eu-152ml
842.2	5.6E-04	a Th-227	A	18.72	D	Co- 61	Bi-199	Zn- 75	Ho-162m	Cs-122
						Lu-160gm				
844.1	6.8E-04	u Pa-234	B-	6.70	H	Ge- 82	Os-172	Te-119	Ru-111	Mg- 27
844.1	1.1E-03	u Pa-234m	B-	1.17	M	Si- 27	Mo- 89	Sb-116m	Sb-128m	Au-184
						Y - 92	Te-133	La-144	Te-129m	Mo- 93m
						Tb-164	At-208			
846.1	8.2E-05	u Pa-234	B-	6.70	H	Ti- 43	Kr- 87	Dy-151	In-123	Po-199
						Sb-117	In-117m	Cs-135m	La-133	Fr-228
846.7	7.9E-04	a Fr-223	B-	21.8	M	Cu- 72	Xe-125	Ho-158gm	Cs-124	Bi-196
846.7	1.4E-04	a Th-227	A	18.72	D					
846.78	--	c Fe- 56	NN			Mn- 56	Co- 56			
847.16	0.026	u Bi-214	B-	19.9	M	Nb- 99m	I -134m	Cs-134	I -134	Pa-237
						Bi-203	Ho-158gm	Nb-102m	Ta-166	Tc- 96m
848.7	5.6E-05	a Th-227	A	18.72	D	Mn- 52	Pr-145	Sn-129	Re-176	
848.9	4.3E-05	u Pa-234	B-	6.70	H	Xe-137	Sm-142	Pa-238	Br- 73	Tc- 94
						Tc- 96m	Tc- 96	Nb- 96	Po-200	Se- 73m
851.5	6.2E-03	u Pa-234m	B-	1.17	M	Cr- 57	Nd-154	I -114m	Pm-157	Ho-158gm
						Zn- 77	In-112	Tc-108	Tm-158	Ag-112
						Os-183				
851.7	1.2E-04	u Pa-234	B-	6.70	H	Np-231	Pu-238	Pb-203m2	Y - 80	Es-249
853.17	1.2E-02	t Ac-228	B-	6.15	H	Hf-171	Ni- 65	At-210	Ho-169	Pr-150
						Lu-171	Tb-142	Rn-207	Rn-211	Tb-149
						Nd-155	Pa-237			
854.3	6.6E-05	a Th-227	A	18.72	D	Bi-192gm	Y - 98	I -139	Tm-160	Bi-197
						Rb- 99	Ho-170	Cu- 58	La-135	W -189
						Au-182	Ru- 97	Rn-209		
857.3	5.6E-05	a Th-227	A	18.72	D	Ca- 49	Cd-115	I -133	Sb-126	Eu-147
						Pm-136	Os-176	Ta-172	I -134	
857.7	5.8E-05	u Pa-234	B-	6.70	H	Ta-175	Tm-175	Ag-104		
858.3	<2.1E-06	a Fr-223	B-	21.8	M	Rh-104m	Pm-136m	La-133	Lu-181	Y - 83
858.3	2.2E-03	a Th-227	A	18.72	D	I -117	Ge- 81			
860.	1.5E-03	u Tl-210	B-	1.30	M	Lu-179	Pm-149	Sn-127	Cd-125	Pm-150
						Tm-164				
860.56	4.47	t Tl-208	B-	3.053	M	Yb-163	Zn- 78	Ta-170	Cd-117m	Po-206
						In-106m	Pt-187	Au-180	Sb-117	In-102
						Tm-160m	Kr- 77	Ca- 51	As- 80	In-117m
						Br- 85				
863.	5.4E-05	a Fr-223	B-	21.8	M	I -116	Tb-149	Sm-159	Br- 72	Ta-164
863.	1.8E-05	a Th-227	A	18.72	D	As- 69	Pm-136	K - 48		
863.2	1.2E-04	u Pa-234	B-	6.70	H	Nb- 89	Ag- 98	Es-250	Re-174	Pa-238
						Sn-106	Lu-164	Mn- 58	Co- 58	Te-133m
						Ta-166	Nd-154	Ho-150m	Np-232	Ir-178
						Ce-149	W -187			
865.93	5.9E-03	a Pb-211	B-	36.1	M	Er-161	Pa-237	Se- 73	Ag-111	Br- 85
						Tc-102	Ag-102	Zn- 79	Pb-187m	
866.	--	u Bi-214	B-	19.9	M	Rn-211	Ar- 44			

Energy 866.8 ～ 897.7 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
866.8	1.1E-03	u Pa-234m	B-	1.17	M	Ho-169	Ir-197gm	Pr-137	Se- 83	Pa-232
						Ag-111	Eu-156	Kr- 89		
867.5	2.5E-05	a Fr-223	B-	21.8	M	As- 74	Bi-197	Np-232	Np-240	Eu-152
867.5	6.6E-05	a Th-227	A	18.72	D	Ga- 82				
867.9	--	c Ge- 73	NG			Ga- 74	La-140	Sr- 85	At-206	Br- 88
867.9	--	c Ge- 74	NN							
869.7	3.1E-04	u Pa-234	B-	6.70	H	Er-151	Pr-148	In-121	Tc- 95	Dy-149
						Eu-148	Fe- 52m	Bk-244		
870.46	0.044	t Ac-228	B-	6.15	H	Eu-152m1	Lu-179	I -138	Se- 71	Te-135
						Ir-180	Mn- 57	N - 17	Nb- 94m	Au-184
						Tc- 94m	Tc- 94	Nb- 94	Dy-149	Ce-135
						Zn- 69				
873.07	0.018	u Bi-214	B-	19.9	M	Cs-138m	Cs-138	Ge- 69	Ho-160	Sn-134
						Po-205	At-205			
873.17	0.031	t Ac-228	B-	6.15	H	Eu-154	Tb-154	Tb-154m1	Ho-154	Zn- 77
						Rh-106				
874.	5.8E-05	u Pa-234	B-	6.70	H	Pb-191m	Pb-203m2	Pu-240	Pm-148	
874.44	0.047	t Ac-228	B-	6.15	H	Zn- 79	Ne- 24	Cd- 98	La-135	S - 39
						Co- 62m	Mn- 59	Tc- 94m		
876.	4.0E-03	u Pa-234	B-	6.70	H	I -138	I -133	In-108	Bi-195gm	Tm-166
						Cu- 62	Sr- 93	Er-163	Ge- 81	Ru-105
876.2	5.8E-04	a Fr-223	B-	21.8	M	Tm-156	Kr- 92	I -118	Pm-150	Mn- 62
876.2	1.5E-04	a Th-227	A	18.72	D					
877.46	0.014	t Ac-228	B-	6.15	H	Mo-101	Tm-148	In-122m2		
878.03	0.012	u Bi-214	B-	19.9	M	Hg-193m	Cu- 59	In-104		
878.2	1.1E-04	a Th-227	A	18.72	D	Si- 36	Tb-154	Pb-195m	As- 79	Rh- 97
880.5	=1.7E-02	u Pa-234	B-	6.70	H	Ho-160	Tb-160	C - 18	Xe-140	Sm-159
						Xe-134m	Cs-126	Po-199m	Ag-108	Tb-150
						Pm-156	Pm-140m	Ce-143	Lu-164	Os-185
880.76	6.2E-03	t Ac-228	B-	6.15	H	Cd-117	Fm-251			
880.9	3.8E-03	u Pa-234m	B-	1.17	M	Bi-206	Tl-188m1	Ho-170m	Sr- 76	Zn- 75
						Br- 84	Rb- 84	Sb-132m	Pm-149	
883.24	3.5E-03	u Pa-234m	B-	1.17	M	Y - 83	Tb-162	Tb-148m	Co- 65	Zn- 79
883.24	0.015	u Pa-234	B-	6.70	H	Np-238	Cs-122	Cs-122m2	Eu-141	Eu-141m
						Pb-195				
883.3	0.011	t Tl-208	B-	3.053	M	Rb- 76	Ag-113	Se- 83	Ho-147	Po-204
						Tc-104	Ho-172	Tl-195	La-128	Ir-192
						Ho-156	Lu-168m	In-110	Ag-110m	Br- 78
						Cu- 70m	Rb- 81m	I -134m		
887.28	7.1E-03	u Pa-234m	B-	1.17	M	Na- 32	Pa-238	Pm-133	Au-200	Ce-131
						Pm-141	Te-117	As- 74	Nb- 87	Pd- 96
887.33	0.027	t Ac-228	B-	6.15	H	Sb-114	Ga- 67	Nd-155	Os-183	Sr- 93
889.	1.6E-03	a Rn-219	A	3.96	S	Tb-162	Ho-162	S - 40	As- 78	Am-240
						Sc- 46				
890.1	4.3E-05	u Pa-234	B-	6.70	H	Eu-142	Lu-169	Bk-250	Os-183	Rh-114m
						Bi-195gm	Ge- 83	Pm-144	Po-201	Ho-170
891.	1.8E-05	a Th-227	A	18.72	D	Ir-182	Fr-206	Nb- 90	Ir-180	Ar- 43
						Pm-154				
891.8	--	u Bi-214	B-	19.9	M	Xe-142	Ag-102	Bi-197	Bk-244	Sr- 97
893.	3.7E-05	a Fr-223	B-	21.8	M	Ba-129m	Sr- 92	Ce-149	Tb-154m1	Ru- 91
893.	1.2E-05	a Th-227	A	18.72	D	Y - 97m1	Tc-104			
893.41	0.378	t Bi-212	B-	60.55	M	Gd-147	Bi-203m	Po-203	Eu-145	Bi-195gm
						As- 72	Tm-175	Pa-228	Pm-156	Pa-232
						Sb-112	Na- 31			
896.1	2.4E-04	a Fr-223	B-	21.8	M	Re-184	Re-184m	Ta-184	Re-182m	Sn-104
896.1	1.0E-04	a Th-227	A	18.72	D	La-142	Pr-154	Bi-206	Ba-143	Ba-142
						Pd- 98	Pt-187	Np-240	Pb-197	Lu-168m
						Pm-148	In-123m	In-119m	Ho-157	Po-209
						Bi-203				
897.7	1.5E-03	a Po-211	A	0.516	S	Cm-242	As- 67	Sb-111	In-119m	Tb-158

Energy 897.7 ～ 930.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Tb-158				
897.78	0.259	a Tl-207	B-	4.77	M	Bi-207	Am-244	Rb- 88	Y - 88	Tm-164m
897.78	--	c Pb-207	NN			Cd-107	Cu- 69			
898.67	5.2E-03	u Pa-234	B-	6.70	H	Sr-100	Cd- 98	Pa-230	Yb-177	Sn-132
						Pb-204m	Bi-204	Sn-130m	Nd-133m	La-132m
						K - 42	Sc- 42m	Xe-123	Ir-178	Tm-162m
901.23	0.016	t Ac-228	B-	6.15	H	Re-174	Po-211m	Tm-162	Tm-162m	Lu-172
						Fr-210	Rh-108	Xe-125	Cu- 70m	P - 36
						Pu-235				
904.2	0.77	t Ac-228	B-	6.15	H	Re-180	Tc- 91	Re-174	At-209	Re-184
904.2	5.4E-04	u Pa-234	B-	6.70	H	Re-184m	Ta-184	Ho-171	Pm-148	Po-201
904.29	0.085	u Bi-214	B-	19.9	M	Kr- 89	Fr-228	Rh-110m	Pm-132	Pa-228
						Pa-238	S - 39	Dy-155	As- 70	Pt-181
908.1	=1.7E-06	t Th-228	A	1.9116	Y	Y - 96m	Ta-166	S - 37	In-129m	Tm-152m
						Ce-137m	Sr- 94	Te-114	Ni- 57	Ta-168
						Sc- 51	Ho-171	Tm-149	Cs-148	Pb-201
						I -128	La-130			
908.2	2.0E-04	a Fr-223	B-	21.8	M	Cs-140	Sb-128m	Au-202	Tb-145	In-126m
908.2	2.0E-03	a Th-227	A	18.72	D	In-126	Bi-203m	Po-203	Cu- 61	Nd-154
						Am-237	In-121m	Sb-110	Sr- 81	
910.	6.2E-04	u Tl-210	B-	1.30	M	Sr- 89	Y - 89m	Zr- 89	Co- 61	Xe-141
910.	1.5E-05	a Th-227	A	18.72	D	Te-121m	Nd-139m	Pu-235	Zn- 71	Pu-245
911.2	25.8	t Ac-228	B-	6.15	H	Pm-154	Pa-238	Ge- 67	Pa-228	
911.3	1.1E-05	a Fr-223	B-	21.8	M	Sm-141m	Y - 97m2	Pb-204m	Bi-204	Po-207
						Ru-107	I -133m	Ir-182	Tm-172	Lu-172
913.6	6.2E-06	a Fr-223	B-	21.8	M	Nb- 92m	Sn-104	Te-119m	Te-133m	Pt-187
						Ir-187	Pd- 95m	Br- 85	Sn-129	Co- 63
						I -136m	Rn-210	Zn- 59	Br- 73	Tc-105
						Au-187				
915.74	0.026	u Bi-214	B-	19.9	M	Te-133m	Ge- 67	Nb- 86	Cs-124	Pm-148
						Pt-179	Pm-148m	Sn-125	Ce-137	Np-240m
						Am-240				
916.5	3.8E-05	u Pa-234	B-	6.70	H	Gd-143m	In-103	Nd-139	Pa-236	
917.8	5.0E-03	u Bi-214	B-	19.9	M	Cd-123	Ho-162m	Bi-198m1	Rb- 76	Ce-137m
						O - 22	Fr-211			
918.4	1.6E-04	u Pa-234	B-	6.70	H	Bi-204m2	Re-168	Bi-204	Pa-230	Y - 96
918.97	0.027	t Ac-228	B-	6.15	H	Np-238	Am-238	Y - 94	Ga- 64	Pm-152
						La-143	In-121			
920.	1.1E-05	a Th-227	A	18.72	D	La-140	Sr- 85m			
920.5	4.6E-05	u Pa-234	B-	6.70	H	Nb- 89	In-119m	Au-181	Pr-145	Ta-184
						Bi-208m				
921.7	0.013	u Pa-234m	B-	1.17	M	V - 55	Pm-154	Si- 36	Sn-134	Bk-244
						Cd-105	Eu-150m			
921.98	0.015	t Ac-228	B-	6.15	H	Cs-125	Ag-100m	Pr-146	Xe-116	
924.03	7.5E-03	t Ac-228	B-	6.15	H	At-206	Cd-119m	V - 54	Ag-104	Nd-139
						Te-117	Np-238	Ho-153	Es-252	
925.	0.013	u Pa-234	B-	6.70	H	La-146	Br- 85	Cd-101	Te-112	Er-148
						La-140	Cs-126	Pr-140	Dy-146m	Ho-146
926.	2.8E-03	u Pa-234	B-	6.70	H	In-121	Mn- 58	Te-137	Sr- 91	Ag-120m
						Ag-104	Nd-137			
926.5	2.3E-05	a Fr-223	B-	21.8	M	Ce-137	Bi-199	Fr-206		
926.72	0.012	u Pa-234	B-	6.70	H	Tm-160m	Eu-160	Zn- 77		
926.72	1.2E-03	u Pa-234m	B-	1.17	M					
927.	6.6E-06	a Th-227	A	18.72	D	Bi-202				
927.6	0.047	t Tl-208	B-	3.053	M	Tc- 91m	Nb- 99m	Pb-195m	Sb-126m1	Nb-100
						V - 48	Te-112	Nb-100m	Ti- 51	Sn-129
930.2	0.033	u Bi-214	B-	19.9	M	Gd-147	Nd-137	I -118m	Ag-105m	Bk-250
						Al- 34	Np-241	Pm-154m	Ar- 35	Tm-156
930.93	0.012	t Ac-228	B-	6.15	H	Pm-138m	Te-133	Re-176	Hg-195	Xe-121
						Co- 55	Co- 64	Cs-127	In-123	Rh-108

Energy 934.0 ～ 970. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Cd-117m	Br- 73	Bi-200	Ho-156	Sr- 96
						Er-161	Pr-150	Sb-116	La-145	In-116
						Ho-170	Ga- 65	Lu-166ml	Hg-193m	Rb- 81m
934.06	3.03	u Bi-214	B-	19.9	M	La-124gm	Re-178	Th-235	Eu-147	Sb-131
						Ir-186	O - 21	Cd-115m	Pm-156	Cs-146
934.1	0.05	u Bi-214	B-	19.9	M	Pr-135	Ho-170	Cd-105	Mo-101	
934.5	1.0E-02	u Bi-214	B-	19.9	M	Nb- 92m	Y - 92	Te-131	Nb- 92	Si- 36
						Pr-148m	Cd-123m	Tb-145		
935.8	1.1E-04	u Pa-234	B-	6.70	H	In-128	V - 52	Mn- 52m	Mn- 52	Sb-113
936.3	1.8E-03	u Pa-234m	B-	1.17	M	Bi-201	Lu-176m	I -121	In-125	Cd-100
						Np-238	Ga- 81	I -140	Lu-166ml	Pb-191m
938.	9.7E-06	a Th-227	A	18.72	D	Ho-162m	Hg-205	La-123	In-110	Ag-110m
						Np-240m	Ga- 82			
938.65	0.013	u Bi-214	B-	19.9	M	Sr- 81	Gd-149	Ir-194	Lu-170	As- 81
939.6	0.018	u Bi-214	B-	19.9	M	Rn-208	Ir-197gm			
939.87	9.0E-03	t Ac-228	B-	6.15	H	Pr-138m	Pd- 97	Rh- 99	Sb-113	Pu-235
941.6	4.6E-05	a Fr-223	B-	21.8	M	Tm-175	Cd-119	Np-238	Ho-170	Am-238
941.6	6.7E-05	a Th-227	A	18.72	D	Mg- 28	Mo- 90	Cm-242	Rh- 95	Ag-104
						Rh-104m				
941.94	2.5E-03	u Pa-234m	B-	1.17	M	Yb-177	Am-244m	Sr- 77	Mn- 62	Tl-189
941.94	7.3E-05	u Pa-234	B-	6.70	H	Pb-190	Te-119m	Bi-196	Fr-208	
943.34	0.017	u Bi-214	B-	19.9	M	Hf-182m	In-104	Sb-131	Tc- 93m	
944.2	0.095	t Ac-228	B-	6.15	H	V - 48	Eu-158	Tb-158	Eu-156	I -118m
						Pu-235	Ta-177	Np-242	Sr- 95	
946.	9.9E-03	u Pa-234m	B-	1.17	M	Pa-228	Ho-158gm	Pb-201	Bi-199	Bk-243
946.	0.021	u Pa-234	B-	6.70	H	Ho-158gm	Rn-211			
947.7	2.6E-03	u Pa-234	B-	6.70	H	Mg- 31	Te-121m	Zn- 60	Y - 93	Rh-108
						Tc- 95	In-122	Rb- 89	Mo- 93m	
947.98	0.106	t Ac-228	B-	6.15	H	Cd-105	Tc- 90m	Tc- 90	Au-194	In-127m
949.3	5.0E-06	a Fr-223	B-	21.8	M	Ho-158gm	Nb-102m	Ba-142	Yb-152	Fr-228
949.8	5.5E-03	u Bi-214	B-	19.9	M	As- 81	Mo- 93m			
951.	0.022	a Pb-211	B-	36.1	M	Sb-109	Ga- 78	Dy-148	Sr- 85	
952.12	0.167	t Bi-212	B-	60.55	M	Ge- 82	Y - 83	Rn-208	Pa-230	Ac-230
952.2	6.0E-03	u Bi-214	B-	19.9	M	Cu- 60	Os-177	Pa-238		
952.7	1.3E-04	u Pa-234	B-	6.70	H	Cd-121m	In-130	Gd-145	Sr- 92	Br- 89
						Sr- 97	Y - 95	Sn-111	Pb-196	Bi-202
						Pb-202m	I -132			
958.61	0.28	t Ac-228	B-	6.15	H	Yb-165	Ho-172	Lu-176m	Pr-154	Lu-183
						In-123	Ho-170	K - 45	Pb-197m	Rn-210
958.7	8.3E-06	a Fr-223	B-	21.8	M	I -116	La-146m	Tm-156	Tb-144m	
958.7	5.8E-05	a Th-227	A	18.72	D					
960.	1.2E-04	u Pa-234	B-	6.70	H	Ho-170m	Nd-155	Au-202	Tl-202	
960.	9.0E-04	u Pa-234m	B-	1.17	M	Mg- 29	Eu-156	Pt-181	Lu-169	Bi-202
						Mo- 99				
961.61	0.012	u Bi-214	B-	19.9	M	Pm-152	Eu-152ml	Ca- 52	Ir-184	V - 55
						Bi-195gm	Ti- 45			
962.06	--	c Cu- 63	NN			Cd-105	Pm-154	Zn- 63	Ta-175	Tb-158
						Tb-160	Ho-160	Sn-130m	Zn- 79	Br- 89
						Np-238	Am-238	Sm-143ml		
964.08	0.362	u Bi-214	B-	19.9	M	Cd-103	Pm-152	Eu-152ml	Rb- 92	Co- 65
						Sr-100	Rn-208	Eu-152	Po-201m	U -239
964.77	4.99	t Ac-228	B-	6.15	H	Tl-196	Pa-228	Zn- 71m	Zn- 71	
965.	1.0E-02	u Bi-214	B-	19.9	M	In-120m2	Zn- 80	Tm-153		
965.8	7.6E-04	u Pa-234	B-	6.70	H	Pr-134m	Pr-134	Tb-160	Ho-160	Sb-129
						Cs-142	Bi-195gm	Pu-240	I -130	Nb-103
968.97	15.8	t Ac-228	B-	6.15	H	Po-201m	Tl-195	Sb-124	Pt-199	Os-179
						In-108m	Os-178	Nb-100	Pa-228	Pa-232
						I -128	Cs-128			
970.	3.3E-06	a Fr-223	B-	21.8	M	In-126	Pm-154	In-124m	In-124	Zn- 61
970.	2.8E-05	a Th-227	A	18.72	D	Y - 97ml	Ta-178	Eu-152ml		

Energy 971.7 ～ 1013.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
971.7	9.3E-06	a Th-227	A	18.72	D	Rb- 77	Ta-174	Te-112	Nb- 98	Fr-230
						Pm-138m	Y - 92	Nd-136	Sb-116m	Sb-116
						In-129m	Rn-207	I -119		
975.1	4.3E-05	u Pa-234	B-	6.70	H	Po-202	Sb-132m	Sb-132	Pr-134m	Pr-134
						Ti- 45	Y - 84m	Tb-152	In-122ml	Na- 25
						Sb-114	La-130	Ar- 43	I -120	
975.2	2.5E-06	a Fr-223	B-	21.8	M	Ti- 42	Cd- 99			
975.96	0.05	t Ac-228	B-	6.15	H	Bi-197	I -120m			
976.18	0.019	u Bi-214	B-	19.9	M	Te-119m	I -139	Ga- 76	I -136	Sm-159
						Tb-158	Eu-158			
978.2	1.4E-04	u Pa-234	B-	6.70	H	Ir-187	Rb- 96	Am-244m	Se- 71	Si- 36
						Pm-135	Pu-233	Cm-251	Te-133m	
978.7	1.1E-05	a Fr-223	B-	21.8	M	Pr-134m	Pr-145	Mo- 93m		
979.48	0.026	t Ac-228	B-	6.15	H	Sn-127	Lu-168m	Te-119m	Zn- 79	Zn- 78
980.3	=7.1E-03	u Pa-234	B-	6.70	H	La-135	Ta-172	Tb-142	Rn-210	Po-206
						Fr-226	He- 8			
981.6	1.2E-03	u Pa-234	B-	6.70	H	Ge- 67	Rb- 99	Pm-139	Co- 63	Nd-141
982.7	0.073	t Tl-208	B-	3.053	M	Nd-139m	Xe-137	Lu-180	Mg- 28	Sr- 76
						Fr-211	Sm-141m			
984.2	2.6E-03	u Pa-234	B-	6.70	H	Tc- 90m	V - 48	Sc- 48	Dy-151	Lu-168m
						Sb-118m	Np-238	Lu-166ml	Na- 27	Sb-110
						Ga- 82	Lu-170	Rb- 97	Na- 30	I -139
						Cl- 39				
987.71	0.077	t Ac-228	B-	6.15	H	Am-246m	Rb- 93	Sb-115	N - 16	Ta-168
						Ir-186m	Ir-197gm	Lu-170	Ca- 49	Ir-187
						Tb-146ml	Pu-245	Bi-205	Pb-205m	Np-240
						Cd-121m	Tb-149m	Se- 83m		
988.63	0.077	t Ac-228	B-	6.15	H	Rb- 77	Sm-157	Ag-113	Sb-120	Cd-123m
						V - 54				
989.34	1.0E-02	u Bi-214	B-	19.9	M	Xe-140	Tm-158	Es-250m	Bk-250	Sb-126
989.5	1.6E-04	u Pa-234	B-	6.70	H	Sb-132				
990.	2.1E-06	a Fr-223	B-	21.8	M	Fr-228	Na- 25	La-148	At-208	In-120
990.	3.3E-05	a Th-227	A	18.72	D	Y - 97m2	K - 43	Bi-201		
991.49	1.0E-02	u Bi-214	B-	19.9	M	Sb-112	La-132m	Ga- 64	Pu-233	
992.	1.3E-04	u Pa-234	B-	6.70	H	Tm-174	Er-151	Nd-134	Lu-174m	Po-207
992.9	=1.5E-06	t Th-228	A	1.9116	Y	Rb-114m	Sn-132	Pd-101	Bi-200	Tb-154m2
						Tc- 94m	Cu- 69	As- 79	Ba-126	As- 74
994.6	9.9E-05	u Pa-234	B-	6.70	H	Se- 86	Ce-137m	Pb-195	Bi-197	Rn-210
995.	=1.7E-06	a Fr-223	B-	21.8	M	Fe- 63	Eu-160	Rh- 97m		
995.	6.1E-06	a Th-227	A	18.72	D					
996.1	4.1E-03	u Pa-234m	B-	1.17	M	Eu-152ml	Tb-154	Tb-154ml	Eu-154	Sr-101
						Cd-125	Na- 24			
997.7	7.3E-05	u Pa-234	B-	6.70	H	Hg-207	In-110	Tb-147m	Te-131	Lu-166
						In-106	Br- 89	Te-121m	Ta-175	Pb-194
999.8	2.9E-06	a Fr-223	B-	21.8	M	Lu-170	Dy-155	Ho-154	Au-181	Ce-131m
999.8	2.8E-05	a Th-227	A	18.72	D	Nd-155	Nd-134	Re-181		
1000.69	5.0E-03	t Ac-228	B-	6.15	H	In-104	Pu-233	Eu-144	Pr-136	Te-133
1001.03	0.837	u Pa-234m	B-	1.17	M	Eu-136gm	Pu-238	Ba-142	Nd-155	Po-205
						In-122m2	In-122ml	Tb-144m	Po-199m	Sc- 44m
						Na- 26				
1004.	<1.8E-03	t Tl-208	B-	3.053	M	Lu-172	Tm-148	Re-174	Lu-170	Nb- 86
						I -119	Ba-130m	Pu-233	In-117m	Ce-137m
						Sb-117	Cu- 72	Eu-154	Tb-154ml	Tb-154m2
						Pm-152ml				
1009.9	1.1E-04	u Pa-234	B-	6.70	H	Pm-142	Es-249	Ho-172	In-129	Tc-105
						Fr-226	Sr- 99	In-106	Re-181	Si- 35
						Bi-195gm	Ba-143	Dy-151	Dy-149	
1011.8	--	u Bi-214	B-	19.9	M	Mo-101	La-142	Fe- 53m	Ru-109	Ir-194m2
						Pu-233	Mo-101			
1013.58	4.6E-03	t Ac-228	B-	6.15	H	Tl-199	Ge- 81	In-122	Sb-113	Rh- 97m

Energy 1013.8 ～ 1054.1 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Mg- 28				
1013.8	8.3E-03	u Bi-214	B-	19.9	M	Re-180	Pm-140	Pb-205m	Pm-148m	Cd-125
						Pm-138m	Er-150	Bi-201		
1014.64	0.017	a Pb-211	B-	36.1	M	Cd- 99	Mg- 27	Si- 27	Cu- 68m	Pa-238
						Re-168	Tb-145	W -177		
1015.2	1.5E-05	a Th-227	A	18.72	D	Ge- 79m	Pa-238			
1016.44	0.019	t Ac-228	B-	6.15	H	La-146	Br- 84	Ru- 93	Ru- 93m	Br- 84m
						Eu-142m	Rb- 84	Pm-135	Po-204	Pr-146
1017.92	5.7E-03	t Ac-228	B-	6.15	H	Pm-154	Sn-125m	Sb-130m	Ir-178	Te-113
1019.5	4.3E-05	u Pa-234	B-	6.70	H					
1019.86	0.021	t Ac-228	B-	6.15	H	In-123				
1020.	1.8E-05	a Th-227	A	18.72	D	Ar- 45	Ar- 46	In-117m		
1021.	0.014	u Bi-214	B-	19.9	M	Sb-117	Se- 83m	Cd-121m	Sn-123	Sb-117
						Zr- 97	Cr- 49			
1021.8	2.3E-04	u Pa-234	B-	6.70	H	La-145	Tl-206m	K - 43	C - 10	Cs-118gm
						Nb-100	Re-184			
1023.6	9.9E-05	u Pa-234	B-	6.70	H	Ho-170m	K - 42	Br- 74	Bi-199	Pr-148
						In-120m2	In-120m1	Ta-176	Sb-120m	Eu-142m
						Zr- 87	Te-121m			
1025.	=2.1E-06	a Fr-223	B-	21.8	M	Sr- 91	Nb- 98	Nb- 97	Tc-100	Re-168
1025.	1.5E-05	a Th-227	A	18.72	D	K - 44	Kr- 91	Ag-102	Cd-119m	Ga- 78
1025.3	8.2E-05	u Pa-234	B-	6.70	H	In-109m2	Np-238	Sn-109	Au-182	Sn-111
						Bi-200	Ag-119	Bi-200m1	Sb-133	
1028.7	9.1E-04	u Pa-234	B-	6.70	H	K - 50	Ho-154	Pb-203m2	Er-148	Fe- 61
						Cd-125m	At-208	Yb-177	I -130m	Pm-140m
						Bk-250	Cs-118gm	Ag-116m	Cd-117m	Pm-141
						Yb-165	Y - 85m	Sb-129	Cs-128	Sn-123
1032.37	0.078	u Bi-214	B-	19.9	M	Se- 83m	Ho-156	Cs-132	La-132	La-132m
						Bk-250	Te-115m	Es-250m	Rb- 89	Ti- 45
						Sc- 52	Tb-146m1			
1032.8	2.8E-05	u Pa-234	B-	6.70	H	Sb-111	Lu-168m	Mo- 91m	In-108	
1033.25	0.201	t Ac-228	B-	6.15	H					
1033.3	0.024	u Bi-214	B-	19.9	M	Rh- 94m	La-124gm	Bi-203	Po-199m	Eu-148
						Bi-199				
1035.9	4.1E-05	u Pa-234	B-	6.70	H	Ho-149m	Au-181	Os-183m	Sb-126m1	Br- 92
						Te-121m	Cs-122	Sr-102	Am-246m	Bk-246
						W -177	Tl-196m	Cd-102		
1037.9	2.8E-05	u Pa-234	B-	6.70	H	Yb-167	Rb- 96	Np-232	Sc- 48	Ce-138m
						Mn- 56	Br- 85	Co- 56	Rn-209	
1038.	8.3E-03	u Bi-214	B-	19.9	M	Cd-105				
1039.2	--	c Ge- 70	NN			Cs-134	I -135	Al- 29	Sn-109	S - 29
						Ga- 70	Ga- 66	Tc- 95m	Nb- 86	
1039.65	0.044	t Ac-228	B-	6.15	H	Y - 84m	Dy-149	Na- 29	Fe- 52	As- 70
						Cd-121				
1040.92	0.044	t Ac-228	B-	6.15	H	Tl-194	La-128	Sb-128m	Cu- 68m	In-121m
1041.7	5.1E-05	u Pa-234	B-	6.70	H	Gd-140	Sb-132m	Ne- 18	Gd-145	Ru-107
1041.7	1.2E-03	u Pa-234m	B-	1.17	M					
1044.4	=4.9E-05	u Pa-234	B-	6.70	H	Fr-228	Bi-205	Br- 82	Rb- 82m	Kr- 92
						Ir-184	Ba-129m	Cd-125m		
1045.6	0.026	u Bi-214	B-	19.9	M	Sb-124	Ho-151	V - 52	Ag-106m	Dy-148
						La-132m	Rh-102	Rh-102m	Ni- 57	Rh-106m
						Hg-188	Ir-196	Fr-212	Sr- 99	Ga- 65
1051.4	9.9E-05	u Pa-234	B-	6.70	H	Bi-196m2	Bi-196	Sc- 52	Lu-160gm	Tm-164m
						Tm-176	Cd-119	Te-129m	Ag-106	Lu-170
						In-118m1	Ru- 95	Ga- 72	In-118m2	Sb-118m
						La-145	Ar- 44	Pr-145		
1051.96	0.315	u Bi-214	B-	19.9	M	Cd-117	Sm-159	Ge- 69	Cd-123	I -133
1053.09	0.013	t Ac-228	B-	6.15	H	Bi-199	La-143	La-128	Si- 36	Ho-158m2
1054.11	0.018	t Ac-228	B-	6.15	H	Pd- 97	Se- 83m	Rh- 97	Ag-100	I -120m
						Tc- 90m				

Energy 1055. ～ 1106.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
1055.	6.5E-04	a Rn-219	A	3.96	S	In-129	Br- 72	Ru-111	In-128m	Te-116
						Cr- 57				
1057.8	=2.8E-05	u Pa-234	B-	6.70	H	Sm-143	In-108	Lu-183	O - 20	Nb- 88
						Sm-141	Tm-155	Pm-140	Au-190	Ta-168
						Dy-149	Ag-118m	P - 36		
1059.4	1.1E-03	u Pa-234m	B-	1.17	M	Eu-146	Fe- 49	Y -102m	Y -102	Pb-194
						Pm-136m	Pa-238	Fr-222	Os-181	Pa-238
1061.86	2.3E-03	u Pa-234m	B-	1.17	M	Rb- 90	Rb- 90m	Xe-123	Rb- 99	Lu-170
						Cs-116	Br- 72	Sb-126ml	Sb-109	Cs-141
						Bk-246	Am-246m	Dy-146		
1062.55	0.01	t Ac-228	B-	6.15	H	Ra-213m	Am-244m	Tm-152m	Ir-182	Bi-198ml
						Pb-207m	Bi-207	Nb-100		
1065.1	4.3E-05	u Pa-234	B-	6.70	H	V - 48	Xe-123	Y - 99	Cs-142	Te-116
						Pt-184m	Lu-174	Ga- 73	Tb-156	
1065.18	0.132	t Ac-228	B-	6.15	H	Eu-156	Ga- 63	In-119m	Cd-117m	Re-171
1067.2	0.027	u Bi-214	B-	19.9	M	Nb- 87	Dy-146	Cd-127	Pb-195	Sn-125
						Tb-162	Pb-195m	Eu-140	Rh- 94	
1069.96	0.275	u Bi-214	B-	19.9	M	Co- 63	Ne- 25	Tm-176	Gd-147	Re-176
1070.	2.5E-03	u Tl-210	B-	1.30	M	Au-189	Rb- 99	Cd-105	Te-115m	Lu-168m
1073.6	0.016	t Bi-212	B-	60.55	M	Hf-171	Gd-145	Sb-116m	Rb- 94	I -134
1073.6	1.6E-04	u Pa-234	B-	6.70	H	Gd-141	In-124m	Ac-232	Br- 82m	Ho-149
						Tl-194	Yb-165	Lu-164	Tc- 95	Nb- 88
1074.71	0.01	t Ac-228	B-	6.15	H	Nd-139	In-129	Pr-150	Ta-172	Se- 69
						Re-182	As- 82m	As- 82	La-143	Y - 86m
1078.62	0.564	t Bi-212	B-	60.55	M	Sb-116m	Al- 24	Rb- 86	Eu-147	Ga- 68
						Se- 73m	Cu- 68	Cu- 68m	Sb-109	Pm-135m
						Bi-195gm	Ar- 32	Ba-142	Tb-146ml	Bk-246
						Tb-148	Eu-156			
1080.16	0.012	a Pb-211	B-	36.1	M	Pm-152	Dy-165	As- 82m	As- 82	Cd-103
						Yb-177	Ne- 18	Cs-116	Br- 82m	Ge- 67
1083.2	8.9E-04	u Pa-234m	B-	1.17	M	Bi-197	Pr-138	Mo- 91m	Mo- 91	Nb- 88m
1083.2	8.1E-04	u Pa-234	B-	6.70	H	Nb- 88	Nb- 87	Pa-238	Ga- 80	Lu-168m
						Te-129	Am-244m			
1085.4	4.8E-04	u Pa-234m	B-	1.17	M	Cd-123	Po-200	Ba-127	In-127m	Am-246m
1085.4	4.3E-05	u Pa-234	B-	6.70	H	Ge- 77	Ta-172	I -114m	I -114	Ho-153
						Mo-103				
1088.18	5.9E-03	t Ac-228	B-	6.15	H	Lu-183	Au-198	Pd- 98	Sn-125	Ag-105
						Re-174	Tm-176	Sn-123	Pr-137	Sn-125
1090.5	2.6E-03	a Pb-211	B-	36.1	M	Rb- 94	Bi-197	Tb-148	In-128	Eu-152
						In-124	In-119m	Dy-155	Yb-165	Te-117
						Ba-139	Po-203	Y - 97ml	Cl- 39	I -114
						Tc- 96	Nb- 96	Au-196	In-118m2	Sb-118m
						In-122ml	Rb-101	Ge- 82	Sm-141	
1093.9	0.143	t Tl-208	B-	3.053	M	Pm-137	Pr-136	In-121	Fr-228	Sb-132
						Xe-123	Np-242m	Ag-101	Tm-172	I -118m
						Ba-142	In-127			
1095.68	0.129	t Ac-228	B-	6.15	H	Fr-230	Se- 71	As- 71	Sn-127	Co- 63
						Pm-154	Cd-121	Bi-195gm	Sb-133	Tc- 96m
						Ru- 95	Pr-137	Ru- 91	In-118	Pm-152ml
						Sb-116	Cu- 76gm	Gd-141m		
1103.41	0.015	t Ac-228	B-	6.15	H	Yb-153	Lu-170	Cd-119m	Os-183m	Te-121m
						In-121m	Ag- 99	Tc-102	Y - 97	Y - 97ml
						Rh-102	Ce-143	Tc-102m	At-209	
1103.52	4.6E-03	a Pb-211	B-	36.1	M					
1103.64	0.1	u Bi-214	B-	19.9	M	Sr-102	Np-242	Au-194	Tm-160m	
1104.79	0.077	u Bi-214	B-	19.9	M	Rh-116m	Os-183m	Ir-184	Am-244m	Tc-102
						Rh-102				
1106.9	1.3E-04	u Pa-234	B-	6.70	H	Lu-179	Y - 79	Ag-108	Ta-178	Mn- 48
						Tb-152m	Tm-152m	Lu-180	Ge- 69	Ar- 45
						Y - 96m	Eu-143	Te-121m	Eu-158	Tb-158

Energy 1109.4 ～ 1165. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Os-183m	Bi-201	Np-231		
1109.48	0.115	a Pb-211	B-	36.1	M	Ga- 76	Kr- 91	Cu- 70m	Eu-152	Tb-152
						Ta-172	Ga- 80	Rb- 78m		
1110.	1.5E-03	u Tl-210	B-	1.30	M					
1110.6	9.9E-05	u Pa-234	B-	6.70	H					
1110.61	0.304	t Ac-228	B-	6.15	H	Se- 73	Ce-145	Rh- 94	Re-178	Hg-195
						Tm-176	Ru- 93m	Bi-197	As- 85	Te-129
						Ir-187	Eu-152	Pm-152m1		
1115.55	--	c Cu- 65	NN			As- 70	Sn-127	Dy-151	Ar- 44	Sb-133
						Ni- 67	Lu-160gm	Ni- 65	Zn- 65	Ag-100m
						Pd-111m	Ge- 80			
1117.63	0.054	t Ac-228	B-	6.15	H	In-124m	Re-176	Nb- 97	Sn-129	Re-180
						Sb-134	Ge- 79m	Pb-197m	Tc-108	Nd-131
1118.9	0.04	u Bi-214	B-	19.9	M	Re-177	Kr- 90	Os-181m	Ta-170	Sn-109
1120.29	15.1	u Bi-214	B-	19.9	M	Yb-177	Zn- 71	Os-172	Pd-111	In-121m
1120.6	1.7E-03	u Pa-234m	B-	1.17	M	Sc- 46	Sc- 50			
1121.7	4.0E-04	u Pa-234	B-	6.70	H	Sb-115	Te-119	Ta-182	Re-182	Re-182m
						In-122m2	Sc- 40	Ho-156	I -130m	Cs-130
						Rh-114m	Nd-151	Bk-246	La-143	Tb-154
1125.2	5.8E-04	u Pa-234	B-	6.70	H	Sb-131	Zn- 63	I -135	Bk-246	Sr-101
						Y - 97m1	Br- 72	Au-202	Lu-183	Pr-134m
1125.7	1.8E-03	t Tl-208	B-	3.053	M	Te-131m	In-110m	Ag-110	Bi-195gm	K - 44
						Cl- 33				
1126.8	4.8E-04	u Pa-234	B-	6.70	H	Rn-211	Tc- 96	Nd-141	Nb- 89	Rh-106m
1126.8	4.0E-03	u Pa-234m	B-	1.17	M	Ag-106	Ag-106m	Rh-106	Sc- 52	Sn-129m
1130.29	0.04	u Bi-214	B-	19.9	M	Fr-230	Co- 62	Cu- 62	Co- 62m	Sn-107
						Nb- 90	Na- 26	Al- 26	Dy-151	Br- 76
						Cd-107	Co- 54m	Tm-163	In-123	Re-178
						In-123	La-124gm	I -135	In-124	In-124m
1133.66	0.248	u Bi-214	B-	19.9	M	Sm-135	Nb- 92m	Re-188	Y - 92	Cd-115m
						Ne- 25	Xe-135m	Es-250m	Te-135	Tb-144
						Lu-170	Ho-162			
1135.24	9.8E-03	t Ac-228	B-	6.15	H	Sc- 52	Pb-199	Am-240	Dy-149	Cs-132
						Br- 72	Te-119m	Lu-168m	Hg-205	Bi-199
						Np-242m				
1142.85	0.01	t Ac-228	B-	6.15	H	Hg-205	In-126m	In-126	Pr-150	Sn-131gm
						Ho-172	Dy-151	Sb-130m	La-146m	Ta-164
						Tl-190	Tb-144	Rh- 98m	Ca- 49	Br- 78
						Lu-170	Ge- 81			
1148.12	5.9E-03	t Ac-228	B-	6.15	H	Bi-199	Sb-113	Te-131	Ca- 47	Cs-141
						Nd-141	Cs-114	Sb-111	Pm-154	C - 18
						Rb- 78	Rb- 78m	Zr- 97	Mn- 51	Ce-145
						La-143	Nb- 97	In-109	Pt-187	
1151.4	5.1E-05	u Pa-234	B-	6.70	H	Yb-177	Tm-158	Mn- 60m	Pr-145	I -118
						Zn- 80	I -114	Cu- 76gm	Ta-174	Sb-134m
						C - 17	Tb-147	Al- 29	P - 29	
1153.5	7.3E-05	u Pa-234	B-	6.70	H	Sn-111	Co- 54	Bk-244	Y - 86	Y - 86m
1153.52	0.139	t Ac-228	B-	6.15	H	Cs-141	Eu-156	Fr-222	Mo- 89	Tb-156
						Sb-114				
1155.19	1.63	u Bi-214	B-	19.9	M	Fr-230	Tm-164	Ag-103		
1155.6	0.016	u Bi-214	B-	19.9	M	Dy-155	Sn-129m			
1156.	7.0E-03	u Bi-214	B-	19.9	M	Tc-110	Pb-197	Ge- 81		
1157.14	7.0E-03	t Ac-228	B-	6.15	H	Pt-187	K - 44	Sc- 44m	Sc- 44	Ag-121
						Ta-176	I -130	Sb-128m	Rh-102	Mo- 91m
1160.8	3.9E-03	t Tl-208	B-	3.053	M	Zr- 87	Tb-156	Lu-176m	Ta-176	Y -102m
						Au-189	Te-114	Mo-101	Dy-146	Sn-129m
						Y - 94	Sn-108	Hf-171	Fr-230	
1164.5	0.065	t Ac-228	B-	6.15	H	Os-183	Co- 62m	In-122m1	Co- 63	In-119m
						Rh- 98	Ba-129			
1165.	0.1	u Tl-206	B-	4.199	M	La-143	Tm-164	Eu-150m	Pm-150	Cd-123m

Energy 1167.3 ～ 1241.2 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
1167.3	0.012	u Bi-214	B-	19.9	M	Bi-197	Ce-131	Sb-132m	Tb-152m	Pm-134
						Es-250m	Ca- 51	Se- 87	Gd-163	Cs-134
						In-128	In-128m	Sn-128m	Nb- 98m	S - 37
1171.3	--	c Sn-119	NG			Na- 27	In-123m	At-209	Er-149m	La-130
1171.3	--	c Sn-120	NN			Sb-120	In-120m1	In-120m2	Cs-141	Sb-120m
1171.3	1.4E-04	u Pa-234	B-	6.70	H	Pd- 97				
1172.98	0.051	u Bi-214	B-	19.9	M	Hg-195	In-120	Co- 62m	Co- 62	Sb-118
1173.1	7.3E-05	u Pa-234	B-	6.70	H	Cd-125m	Sm-143	Co- 60	In-118	Bi-195gm
1174.2	1.9E-03	u Pa-234m	B-	1.17	M	Re-184m	Ta-166	Ag-101	Sr- 76	Fr-228
1175.31	0.024	t Ac-228	B-	6.15	H	Y - 98m	Po-201	Au-194	Kr- 87	Tb-149
						Es-250m	Y - 82	Cs-142	Cd- 98	Cl- 34m
						Tm-166	Te-119	Sn-123	Er-150	Rn-208
1182.1	=1.5E-05	u Pa-234	B-	6.70	H	Br- 82m	Cu- 69	Xe-125	Nd-151	Te-113
						At-210	Ge- 79	Cd-121m	Sb-128	Ag-103
						Ta-178	Nd-131	Ir-194		
1185.2	6.1E-03	t Tl-208	B-	3.053	M	Te-135	K - 35	Rh- 97m	Eu-158	Pr-154
						Cs-118gm	Lu-169	Lu-168	Cu- 61	Y - 80
						Cd-119m	Fr-212	In-120	Sn-107	Eu-158
						Tm-160m	Ag-110	Ga- 78	Po-201	Eu-158
1190.81	6.2E-03	t Ac-228	B-	6.15	H	Cu- 59	Re-182	Ta-182	Re-182m	Au-187
						Ta-176	In-122m1	Sr-102	Xe-135m	
1193.77	3.3E-05	u Pa-234	B-	6.70	H	Ir-181	Gd-141	Ge- 83	Np-234	Pm-150
1193.77	0.013	u Pa-234m	B-	1.17	M	Cs-141	Ru- 93	Ag-106	Rh-106	Rb- 81m
						Er-151				
1196.33	0.01	a Pb-211	B-	36.1	M	Ho-162	Pb-192	Ag-121	Ba-143	Tc- 94m
						Sn-129	Rb- 75	Zn- 73	Ba-141	Pm-140m
						Lu-180	Rn-210	Sr- 99		
1206.4	--	u Bi-214	B-	19.9	M	Y - 91	Nb- 91m	Lu-176m	Pm-140	Tm-163
						Ag-101	Ag-100m	Tl-200	Ta-174	Te-131m
						Os-181m				
1207.68	0.451	u Bi-214	B-	19.9	M	As- 80	Po-201	Ge- 69	Sb-131	In-120
						Mo- 91m	Ta-173			
1210.	3.5E-03	u Tl-210	B-	1.30	M	Os-176	Ag-114	Ir-188	Zr- 87	Nd-155
						Y -102	Y -102m	Ho-157	La-134	Sr-101
						Bi-204	Zn- 79			
1217.03	0.021	t Ac-228	B-	6.15	H	Sn-104	Ba-139	Au-181	As- 76	Br- 76
						Ba-124	Lu-178			
1217.3	3.5E-04	u Pa-234	B-	6.70	H	Br- 86	Dy-147m	I -137	Lu-170	Es-249
						Hg-205				
1220.37	9.0E-04	u Pa-234m	B-	1.17	M	Ba-139	Tb-165	Gd-143m	Ar- 35	Ru- 92
						Lu-168m	Ho-162m	I -137		
1220.4	9.9E-05	u Pa-234	B-	6.70	H	Y - 85m	Tm-156	In-130m2	In-130	Re-182
						Re-182m	In-129m			
1226.7	< 0.018	u Bi-214	B-	19.9	M	Ta-176	Au-200	Tl-200	Ta-175	Lu-170
						Sn-131gm	Rn-208	Ho-170m	Cs-141	Lu-176m
						Ho-152	Zr- 87	Xe-142	K - 42	Sc- 42m
1229.4	7.5E-03	t Ac-228	B-	6.15	H	Yb-153	Cs-118gm	Ta-174	As- 76	Ir-196
						Rh- 97	Sn-131gm	Sb-118		
1229.68	--	c Sn-117	NG			In-118m1	In-118m2	Sb-118m	In-118	Ge- 65
1229.68	--	c Sn-118	NN							
1230.6	0.015	u Bi-214	B-	19.9	M	Rh- 96	Eu-156	Re-182	Ta-182	Tm-164m
1234.3	1.3E-03	a Pb-211	B-	36.1	M	Er-149	Br- 90	Lu-168	Lu-168m	Gd-142
						Sr- 77	Sb-113	Cd-117m	Tb-165	K - 46
						Cd-127	Nb-102m	Cs-136	Pb-190	Ga- 80
1237.24	<1.5E-05	u Pa-234	B-	6.70	H	O - 19	I -133	Ti- 45	Sb-115	Rh-104
1237.24	5.3E-03	u Pa-234m	B-	1.17	M	Rh-104m	Np-234			
1238.11	5.79	u Bi-214	B-	19.9	M	Bi-192gm	Rh-104			
1238.28	--	c Fe- 56	NN			Mn- 56	Co- 56	Cr- 59	Ag-104m	Po-205
						Sn-132				
1241.2	3.6E-04	u Pa-234	B-	6.70	H	As- 78	Cd-123m	Cd-127	Hg-195m	Yb-177

Energy 1245.0 ～ 1330. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Tb-165	Lu-174	Tm-174	Po-203	Eu-156
						Na- 33	Rb- 90m	Sm-143	Sm-142	
1245.05	0.095	t Ac-228	B-	6.15	H	Sb-110	Ac-230	Y - 97ml	As- 84	Zr-102
1247.08	0.5	t Ac-228	B-	6.15	H	Mn- 52	Au-181	I -136	Eu-150	Dy-148
1247.8	3.5E-05	u Pa-234	B-	6.70	H	Lu-176m	Mn- 52	B - 14	Rb- 89	Po-199m
						Ho-154m				
1250.04	0.062	t Ac-228	B-	6.15	H	Tm-160m	Br- 74m	In-119m	Ta-175	Tm-162
						In-120	Mo-101			
1252.6	2.8E-05	u Pa-234	B-	6.70	H	Cu- 72	Cu- 70m	Cu- 69	Bi-197	Sn-129
						In-116				
1253.14	--	u Bi-214	B-	19.9	M	Ta-176	In-112	Ba-139	Lu-178	
1256.5	9.4E-05	u Pa-234	B-	6.70	H	Y - 84m	Pt-187	P - 36	Ge- 80	Br- 80
						Lu-166m2	Te-113	Ba-139	Ge- 83	I -122
						I -118	Sb-112	Rb- 80	Ag-102	Lu-170
						I -118m	Sr- 97			
1270.71	6.8E-03	a Pb-211	B-	36.1	M	Br- 74	Br- 74m	Lu-178	Sr- 93	Pt-187
						Ag-118	As- 74	Tm-160	Tm-159	Nb- 90
						Cd-121m	Tb-160	Ru-107	Mo- 89	
1274.53	99.94	c Na- 22	EC	2.6088	Y	Ga- 81	Xe-137	Al- 29	P - 29	Au-200
						Tm-166	Ag-103	Ar- 35	Pb-204m	Sm-140
						Dy-149	Eu-154	Tb-154	F - 22	Cd-105
						Re-184	Ta-164			
1276.69	0.014	t Ac-228	B-	6.15	H	Rh- 96	Ga- 64	Ho-153	Dy-148	Er-149m
1277.7	7.1E-05	u Pa-234	B-	6.70	H	Sr- 95	Eu-156	I -138	Y - 80	Nb- 89m
1279.	0.012	u Bi-214	B-	19.9	M	Tb-164	Mg- 22	Sb-134	Sb-134m	Pm-138m
						Hg-189gm	Sb-115			
1280.96	1.43	u Bi-214	B-	19.9	M	Cs-142	Lu-170	Nb-100m	Sr- 91	Ho-148ml
1282.8	0.019	t Tl-208	B-	3.053	M	Cd-123m	Mn- 50m	Te-112	Pd-111m	Cd-127
						Lu-169				
1284.	0.011	u Bi-214	B-	19.9	M	Lu-166ml	Pa-236	Gd-143		
1285.1	0.017	u Bi-214	B-	19.9	M	Pm-137				
1286.27	0.05	t Ac-228	B-	6.15	H	Br- 86	Tm-156	Ga- 81		
1287.68	0.08	t Ac-228	B-	6.15	H	Eu-142	Sb-117	Cd-103	Tb-165	Fe- 53
						Ca- 49	In-129m	Pb-197	Pd-101	V - 53
1292.8	7.4E-04	u Pa-234	B-	6.70	H	Os-176	Y - 97	Tb-154	Tc- 90m	Fe- 59
						Tb-165	Rb- 94	Sm-141	Nd-141	Cu- 68
1293.56	--	c Sn-115	NG			In-116	In-116ml	Sb-116	Sb-116m	Ar- 41
1293.56	--	c Sn-116	NN			Sc- 51	As- 80	Ag- 97	La-144	In-122m2
						In-120ml	Lu-170			
1296.4	4.6E-05	u Pa-234	B-	6.70	H	Tm-164	Eu-146	Ca- 47	Cs-132	I -133
1301.2	2.8E-05	u Pa-234	B-	6.70	H	In-108	Lu-180	In-114	Sb-114	Kr- 77
						Pr-147	Ho-154	Eu-160	Sm-155	Ag-114
						S - 39	Cd-105			
1303.76	0.112	u Bi-214	B-	19.9	M	I -137	I -117	Sb-118m	Cd-117	Cs-128
						Mo-101	Pb-195	Ag-116	Se- 87	Bi-197
						Ru-109	Bi-199			
1309.71	0.019	t Ac-228	B-	6.15	H	Cs-139	Br- 78	As- 78	Mo-107	Xe-140
						Pt-181	O - 20	Lu-178	Ta-178	Rh- 97
						Al- 30	Ba-139	Zn- 61	Os-179	Gd-163
1315.34	0.015	t Ac-228	B-	6.15	H	Ho-152	Bi-197	Eu-152ml	In-124	Ca- 51
						Cd-121	K - 48			
1316.	4.4E-03	u Tl-210	B-	1.30	M	Cd- 99	Zn- 75			
1316.96	0.08	u Bi-214	B-	19.9	M	Co- 55	Br- 72	Cd-119	Rh- 95	As- 84
1317.7	--	u Bi-214	B-	19.9	M	Rb- 82m	Br- 82m	Br- 82	Cs-132	Au-181
						Tm-162	Au-187	Ho-162		
1327.	2.8E-05	u Pa-234	B-	6.70	H	Tm-164	Bi-201	I -124	Sb-124	Sn-134
						Te-115				
1327.03	--	c Cu- 63	NN			Zn- 63	Co- 53	Fe- 53m	Tc- 91m	
1330.	0.011	u Bi-214	B-	19.9	M	Se- 69	Os-179	Ta-172	As- 83	Os-178
						Rh-114m	Cd-123	Sr- 96	Hg-207	Au-187

Energy 1337.3 ～ 1407.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
1337.33	4.9E-03	t Ac-228	B-	6.15	H	Pd- 99	Cr- 57	Cs-124	Lu-164	Rb- 96
						Y - 83	Ge- 69	Os-177	Cu- 76gm	Sn-123
						Sc- 43	Po-203	Kr- 87	Cd-105	Te-119
						Br- 78				
1341.49	0.022	u Bi-214	B-	19.9	M	Cu- 59	Cu- 68m	Fr-224	Lu-178	Ta-178
						Ta-176	Rh-100	Rh-104m	Rh-104	Ag-104m
						Sm-143	Eu-142m	Si- 26		
1342.9	2.0E-05	u Pa-234	B-	6.70	H	Mg- 28	Dy-146	Ir-197gm	Sb-109	
1344.59	9.0E-03	t Ac-228	B-	6.15	H	Eu-150	Cd-119m	Ta-170	K - 46	Sm-142
						Pm-141	Cu- 64	I -120m	Zr-103	
1347.5	0.015	t Ac-228	B-	6.15	H	Co- 64	Kr- 75	K - 46	Ir-181	Pr-139
						Tl-195	Sn-127m	Pr-138m	Ga- 82	In-129
1351.	--	u Bi-214	B-	19.9	M	Ta-178	Te-115m	Pd- 95m	Br- 89	
1352.9	1.8E-03	u Pa-234	B-	6.70	H	Rh- 95	Sb-134	Tm-162	Dy-146	
1353.	6.2E-04	u Pa-234m	B-	1.17	M					
1353.4	--	u Bi-214	B-	19.9	M	Mn- 51				
1354.6	2.1E-04	u Pa-234	B-	6.70	H	Ga- 82	La-141	Ga- 65		
1357.78	0.02	t Ac-228	B-	6.15	H	In-116	O - 19	Ne- 19	Pr-148	Zn- 77
						Xe-135m	Pm-154m	Au-183		
1359.	2.5E-04	u Pa-234	B-	6.70	H	Lu-166m2	Au-187	Rb- 98m	Pr-136	Cd-102
1361.2	--	u Bi-214	B-	19.9	M	Co- 56	Br- 87	Cd-105	Kr- 92	Ta-174
						Br- 86	Tc-102	Tc- 91m	Tc- 91	Tc-100
						Rh-102	Br- 90	In-125	Au-181	Zr- 97
						Tl-200	Rn-211	Tc- 93	Mo- 93m	Nb- 86
1365.7	0.014	t Ac-228	B-	6.15	H	Pr-152	Tl-195	Lu-168m	Mn- 48	Cd-119m
						Co- 63	Lu-170	Tm-164m	Cs-134	Tc-105
1371.9	--	c Pb-204	NG			Co- 55	Ba-139	Ca- 37	Ho-168	Au-181
						Mg- 28				
1374.19	0.014	t Ac-228	B-	6.15	H	As- 78	C - 17	Tm-166	Tm-163	Ag-119
						Ho-149	Rb- 90m	Ac-230	Pr-139	
1377.67	4.	u Bi-214	B-	19.9	M	I -124	Pr-144	Pr-146	Tm-175	Cd-100
						Tb-164				
1378.23	5.9E-03	t Ac-228	B-	6.15	H	In-126m	Fr-224	I -126	Rn-208	Lu-169
						Na- 25				
1381.1	2.5E-03	t Tl-208	B-	3.053	M	Br- 89	Er-149m	I -130m	Ba-142	Rh-100m
						Te-115	Ho-153	Ir-181	Tc- 93	Pr-148
						Cd-121m	La-146	Y - 88	Pm-156	In-123
						Pb-199				
1385.31	0.757	u Bi-214	B-	19.9	M	S - 29	Sr- 92	Pm-134m	Mg- 21	Ag-110m
						Eu-160	Cs-122	Rb- 93		
1385.39	0.011	t Ac-228	B-	6.15	H					
1387.5	--	u Bi-214	B-	19.9	M	In-105	Tm-172	Sr- 93	Ga- 64	Lu-168
						Tb-145	Dy-147m	Re-168	Bi-197	Ac-232
						Cd-105	Pd-111			
1389.6	1.2E-04	u Pa-234	B-	6.70	H	Dy-146	Eu-152m1	In-122	Br- 86	Dy-149
						Pr-226				
1392.5	0.019	u Bi-214	B-	19.9	M	Tb-165	Np-234	Au-204	Zn- 63	
1392.7	3.4E-03	u Pa-234m	B-	1.17	M	Au-181				
1393.9	3.3E-03	u Pa-234	B-	6.70	H	Sm-140	Pm-154	Ca- 51	Hg-181	K - 43
						Y - 80	Tm-160	F - 21	Rb- 82	Cu- 59
						Lu-170				
1397.5	1.3E-04	u Pa-234	B-	6.70	H	Sn-107	Ru- 93m	Tb-165	Ge- 79	Pm-144
						Tm-163	Fe- 53	Tm-172	Mg- 29	I -132
						Lu-162				
1400.3	2.8E-04	u Pa-234	B-	6.70	H	Se- 86	Tb-142	Y - 97	Zr- 87	Tm-150
1401.49	0.012	t Ac-228	B-	6.15	H					
1401.5	1.27	u Bi-214	B-	19.9	M	Cr- 55	Ir-196	I -116	Rb- 96	Ta-178
						In-121m	Sm-143	Pm-141		
1407.98	2.15	u Bi-214	B-	19.9	M	As- 81	Co- 54m	Sn-104	Pt-181	Ti- 43
						Ag-116	Ti- 45	Au-187	Ta-168	Co- 55

Energy 1409.1 ～ 1501.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
1409.1	7.1E-05	u Pa-234	B-	6.70	H	Ca- 49	Cr- 57	Re-180		
1410.	1.0E-03	u Tl-210	B-	1.30	M	Zr- 85	Ru- 95	Tl-197	Na- 26	Eu-152m1
1413.88	2.3E-03	u Pa-234m	B-	1.17	M	Zn- 63	Gd-142	As- 70	I -139	Ho-150m
						As- 68	Sr- 91	Lu-168	Xe-140	Rh- 98m
1414.4	<4.3E-06	u Pa-234	B-	6.70	H	Au-204	Rh- 98	I -118		
1415.66	0.021	t Ac-228	B-	6.15	H	Ge- 83	Tc-110	Ag- 96		
1415.8	0.481	u Bi-214	B-	19.9	M	Fe- 52m	Cd-105	Tc-108	Cd-101	Tb-146m1
1419.7	5.1E-03	u Bi-214	B-	19.9	M	Mo- 93m	Ge- 79	Nb- 98	Sn-125	Br- 87
						I -126	Eu-140	Ba-139	Tl-198	Cs-139
						Lu-168m	Tb-156			
1426.9	2.6E-04	u Pa-234	B-	6.70	H	Au-183	Y - 93	I -139	Hg-183	Lu-166m2
						Se- 85	Ag- 98	Re-182	In-109m2	Sr- 94
						Os-181m	Lu-170			
1430.95	0.035	t Ac-228	B-	6.15	H	Ge- 81	Cu- 69	Mg- 29	Tc- 91m	Rh- 94m
						La-144	Si- 33	Nb- 98m	Te-114	Nb- 98
1434.13	9.7E-03	u Pa-234m	B-	1.17	M	Cu- 68	Cd-117m	Pm-156	Si- 26	Au-187
						Bi-197	V - 52	Mn- 52m	Mn- 52	
1434.22	8.0E-03	t Ac-228	B-	6.15	H	I -128	Tm-163	K - 45	Nd-141	Ge- 83
1435.8	66.4	La-138	EC	1.05E+11	Y	Np-234	Tl-198	Fr-224	Cs-138	Cs-138m
						At-210	Dy-147m			
1438.01	5.9E-03	t Ac-228	B-	6.15	H	Sc- 51	Pr-137	V - 48	Pm-152m1	Cd-123
						Rb- 95	Ar- 43	Tb-165	Pm-154m	Pm-154m
1442.8	4.9E-05	u Pa-234	B-	6.70	H	Ag-108	Au-190	Bi-207	Mn- 50m	Ga- 74
						Tb-164	O - 19	Ne- 19		
1445.4	5.1E-04	u Pa-234	B-	6.70	H	Br- 92	Sb-117	Pr-152	Mn- 58m	Tb-145
						Tl-198	Mo- 91			
1451.4	0.011	t Ac-228	B-	6.15	H	Bi-196	Lu-169	Lu-170	O - 21	Y - 93
						Pr-146	Rh- 96m			
1452.7	1.3E-03	u Pa-234	B-	6.70	H	Au-187	Ho-152	I -120m	Tb-150	Pm-148
						Te-117	Cu- 58			
1458.5	1.8E-03	u Pa-234m	B-	1.17	M	Pm-154m	Mn- 62	I -135	Eu-143	
1458.9	1.5E-04	u Pa-234	B-	6.70	H	Pd-111				
1459.14	0.83	t Ac-228	B-	6.15	H	Ba-129m	Ru- 95	Ar- 44	Lu-166	Lu-170
1460.83	10.67	K - 40	EC	1.277E+9	Y	Pb-195	Tm-160	Dy-147m	Cl- 40	Ag-102m
						Br- 84m				
1469.71	0.02	t Ac-228	B-	6.15	H	Os-181m	Er-149m	Nb-104gm	In-112	Ir-196
						Ir-194	Tm-163	Pr-152	Ce-131	Re-170
						Tm-172				
1470.9	9.2E-03	u Bi-214	B-	19.9	M	Cd- 99	Lu-162	Pr-146	In-124	In-106
						Sc- 50	Cl- 33	Kr- 89	Ge- 67	
1475.8	1.3E-05	u Pa-234	B-	6.70	H	Ar- 35	Br- 82	Br- 82m	Rb- 82	Rb- 82m
						La-143	Dy-151	In-110m	Ag-110	As- 72
						Sb-126m1	Cd-103	Mo- 93m	Tc- 93	
1479.15	0.051	u Bi-214	B-	19.9	M	Lu-166m2	Ga- 78			
1480.37	0.016	t Ac-228	B-	6.15	H	Ca- 51	Sb-118m			
1481.84	--	c Cu- 65	NN			Sn-131gm	Fe- 59	Ni- 65	Sb-110	Na- 30
						Ni- 69	Cd-121	At-210	Tb-144	La-134
1485.4	4.8E-05	u Pa-234	B-	6.70	H	Sn-125m	Ho-158m2	Ca- 51	In-108	
1488.	2.1E-05	u Pa-234	B-	6.70	H	Na- 27	Cd-121m	Cu- 58	Sn-109	
1490.	4.2E-04	u Tl-210	B-	1.30	M	Pr-144	Rh- 95	Pm-140	Sm-141m	Er-150
1493.6	1.6E-04	u Pa-234	B-	6.70	H	Tc- 93m	Cr- 57	Te-114	Pd- 97	Fe- 63
						Rh- 95				
1495.91	0.86	t Ac-228	B-	6.15	H	Se- 88	Cs-122	Ho-149	Ge- 81	Sm-141
						Tl-196				
1496.	5.8E-05	u Pa-234	B-	6.70	H	Ta-178	Lu-178	Tm-151m	Np-240m	La-136
						In-116	Tc- 96m	Se- 87		
1500.	1.8E-05	u Pa-234	B-	6.70	H	La-146	K - 44	Sc- 44	Sb-112	I -122
						Ho-148m1	Ce-133			
1501.	=1.3E-03	u Pa-234m	B-	1.17	M					
1501.57	0.46	t Ac-228	B-	6.15	H	Kr- 91	Nb-100	Pb-199	Ru-109	Te-112

Energy 1507.3 ～ 1620.5 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
1507.3	3.1E-05	u Pa-234	B-	6.70	H	Na- 30	Kr- 93	Ge- 79	Bi-199	Bi-203
						Rb- 96	In-119m	Zr- 89m	In-112	In-116m1
						Mo- 91m				
1509.23	2.11	u Bi-214	B-	19.9	M	Cr- 49	Tc- 94	I -124	Tc- 92	
1510.1	<1.5E-05	u Pa-234	B-	6.70	H					
1510.2	0.013	u Pa-234m	B-	1.17	M	Pr-138	Ag-121	Tc-105	Au-204	Tm-151m
1512.7	0.288	t Bi-212	B-	60.55	M	Tl-195	Cd-123m	La-141	I -137	Tc-100
1515.5	6.9E-03	u Bi-214	B-	19.9	M	Cr- 49	Lu-180	Tl-200	Sm-143	Pr-136
1515.6	1.2E-04	u Pa-234	B-	6.70	H	Nb- 97	Ru-111	Pm-156	Ba-147	Cl- 39
1520.7	=1.5E-05	u Pa-234	B-	6.70	H	Ca- 50	Pb-194	Tc- 93	Dy-149	Tc- 94m
1527.27	2.4E-03	u Pa-234m	B-	1.17	M	Ge- 83	La-130	Tm-160	Rh-104m	Ag-104
						Np-234	Ag-106m	Cr- 55		
1529.05	0.057	t Ac-228	B-	6.15	H	Ir-181	Rh-106m	In-108m	Tm-172	Cu- 68m
						Kr- 88	As- 78	Kr- 89	Sm-140	V - 52
						Fe- 52	Er-149m			
1532.8	--	u Bi-214	B-	19.9	M	Ho-149m	Lu-152	Ag- 99	Au-183	Mo-101
						Eu-146	Al- 30	I -137	Tc- 91m	Lu-170
1537.89	0.047	t Ac-228	B-	6.15	H	Bi-203	Au-183	Ru-109	Eu-143	K - 48
						Rb- 89	Dy-151			
1538.5	0.376	u Bi-214	B-	19.9	M	In-112	Bi-201			
1538.8	2.1E-05	u Pa-234	B-	6.70	H	Tc- 93	Rn-211			
1540.	4.2E-04	u Tl-210	B-	1.30	M	Rh- 94	Ag-108	Cu- 72	Cu- 68m	As- 82m
1543.32	0.2	u Bi-214	B-	19.9	M	Sn-107	Sn-111	Fe- 63		
1543.9	--	c Pb-204	NG			Nb- 88	Ta-172	Sm-143	La-142	
1548.65	0.038	t Ac-228	B-	6.15	H	Zn- 63	Cl- 32	Ga- 81	Tm-151m	Er-151
1550.	1.8E-03	u Pa-234m	B-	1.17	M	Ho-151	V - 47	Sb-116		
1550.1	1.2E-04	u Pa-234	B-	6.70	H	Te-113	Dy-147m	Pr-138	La-136	Ba-136m
1553.74	8.1E-03	u Pa-234m	B-	1.17	M	Cd-103	Pm-142	Er-149m	Au-204	Tl-196
1553.77	83.	V - 50	EC	1.4E+17	Y	Sc- 50m	Sc- 50	O - 19	Ne- 19	La-134
1557.11	0.178	t Ac-228	B-	6.15	H	Sb-113	La-143	Xe-141	Pr-148m	Cd-103
1558.4	7.5E-04	u Pa-234m	B-	1.17	M	Cd-105	In-125	Np-234	Sc- 43	Tl-190
1559.85	0.02	t Ac-228	B-	6.15	H	Ir-183	Pa-236	Tc-105	Er-149m	Re-179
						Ni- 56				
1567.	1.8E-05	u Pa-234	B-	6.70	H	Te-117	Pt-179	Ir-181	Ba-127	Sb-112
						Sc- 51	Ca- 38	I -114	Re-170	
1570.67	1.1E-03	u Pa-234m	B-	1.17	M	Au-200	Cr- 49	Cd-103	Np-234	In-126
1571.52	5.7E-03	t Ac-228	B-	6.15	H	Br- 72	In-124	P - 35		
1573.26	0.033	t Ac-228	B-	6.15	H	Fr-228	Cl- 34m	Sm-143m2	Sn-109	
1579.9	1.2E-04	u Pa-234	B-	6.70	H	Er-149	Sb-117	Tm-150	Tb-146m1	Pr-134
1580.53	0.6	t Ac-228	B-	6.15	H	Nb- 89	Mo- 91	Ag-102		
1583.22	0.69	u Bi-214	B-	19.9	M	Ho-166	Ge- 81	Cd-105	P - 37	Cd- 99
						Ho-149	Ta-176	Cd-121		
1585.9	2.3E-04	u Pa-234	B-	6.70	H	Ag- 98	Cd-125	Ta-175	Ti- 42	Rh- 97m
1588.2	3.22	t Ac-228	B-	6.15	H	I -114	Nb- 86	Ag-100m	Pa-228	
1590.	4.2E-04	u Tl-210	B-	1.30	M	Cd-125m	Mg- 28	Y - 98m	Ca- 50	Y - 98
1592.5D	--	t Tl-208	B-	3.052	M	Tc- 94	Au-183	Ac-232	Dy-151	
1593.88	2.7E-03	u Pa-234m	B-	1.17	M					
1594.	4.9E-04	u Pa-234	B-	6.70	H					
1594.73	0.25	u Bi-214	B-	19.9	M					
1595.	5.0E-03	u Bi-214	B-	19.9	M	Eu-141m	Pr-140	La-140		
1598.	6.0E-03	u Bi-214	B-	19.9	M	La-145	Pr-139	Ga- 72	Tc-104	Lu-183
						In-127	Cs-146			
1599.31	0.23	u Bi-214	B-	19.9	M	At-210	Te-115	Gd-145		
1601.8	4.7E-04	u Pa-234m	B-	1.17	M	Pd- 95m	Sm-141	In-108m	Lu-165	Kr- 75
						Er-149m	As- 74	Pr-136	Pm-139	
1609.41	7.7E-03	t Ac-228	B-	6.15	H	Si- 34	Tb-147m	Nd-141	Tm-172	Ag-117
						Cd-119	Re-188	Sn-111	Ba-129	Tm-164
1618.3	1.5E-05	u Pa-234	B-	6.70	H	Ir-186m	Y - 95			
1620.5	1.49	t Bi-212	B-	60.55	M	C - 18	Fe- 53	Mg- 28	Tc- 95m	Cs-139
						Tl-196	Si- 26	In-109		

Energy 1625.0 ～ 1732.2 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
1625.06	0.255	t Ac-228	B-	6.15	H	Ni- 65	Ba-129m	Ga- 79	Pm-154m	Sc- 51
1627.3	1.2E-04	u Pa-234	B-	6.70	H	Mg- 31	Nb- 89	Dy-149	Tb-147	Tb-147
1630.63	1.51	t Ac-228	B-	6.15	H	Cs-128	Eu-150m	Rb- 78m	Pr-139	Ir-183
						Pr-144m	Zn- 71			
1636.3	0.012	u Bi-214	B-	19.9	M	Cs-140	In-122	O - 14	Cd-105	Ne- 23
						Ca- 52	In-126m	Am-238		
1637.	6.0E-03	u Bi-214	B-	19.9	M	Hg-207	Mo- 91			
1638.1	3.3E-04	u Pa-234	B-	6.70	H	Na- 29				
1638.28	0.47	t Ac-228	B-	6.15	H	P - 36	Pd- 97	Ar- 45	Ga- 76	
1640.5	1.6E-05	u Pa-234	B-	6.70	H	Ir-181	Tc- 91	Mo- 89	Tb-149	Ac-232
1644.	--	u Bi-214	B-	19.9	M	Cl- 38	Tb-147m	Sb-114	Cd-105	Br- 88
1644.9	1.6E-05	u Pa-234	B-	6.70	H	O - 20	Se- 88	Rb- 78m	As- 80	Fe- 61
1647.5	7.1E-04	t Tl-208	B-	3.053	M	Ir-181	Ir-186	Cd-121	Tm-161	
1650.	4.2E-04	u Tl-210	B-	1.30	M	Er-149m				
1650.2	<8.2E-06	u Pa-234	B-	6.70	H	Bi-201	N - 18			
1655.7	4.1E-05	u Pa-234	B-	6.70	H	Sb-134	In-131m1	In-131	Si- 26	Te-115m
1657.	0.046	u Bi-214	B-	19.9	M	Cs-146	Zr- 89	Te-112	Cu- 72	Eu-142
						Pb-199	Eu-145	P - 28		
1661.28	1.15	u Bi-214	B-	19.9	M	Fe- 61	I -114m	Se- 83m	Eu-144	Ag-114
						Sn-130m	Ti- 45	I -139	Ho-166	
1664.8	2.8E-05	u Pa-234	B-	6.70	H	Ho-149	Zn- 77	Tb-165		
1665.8	8.3E-03	u Bi-214	B-	19.9	M	Rb- 90m	Cd-105			
1666.52	0.178	t Ac-228	B-	6.15	H	La-136				
1667.6	8.2E-04	u Pa-234m	B-	1.17	M					
1668.4	1.2E-03	u Pa-234	B-	6.70	H	Pt-181	Ir-185	Cd-119m	K - 46	
1671.64	4.1E-03	t Ac-228	B-	6.15	H	Y - 94				
1672.8	5.4E-05	u Pa-234	B-	6.70	H	I -138	Ag-110	Tm-164	Mn- 58	Co- 58
1677.67	0.054	t Ac-228	B-	6.15	H	Cu- 68	Tc-104	Ar- 41	Ho-148	Ho-148m1
						Cs-126				
1679.5	1.2E-04	u Pa-234	B-	6.70	H	Lu-178	Bi-203			
1679.7	0.058	t Bi-212	B-	60.55	M	Ru- 92	Re-179	Rb- 76	Ga- 80	Pt-181
						Tb-149m				
1683.99	0.216	u Bi-214	B-	19.9	M	Ba-139	Te-133m	In-112	Nb- 87	
1684.01	0.015	t Ac-228	B-	6.15	H	Cs-128	Gd-163			
1685.7	4.9E-04	u Pa-234	B-	6.70	H	Sr-101	Ag-100			
1686.09	0.095	t Ac-228	B-	6.15	H	Cd-127	Lu-168	Ho-171	Cs-130	
1693.4	--	u Bi-214	B-	19.9	M	Ga- 63	Rh- 96m	S - 38	Rb- 98	La-141
1693.8	1.1E-03	u Pa-234	B-	6.70	H	Kr- 89	Ag-100m			
1694.1	4.5E-04	u Pa-234m	B-	1.17	M	Ce-131				
1695.	4.3E-04	u Pa-234	B-	6.70	H	Cd-123	Al- 31	Nd-155	Dy-146	Nb- 99m
						Ta-176	Tl-196			
1700.5	1.6E-04	u Pa-234	B-	6.70	H	Cd-121	Pt-181	Sr- 93	Sb-118	
1700.59	0.01	t Ac-228	B-	6.15	H	Ne- 18	Cd-125	F - 23	Nb- 98m	
1702.43	0.048	t Ac-228	B-	6.15	H	Dy-151	Cd-119m	Rb- 82	Ar- 44	Au-204
1706.19	8.5E-03	t Ac-228	B-	6.15	H	Pm-139	Sm-143m2	K - 45	Tl-195	I -135
						Cs-130	La-143	As- 70		
1711.	1.8E-03	u Bi-214	B-	19.9	M	Sb-112	Fr-230	Ni- 69		
1713.47	5.4E-03	t Ac-228	B-	6.15	H	Rb- 92	Fe- 53m	Zr- 89	Ho-149	Ga- 81
						Ca- 51	Br- 74m	In-106m		
1717.	--	u Bi-214	B-	19.9	M	Ir-188	Mg- 21	Tm-152m	In-106m	Te-117
						Te-133				
1719.7	2.8E-05	u Pa-234	B-	6.70	H	Co- 62m	Bi-206	Tb-144	Si- 27	Bi-203
1720.5	3.2E-04	u Pa-234m	B-	1.17	M	Br- 78	Ag-104m			
1721.4	5.7E-03	t Ac-228	B-	6.15	H	Ta-176				
1723.2	2.5E-05	u Pa-234	B-	6.70	H	Cd-101	Cd-117	Au-192		
1723.7	--	u Bi-214	B-	19.9	M	Rh- 98				
1724.21	0.029	t Ac-228	B-	6.15	H	Cd-105	Dy-147m	Ni- 65		
1727.8	3.1E-05	u Pa-234	B-	6.70	H	Br- 85	V - 52	Mn- 52m	Fe- 52	Sb-133
1729.6	2.92	u Bi-214	B-	19.9	M	Na- 27	Ti- 53	Zr- 85	O - 21	Ni- 57
1732.2	1.8E-03	u Pa-234m	B-	1.17	M	As- 82m	As- 82	Al- 30	In-108m	La-134

Energy 1737.7 ～ 1847.4 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						Cd-119	Lu-165			
1737.7	1.2E-04	u Pa-234	B-	6.70	H	Sb-110	Pm-150	Ho-149m	Sb-129	Ho-149
						Rh- 96				
1737.73	0.021	u Pa-234m	B-	1.17	M					
1738.22	0.018	t Ac-228	B-	6.15	H	Ir-185				
1739.1	--	u Bi-214	B-	19.9	M	Bi-194	La-141	Bi-200m1		
1740.4	0.011	t Ac-228	B-	6.15	H	Mo- 91	Kr- 87			
1741.1	7.7E-05	u Pa-234	B-	6.70	H					
1742.	8.0E-03	t Ac-228	B-	6.15	H					
1743.2	5.3E-05	u Pa-234	B-	6.70	H	Rh- 96m	Rb- 81m	In-124		
1744.	7.1E-04	t Tl-208	B-	3.053	M	Cu- 68	Os-177	Y - 98	Ga- 68	Zr- 89
						Ag-102				
1745.28	6.5E-03	t Ac-228	B-	6.15	H	Cd-127	Ga- 74	S - 38	F - 21	
1747.2	--	u Bi-214	B-	19.9	M	Yb-163	I -122	Cl- 40	Er-149	Cd-103
1750.	1.0E-04	u Pa-234	B-	6.70	H	Te-119	Pb-199	Ho-166	Zr- 97	
1750.54	8.0E-03	t Ac-228	B-	6.15	H	Y - 96	K - 35	Y - 96m		
1751.4	9.0E-04	u Bi-214	B-	19.9	M	Ac-234	Cr- 57	Sb-122	K - 44	Eu-140
1757.5	3.8E-05	u Pa-234	B-	6.70	H	Hg-207	La-142	Au-187	Ru-109	Ac-230
1758.11	0.035	t Ac-228	B-	6.15	H	Gd-145	In-118	Sc- 52	Nb- 98	
1759.81	1.4E-03	u Pa-234m	B-	1.17	M	Ba-147	Pd- 97	I -130m	Tc-108	Y - 90
1764.49	15.4	u Bi-214	B-	19.9	M	Pa-236	Po-201m	Ar- 35	Cd-119	Bi-205
1765.44	8.7E-03	u Pa-234m	B-	1.17	M	Er-149m	I -137			
1768.	3.1E-05	u Pa-234	B-	6.70	H	Se- 69	Mn- 58	Zr- 85	Xe-138	K - 38
1770.8	1.1E-04	u Pa-234	B-	6.70	H	Bi-207	Re-177	In-130m1	Be- 11	Co- 56
1772.2	1.8E-03	t Ac-228	B-	6.15	H	Rb- 98m				
1773.	1.1E-04	u Pa-234	B-	6.70	H	Rh-100m				
1778.85	100.	c Al- 28	B-	2.2414	M	Hg-181	As- 68	Zn- 79	In-103	Al- 28
						Gd-142	Ho-151	Rb- 88	In-128m	K - 46
1783.7	4.0E-05	u Pa-234	B-	6.70	H	Ag-104m	Pm-142	Na- 32	Xe-137	Cu- 76gm
1784.4	5.9E-03	t Ac-228	B-	6.15	H	V - 54				
1787.3	1.3E-03	t Ac-228	B-	6.15	H	Mg- 29	Sm-141m	Tm-150	O - 21	As- 76
						P - 34				
1795.1	2.1E-03	t Ac-228	B-	6.15	H	Ta-175	Mn- 50m	Al- 29	V - 47	Hg-207
1796.2	3.1E-04	u Pa-234m	B-	1.17	M					
1797.1	3.8E-04	u Pa-234	B-	6.70	H	Ag-106				
1797.5	2.1E-03	t Ac-228	B-	6.15	H	Au-181	Tb-147m	K - 35		
1800.2	4.1E-03	t Bi-212	B-	60.55	M	Fe- 63	Ga- 64			
1800.86	4.4E-03	t Ac-228	B-	6.15	H	Ru- 93	Y - 98m	Dy-146		
1805.8	8.2E-06	u Pa-234	B-	6.70	H	Eu-145	Eu-143	Y - 95		
1806.	0.09	t Bi-212	B-	60.55	M	Dy-149	Tc-110	Au-181	Gd-143m	Xe-123
1809.04	3.7E-03	u Pa-234m	B-	1.17	M	Au-181	Pa-236	Sn-107	Ar- 45	Rb- 93
						Al- 26	Bi-197m	I -138	Ge- 67	Tm-151m
1812.03	--	c Pb-204	NG			Mn- 56				
1813.73	0.011	u Bi-214	B-	19.9	M					
1815.3	1.5E-05	u Pa-234	B-	6.70	H	Mn- 62	Ac-232	Rh- 98		
1819.2	<1.4E-03	u Bi-214	B-	19.9	M	Nb- 88m	Pr-139			
1819.69	9.0E-04	u Pa-234m	B-	1.17	M	La-145	Ag-100m			
1819.8	6.6E-06	u Pa-234	B-	6.70	H	Mg- 31	Nb- 98	Ru-111		
1823.22	0.044	t Ac-228	B-	6.15	H	Hg-183	F - 23	Ta-176		
1825.1	1.5E-05	u Pa-234	B-	6.70	H	Fe- 51				
1826.7	2.1E-03	t Ac-228	B-	6.15	H	Rh-100m				
1830.8	6.6E-06	u Pa-234	B-	6.70	H	Ir-185	Au-183	Ac-232	Tb-148	Ba-129
						Cd-123				
1831.3	0.017	u Pa-234m	B-	1.17	M	V - 54	Sm-143m2	Zn- 77	Br- 85	Tl-198
1835.43	0.038	t Ac-228	B-	6.15	H	Ag-102m	Cr- 57	Rb- 88	Y - 88	
1838.	6.6E-05	u Pa-234	B-	6.70	H	Rb- 98	Bi-197m			
1838.36	0.36	u Bi-214	B-	19.9	M	Er-159	Zn- 77	Pm-154m		
1842.13	0.042	t Ac-228	B-	6.15	H	Te-114	Ag-115	Cd-123	Si- 26	As- 84
						O - 20				
1847.42	2.11	u Bi-214	B-	19.9	M	Ac-234	Ca- 51	Bi-203	Y - 92	Nb- 92m

Energy 1849.8 ～ 2000.9 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
						As- 80	Tc-100			
1849.8	4.4E-05	u Pa-234	B-	6.70	H	Rb- 91	C - 17			
1850.13	4.4E-03	t Ac-228	B-	6.15	H	In-108m	Cr- 57			
1863.09	1.2E-03	u Pa-234m	B-	1.17	M	Ga- 72	Cu- 60	Bi-205	I -114m	O - 22
						Tb-148	In-129			
1867.68	9.2E-03	u Pa-234m	B-	1.17	M	Br- 89	Rb- 94	In-128m	Tm-166	Te-113
						S - 31	Ge- 79			
1870.83	0.024	t Ac-228	B-	6.15	H	Fr-230	Rb- 93	Cd-105	Ni- 69	
1872.8	5.6E-05	u Pa-234	B-	6.70	H	Cu- 66	Au-183			
1873.16	0.219	u Bi-214	B-	19.9	M	I -137				
1874.85	8.2E-03	u Pa-234m	B-	1.17	M	O - 22	Cu- 70	Tb-144	La-143	Eu-145
						Sc- 40				
1879.6	1.3E-03	t Ac-228	B-	6.15	H	Ca- 47	Se- 87	Cd-103	Gd-145	
1884.1	2.5E-05	u Pa-234	B-	6.70	H	Ge- 81	Ti- 43	Ga- 68	Cu- 68	O - 21
						Ga- 79	Nb- 87	Xe-123	Pr-144m	
1887.1	0.09	t Ac-228	B-	6.15	H	Au-194	Ar- 44	Co- 62	In-120m1	Y - 97
1890.1	2.3E-04	u Pa-234	B-	6.70	H	Pa-238				
1890.3	0.08	u Bi-214	B-	19.9	M	F - 21	Ge- 69	Y - 94		
1893.4	=9.9E-06	u Pa-234	B-	6.70	H	Y - 85m	Ho-150m	Cd-105	Bi-203	
1893.5	2.2E-03	u Pa-234m	B-	1.17	M	Ho-170m				
1895.92	0.16	u Bi-214	B-	19.9	M	Se- 83	As- 82m	As- 83	Na- 26	Ac-234
1896.7	1.6E-04	u Pa-234	B-	6.70	H	Te-114	Cd-105	Br- 84		
1898.7	0.057	u Bi-214	B-	19.9	M	Br- 84m	Rb- 84	Ag-119	Ac-232	Cs-142
1900.07	2.8E-03	t Ac-228	B-	6.15	H	Mn- 51	F - 22	La-142	Te-114	
1907.18	0.012	t Ac-228	B-	6.15	H	C - 17	Sb-118	Rh- 96m	Pr-139	Ir-183
						In-118				
1911.17	6.3E-03	u Pa-234m	B-	1.17	M	Ga- 82	Cd-105	La-132	Sn-109	Re-177
						Eu-143				
1915.5	3.1E-05	u Pa-234	B-	6.70	H	Sn-111				
1915.9	8.0E-04	t Ac-228	B-	6.15	H	Dy-146	As- 83			
1919.5	2.1E-03	t Ac-228	B-	6.15	H	Y - 93	Ga- 66	F - 23	Ni- 57	Y - 86
1925.4	4.8E-04	u Pa-234	B-	6.70	H	Au-194	Zn- 73			
1926.5	4.4E-04	u Pa-234m	B-	1.17	M	Sb-114				
1927.9	8.6E-05	u Pa-234	B-	6.70	H					
1929.78	0.02	t Ac-228	B-	6.15	H	Ru-109	Rh-100	Cd-103	Sn-131gm	Sc- 43
1935.2	=1.5E-05	u Pa-234	B-	6.70	H	In-106m	Ga- 78	Si- 35		
1935.5	0.041	u Bi-214	B-	19.9	M					
1936.3	2.1E-03	t Ac-228	B-	6.15	H	Au-181	Mg- 22	Cd- 99		
1937.01	2.9E-03	u Pa-234m	B-	1.17	M	Dy-147m	Cu- 60	Ni- 67		
1937.7	6.6E-05	u Pa-234	B-	6.70	H	Eu-156	La-143	N - 18	Ag-118	
1943.7	--	u Bi-214	B-	19.9	M	S - 38				
1944.2	2.1E-03	t Ac-228	B-	6.15	H	Rb- 78m	Ir-188	Tb-147m	Ar- 46	Mn- 50m
1952.33	0.059	t Ac-228	B-	6.15	H	Mg- 23	Eu-140			
1953.4	--	u Bi-214	B-	19.9	M	Cu- 70m	Ba-129	S - 29	Ac-234	
1955.9	8.0E-04	t Ac-228	B-	6.15	H	N - 16	Lu-170	Br- 82m		
1958.	1.6E-05	u Pa-234	B-	6.70	H	I -130m				
1958.4	1.5E-03	t Ac-228	B-	6.15	H	Ac-232	As- 80	La-134	Au-181	P - 36
1965.24	0.02	t Ac-228	B-	6.15	H	Ru-109	Te-112	Au-187	Na- 25	Re-177
						Eu-156	I -130m	Br- 86	Cl- 33	
1970.	5.5E-04	u Pa-234m	B-	1.17	M	Au-181	Cs-146	Mn- 60m	Tc-106	Dy-147m
						K - 36				
1971.2	=4.3E-06	u Pa-234	B-	6.70	H	Au-181	As- 82	Sb-110	Rb- 91	Tb-146
1971.9	3.6E-03	t Ac-228	B-	6.15	H	Tb-146m1	Ho-170m	Na- 32	K - 50	Rh- 98
						In-128m				
1977.4	2.6E-05	u Pa-234	B-	6.70	H	Ag-123	Tl-195	Ac-232		
1979.3	1.8E-03	t Ac-228	B-	6.15	H	Na- 30	Pr-144	Zn- 73	La-143	V - 52
1989.6	1.2E-05	u Pa-234	B-	6.70	H	Ho-149	C - 15	Au-181	Au-187	
1994.6	5.0E-03	u Bi-214	B-	19.9	M	Cu- 72	Br- 89	Dy-147m	Si- 35	La-134
						Ag-114	Lu-166m2	Ca- 51		
2000.9	1.0E-03	t Ac-228	B-	6.15	H	Ir-183	As- 69	In-123	Au-181	Mn- 51

Energy 2010. ～ 2430. (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
2010.	1.5E-03	u Tl-210	B-	1.30	M	Ac-232	Rh- 97m	In-120ml	Sc- 46	
2010.78	0.047	u Bi-214	B-	19.9	M	Se- 86	Tl-196	Fe- 61	Kr- 87	Tc- 93m
						Hg-187gm				
2016.7	6.0E-03	u Bi-214	B-	19.9	M	Co- 56	Au-181	Xe-138	Mn- 62	Au-187
2021.6	0.02	u Bi-214	B-	19.9	M	Cs-124	As- 70	P - 36	Cd-119m	Hg-189gm
						Na- 31	K - 49			
2029.4	1.8E-03	t Ac-228	B-	6.15	H	Al- 29	P - 29	In-130	In-130m2	Cd-105
						Br- 84	Dy-149	I -137	Kr- 88	Au-187
2052.94	0.069	u Bi-214	B-	19.9	M	Sc- 51	Se- 83m	Tm-166	Ag-102m	
2072.2	6.6E-06	u Pa-234	B-	6.70	H	Ca- 52	Br- 87	Au-181	Ga- 76	Pm-141
2085.1	9.1E-03	u Bi-214	B-	19.9	M	Cu- 62	Au-187	As- 84		
2089.7	0.05	u Bi-214	B-	19.9	M	Te-119m				
2090.	1.0E-03	u Tl-210	B-	1.30	M	Sb-124	I -124	In-130		
2103.2S	--	t Tl-208	B-	3.052	M	Cs-140	Au-181	As- 81	Rh-108	Eu-143
						La-132	In-128	Cd-119m	Te-115m	Co- 62m
2109.92	0.088	u Bi-214	B-	19.9	M	Br- 89	Zn- 73	Cu- 68m	As- 76	In-126
2118.55	1.14	u Bi-214	B-	19.9	M	Au-181	In-129	Ag-100m	Br- 89	Rb- 88
2120.	7.0E-03	u Bi-214	B-	19.9	M	Tb-154	Sb-110	Er-148		
2147.9	0.014	u Bi-214	B-	19.9	M	Cd-125				
2160.4	1.8E-03	u Bi-214	B-	19.9	M	Co- 60	Co- 60m	Cu- 60	I -114	Ag-102m
2176.5	3.2E-03	u Bi-214	B-	19.9	M	Co- 63	Y - 95	Hg-187gm	Er-149m	
2184.8	--	u Bi-214	B-	19.9	M	Nb-102m	N - 17	Y - 93	Dy-147m	Pr-144
						Y - 90	Eu-156			
2192.58	0.034	u Bi-214	B-	19.9	M	Y - 93	Lu-170	In-131	I -122	
2193.3	--	u Bi-214	B-	19.9	M	Na- 31	Ga- 64			
2204.21	5.08	u Bi-214	B-	19.9	M	As- 83	Zn- 78	Sc- 50		
2223.25	--	c H	NG			Er-149m	Zr- 87	Ti- 42	Mg- 29	P - 38
						Sb-116				
2251.6	5.5E-03	u Bi-214	B-	19.9	M	Xe-138	Cr- 55			
2260.3	8.7E-03	u Bi-214	B-	19.9	M	In-128	In-130ml	V - 54	I -138	
2266.51	0.018	u Bi-214	B-	19.9	M	La-141	Cr- 55			
2270.	6.2E-04	u Tl-210	B-	1.30	M	In-132	Dy-147m	Eu-156		
2270.9	1.3E-03	u Bi-214	B-	19.9	M	Rb- 94	Ni- 67	Cd-105		
2284.3	5.1E-03	u Bi-214	B-	19.9	M	I -124	F - 22	Pm-148	K - 46	Fe- 52m
2287.65	4.6E-03	u Bi-214	B-	19.9	M	Sr- 97	Ti- 43	Al- 32	I -136	
2293.4	0.305	u Bi-214	B-	19.9	M					
2310.2	1.4E-03	u Bi-214	B-	19.9	M	Fe- 53				
2312.4	9.0E-03	u Bi-214	B-	19.9	M	Mn- 51	O - 14	Cl- 33		
2319.3	4.0E-04	u Bi-214	B-	19.9	M	Al- 31	In-110m	Er-149m	Nb- 90	Y - 90m
						Er-149m				
2325.	1.7E-03	u Bi-214	B-	19.9	M	Cd-117m	Si- 26	Sn-111	Lu-166m2	Er-149m
2331.3	0.022	u Bi-214	B-	19.9	M	Cs-140	Pr-134	Dy-147m	Cd-121m	Cd-105
2348.	1.4E-04	u Bi-214	B-	19.9	M	Br- 89	Pb-197	Co- 62	Pr-140	Br- 86
						Kr- 93	Dy-147m			
2353.5	4.0E-04	u Bi-214	B-	19.9	M	Ar- 33	V - 54	K - 45	Ga- 74	O - 19
2358.	--	u Bi-214	B-	19.9	M	Cd-119	Ar- 45	As- 80	La-146	
2360.	1.7E-03	u Tl-210	B-	1.30	M	La-145				
2361.	1.7E-03	u Bi-214	B-	19.9	M	Sb-118m	Tl-191m			
2369.	2.7E-03	u Bi-214	B-	19.9	M	V - 47	Er-149m	Cr- 55	Ca- 49	Br- 72
2376.9	8.8E-03	u Bi-214	B-	19.9	M	Ga- 64	V - 48	Rh-100	In-130m2	In-131m2
2390.8	1.6E-03	u Bi-214	B-	19.9	M	K - 48	In-130ml	Na- 28	In-120	Mg- 23
						Kr- 88	Cd-125m	Tc- 94m		
2396.5	--	u Bi-214	B-	19.9	M	La-142				
2405.1	4.1E-04	u Bi-214	B-	19.9	M	I -120m	Cu- 72			
2413.1	--	u Bi-214	B-	19.9	M	Rb- 82	I -136	F - 23	In-122	
2421.	--	u Bi-214	B-	19.9	M	Mo- 89	Rb- 78	Y - 98	In-110m	V - 48
2423.27	4.6E-03	u Bi-214	B-	19.9	M	Cd-119m	S - 29	Ga- 66	Eu-144	K - 42
						N - 18	Al- 29	P - 29		
2430.	1.9E-03	u Tl-210	B-	1.30	M	Fe- 63	O - 20	K - 36		
2430.	--	u Bi-214	B-	19.9	M					

Energy 2444.7 ～ 3269.7 (keV)

Energy (keV)	Intensity (%)	Nuclide	Decay mode	Half life		Relational artificial radionuclide				
2444.7	8.0E-03	u Bi-214	B-	19.9	M	Ga- 81				
2447.86	1.57	u Bi-214	B-	19.9	M					
2459.	--	u Bi-214	B-	19.9	M	Ti- 53	Cl- 40	Ti- 43	As- 68	As- 84
2469.4	--	u Bi-214	B-	19.9	M	Mg- 32	Sc- 52	Er-149m	K - 36	Pr-138
2482.8	1.5E-03	u Bi-214	B-	19.9	M	Dy-147m	Br- 84	Kr- 91		
2505.4	5.7E-03	u Bi-214	B-	19.9	M	Mn- 49	Co- 60	Na- 27	Ag-112	Ga- 72
2529.7	--	u Bi-214	B-	19.9	M	Rh- 98	Mg- 31	Tc- 94m	Cs-139	
2540.3	--	u Bi-214	B-	19.9	M	Si- 33	P - 36	Mn- 50m	Na- 26	Ne- 23
2550.7	4.6E-04	u Bi-214	B-	19.9	M	V - 47				
2553.	=1.0E-04	u Bi-214	B-	19.9	M					
2555.1	--	u Bi-214	B-	19.9	M	Kr- 87				
2562.	1.8E-04	u Bi-214	B-	19.9	M	Na- 29	Cl- 34m	Cd-121m		
2564.	1.4E-04	u Bi-214	B-	19.9	M	K - 52	Rb- 91	I -120		
2604.5	4.0E-04	u Bi-214	B-	19.9	M	Cd-123m	Kr- 93	Er-149m		
2614.53	35.64	t Tl-208	B-	3.053	M	Ag-102	Ag-102m	Sm-143	C - 18	Na- 29
2614.53	--	c Pb-208	NN			Na- 29	Br- 74	Cd-125m		
2630.9	8.0E-04	u Bi-214	B-	19.9	M	Sb-134	Rh- 94m	Mo- 91	Y - 95	
2662.4	3.0E-04	u Bi-214	B-	19.9	M	Se- 86	Sr-101	Br- 74	Ag-116	Lu-170
2694.7	0.031	u Bi-214	B-	19.9	M	Ar- 35	Sr-101	Ag-118m	In-123m	
2699.4	2.8E-03	u Bi-214	B-	19.9	M	Tc- 93m	Tc-106			
2719.3	1.8E-03	u Bi-214	B-	19.9	M	Tc- 91	Sr- 95			
2769.9	0.025	u Bi-214	B-	19.9	M	Y -100				
2785.9	5.5E-03	u Bi-214	B-	19.9	M	Lu-170	Ag-119	Ag-118		
2827.	2.3E-03	u Bi-214	B-	19.9	M	Sn-107	Ho-149			
2861.1	3.8E-04	u Bi-214	B-	19.9	M					
2880.3	9.2E-03	u Bi-214	B-	19.9	M	Co- 62m				
2893.5	6.0E-03	u Bi-214	B-	19.9	M	Br- 89	Se- 88	Be- 11		
2921.9	0.014	u Bi-214	B-	19.9	M	Ga- 76				
2928.6	1.1E-03	u Bi-214	B-	19.9	M					
2934.6	4.6E-04	u Bi-214	B-	19.9	M	Dy-147m	Sr- 95	K - 35		
2978.9	0.014	u Bi-214	B-	19.9	M	Si- 27	Ne- 23			
3000.	8.8E-03	u Bi-214	B-	19.9	M	Br- 87	S - 29	Ar- 35		
3053.9	0.021	u Bi-214	B-	19.9	M					
3081.7	4.8E-03	u Bi-214	B-	19.9	M	Na- 28	Rb- 78	Ca- 49		
3094.	4.4E-04	u Bi-214	B-	19.9	M	Nb- 89				
3142.6	1.2E-03	u Bi-214	B-	19.9	M	Tb-146m1				
3149.	=8.8E-05	u Bi-214	B-	19.9	M	Rb- 98	Mo- 91			
3160.6	3.2E-04	u Bi-214	B-	19.9	M	Co- 62	Mn- 52m			
3183.6	1.3E-03	u Bi-214	B-	19.9	M	In-130m2	Rh- 95m	Tc-106		
3233.2	=1.0E-04	u Bi-214	B-	19.9	M	Br- 90	In-123m	Ru- 93	Te-136	
3269.7	=6.0E-05	u Bi-214	B-	19.9	M	Cu- 62				

Appendix A. Natural radioactive families

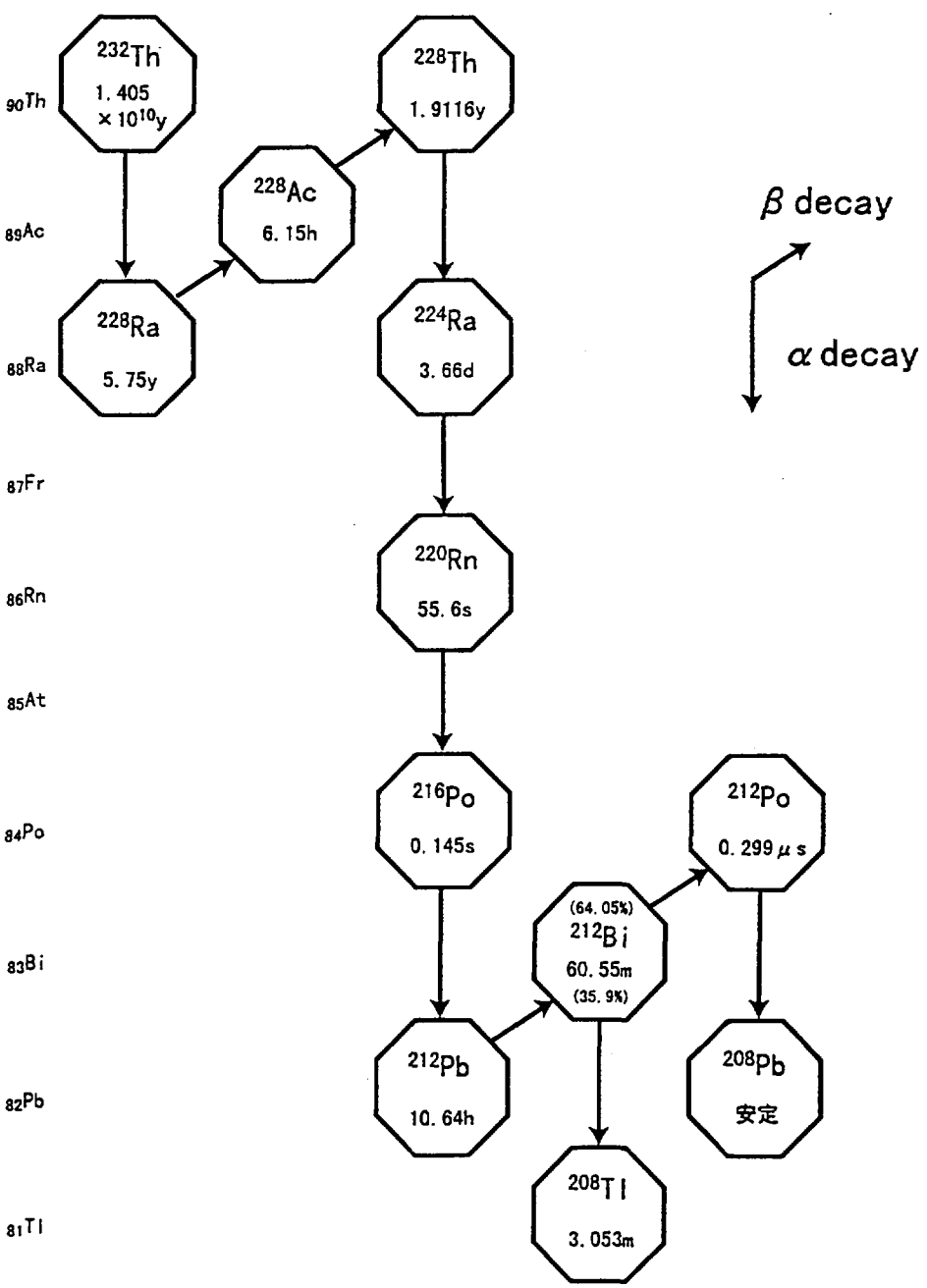
Thorium series (A=4n)

Uranium series (4n+2)

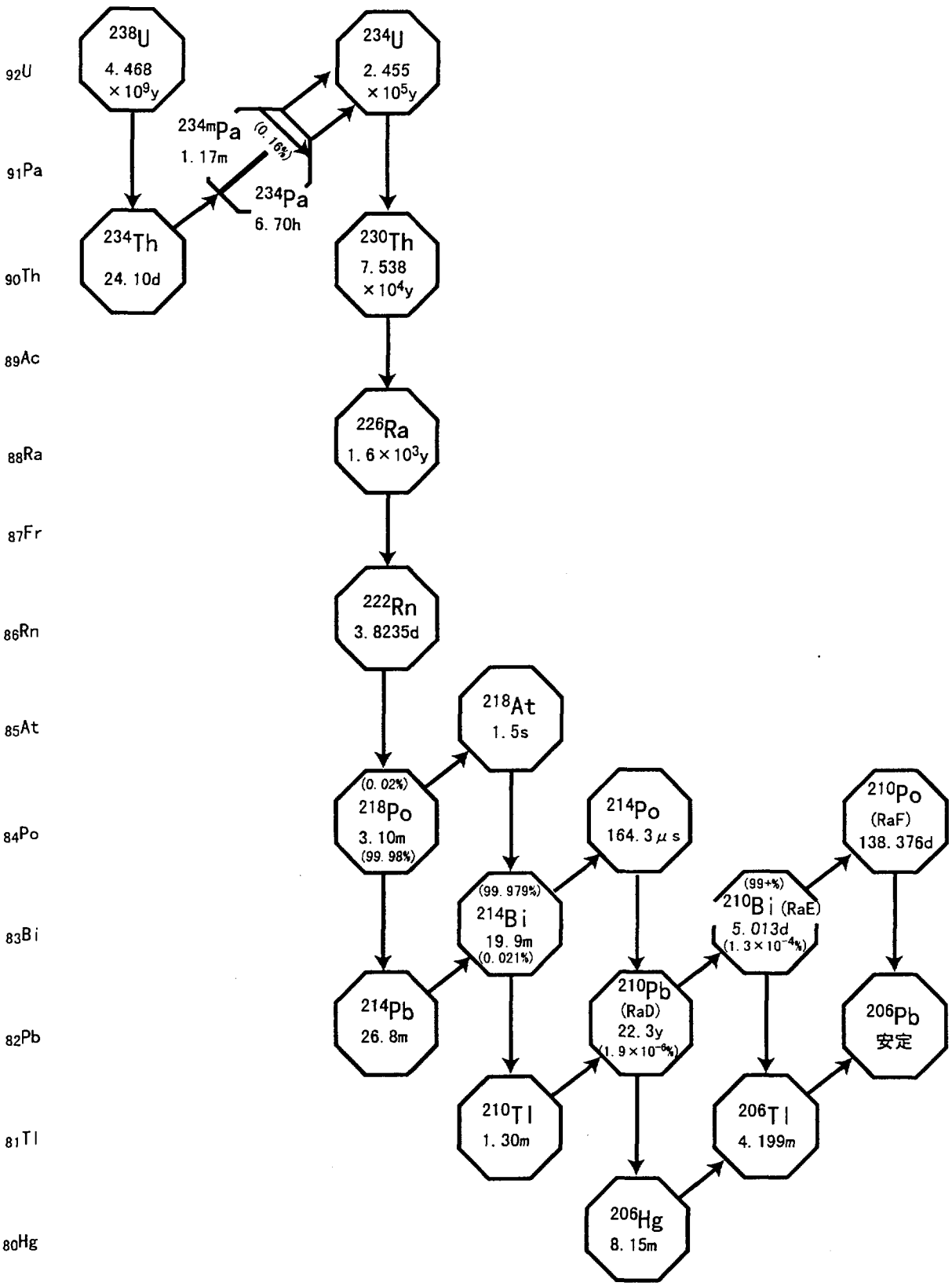
Actinium series (4n+3)

Natural Radioactive Families

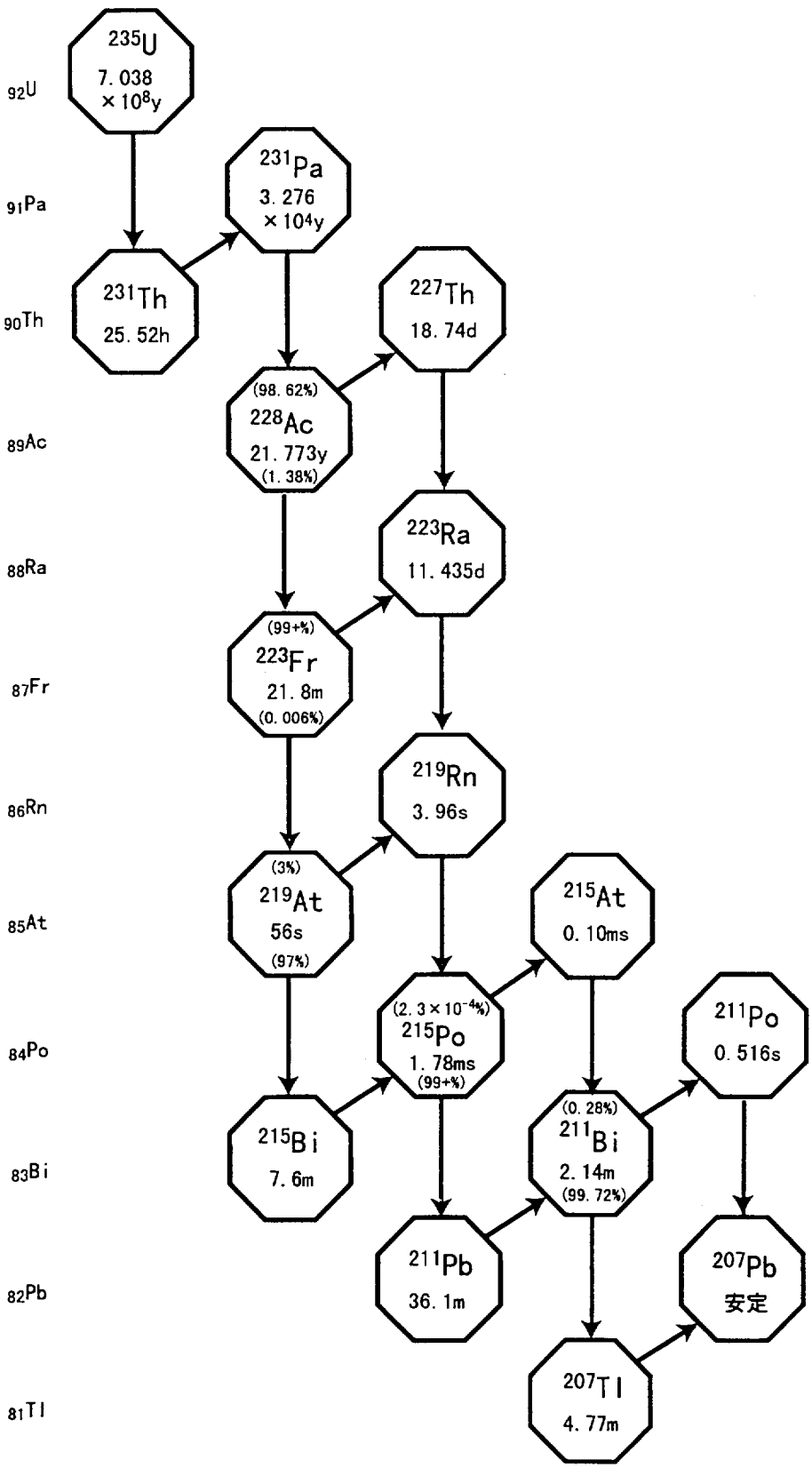
Thorium Series



Uranium Series



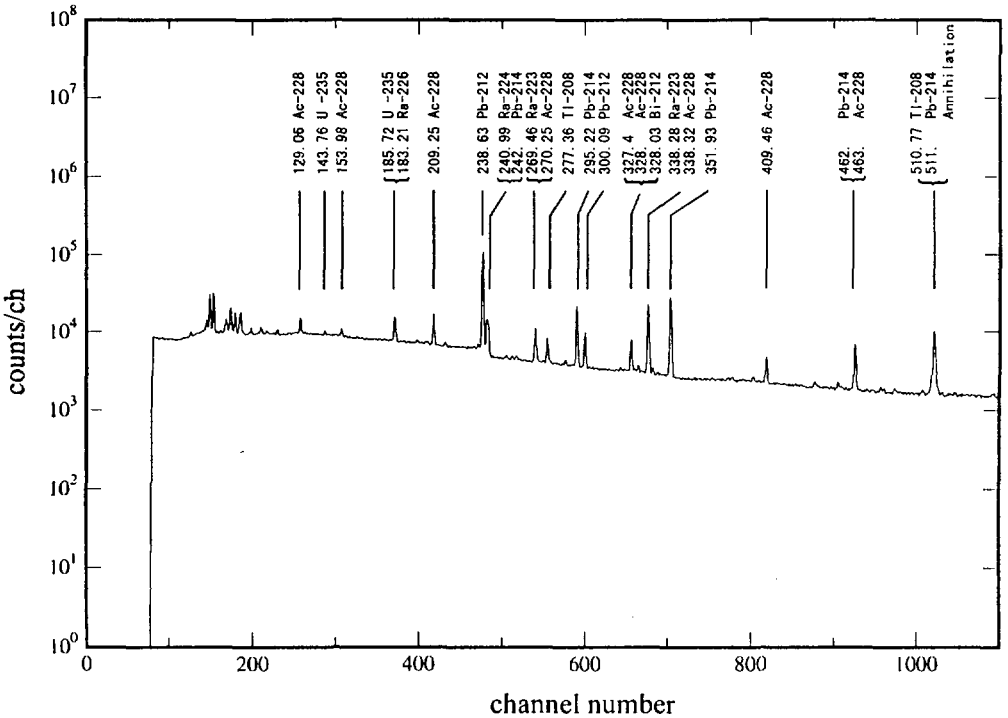
Actinium Series



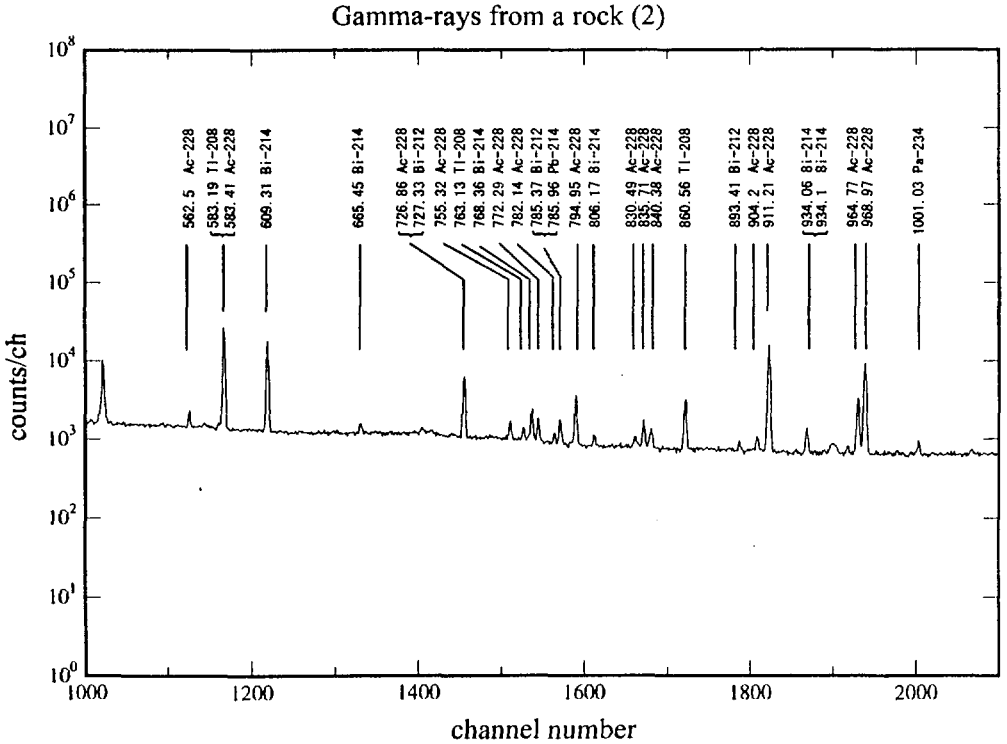
Appendix B. Some examples of natural gamma-ray spectrum

Rock. Uranium ore, Thorium, Monazite, Uraninite, and Natural background

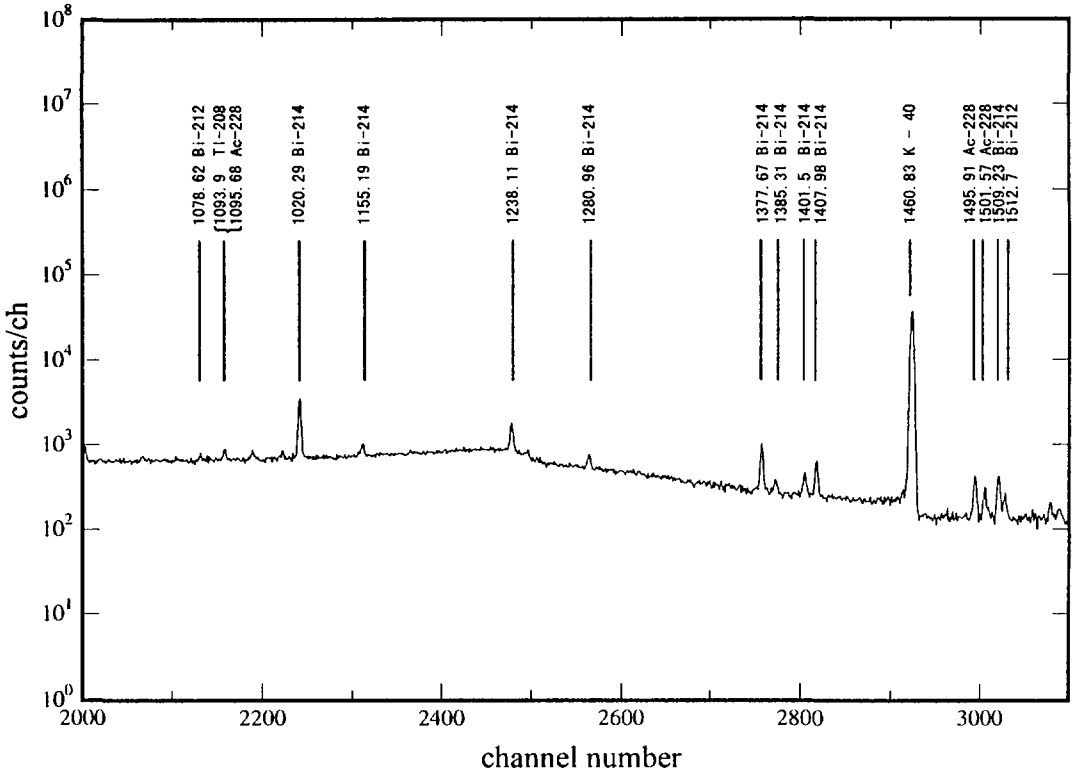
Gamma-rays from a rock (1)



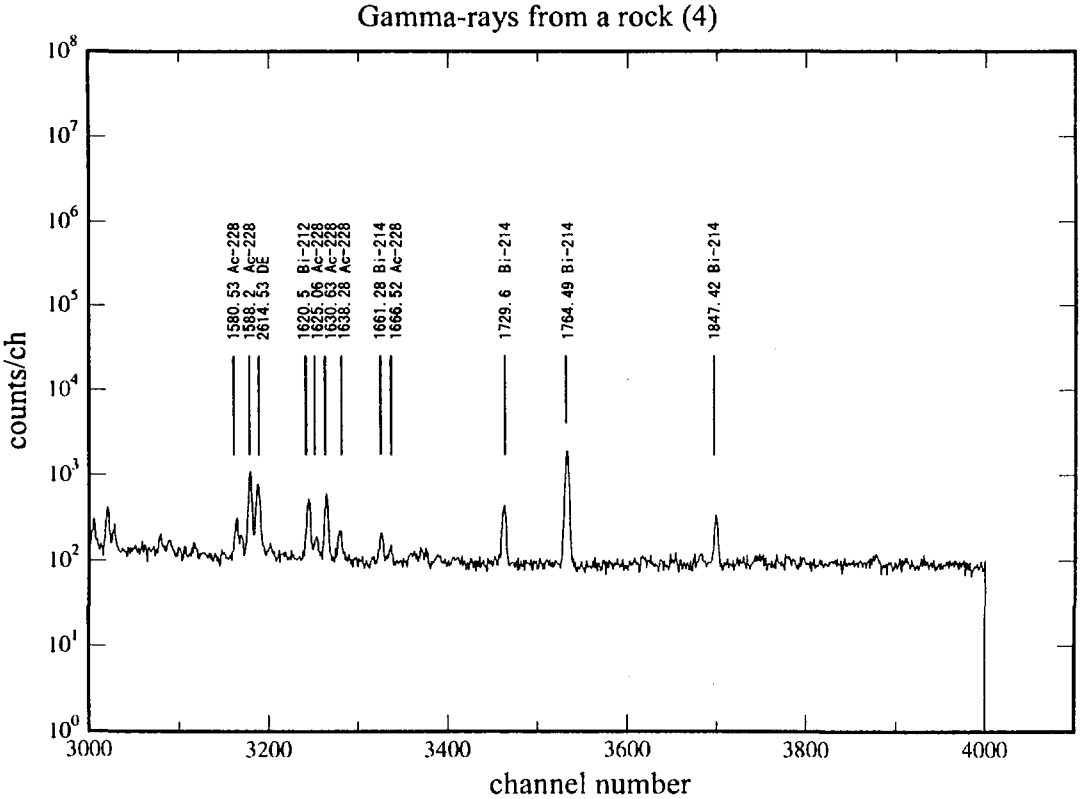
Gamma-rays from a rock (2)

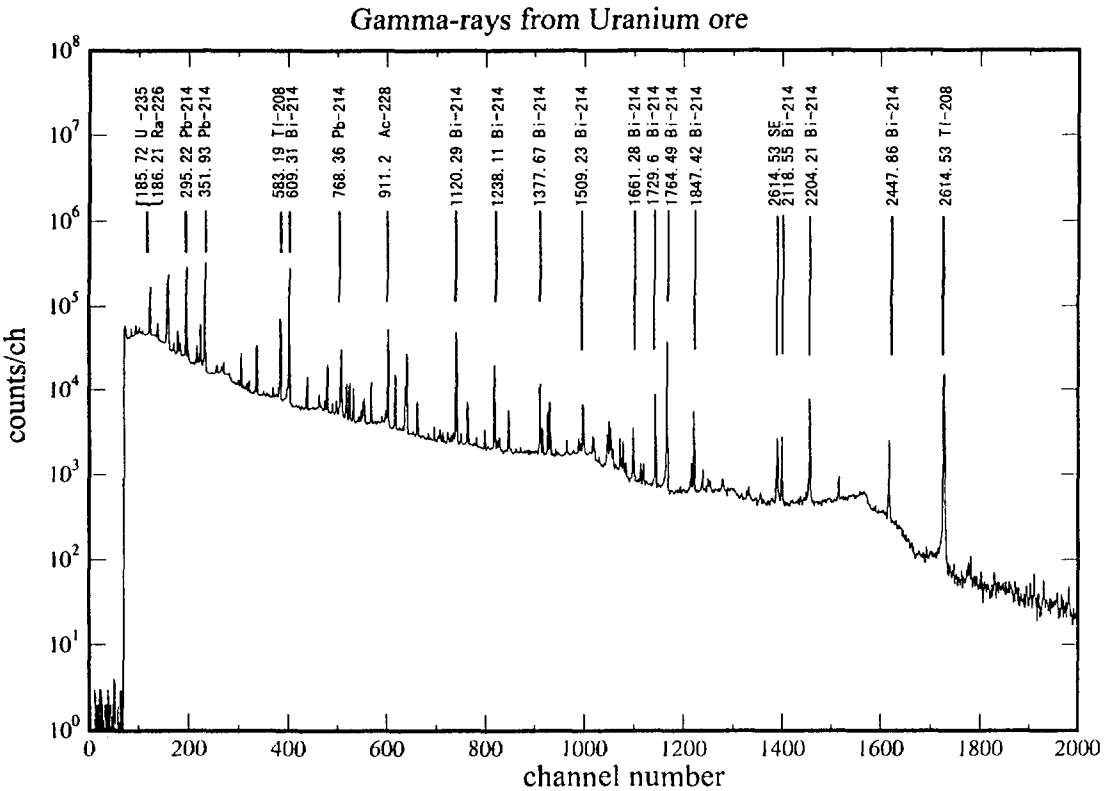


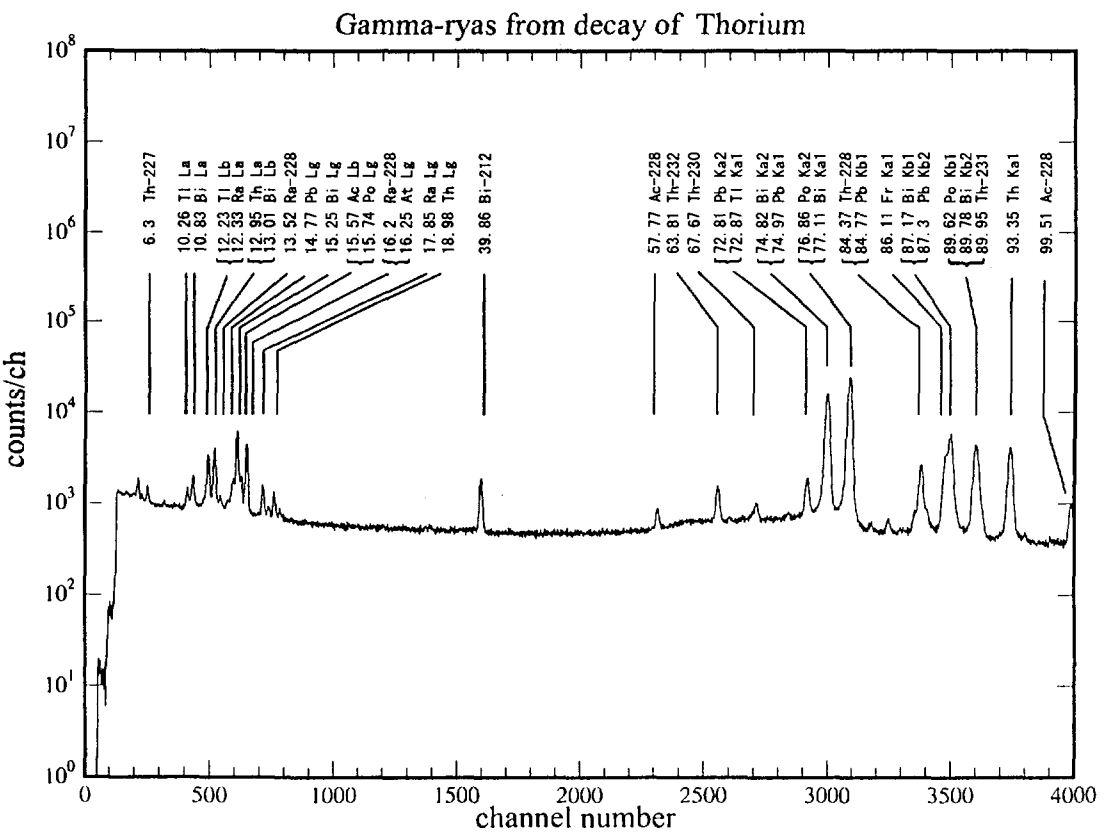
Gamma-rays from a rock (3)



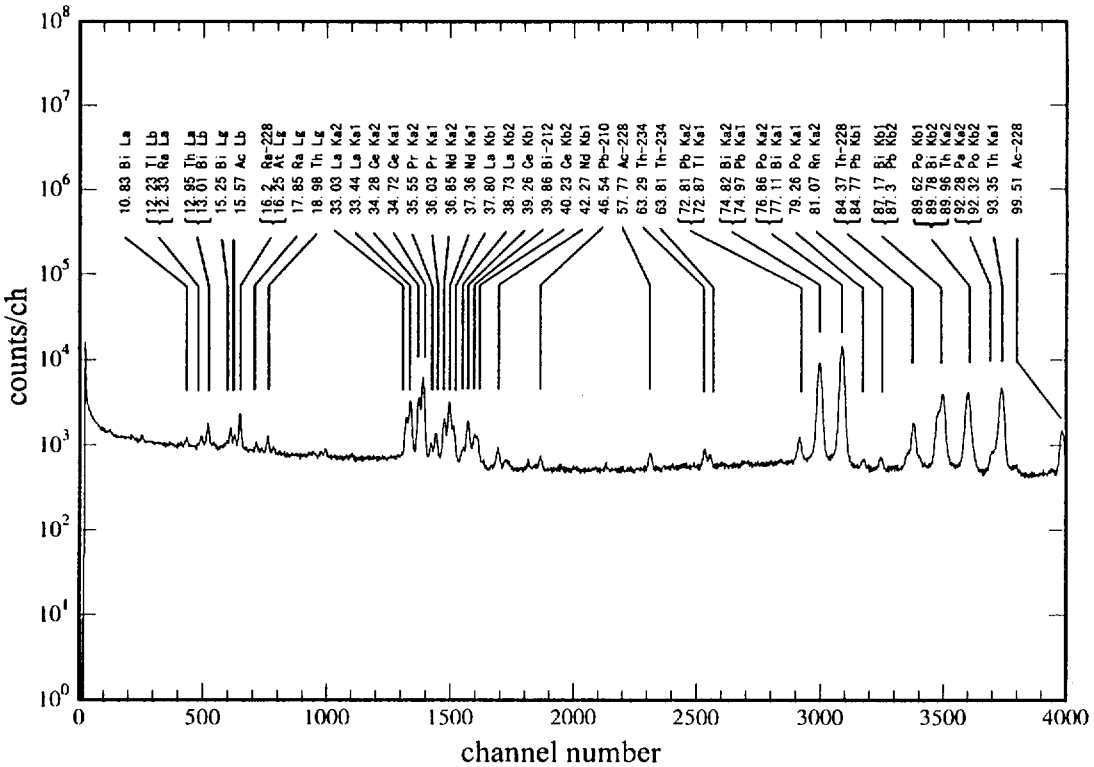
Gamma-rays from a rock (4)



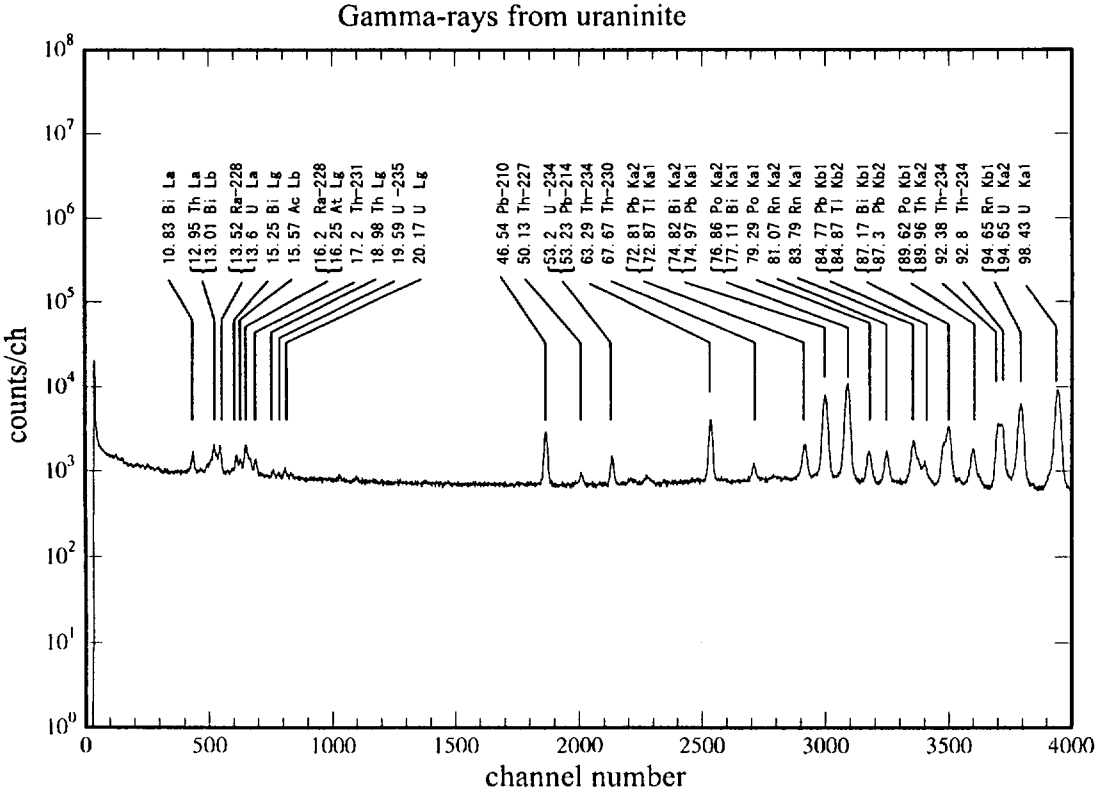

Gamma-rays from Uranium ore
counts/ch
channel number
185.72 U-235
186.21 Ra-226
295.22 Pb-214
351.93 Pb-214
583.19 Tl-208
609.31 Bi-214
768.36 Pb-214
911.2 Ac-228
1120.29 Bi-214
1238.11 Bi-214
1377.67 Bi-214
1509.23 Bi-214
1661.28 Bi-214
1729.6 Bi-214
1764.49 Bi-214
1847.42 Bi-214
2614.53 SE
2118.55 Bi-214
2204.21 Bi-214
2447.86 Bi-214
2614.53 Tl-208


Gamma-ryas from decay of Thorium
counts/ch
channel number
6.3 Th-227
10.26 Tl La
10.83 Bi La
12.23 Tl Lb
12.33 Ra La
12.95 Th La
13.01 Bi Lb
13.52 Ra-228
14.77 Pb Lg
15.25 Bi Lg
15.57 Ac Lb
15.74 Po Lg
16.2 Ra-228
16.25 At Lg
17.85 Ra Lg
18.98 Th Lg
39.86 Bi-212
57.77 Ac-228
63.81 Th-232
67.67 Th-230
72.81 Pb Ka2
72.87 Tl Ka1
74.82 Bi Ka2
74.97 Pb Ka1
76.86 Po Ka2
77.11 Bi Ka1
84.37 Th-228
84.77 Pb Kb1
86.11 Fr Ka1
87.17 Bi Kb1
87.3 Pb Kb2
89.62 Po Kb1
89.78 Bi Kb2
89.95 Th-231
93.35 Th Ka1
99.51 Ac-228

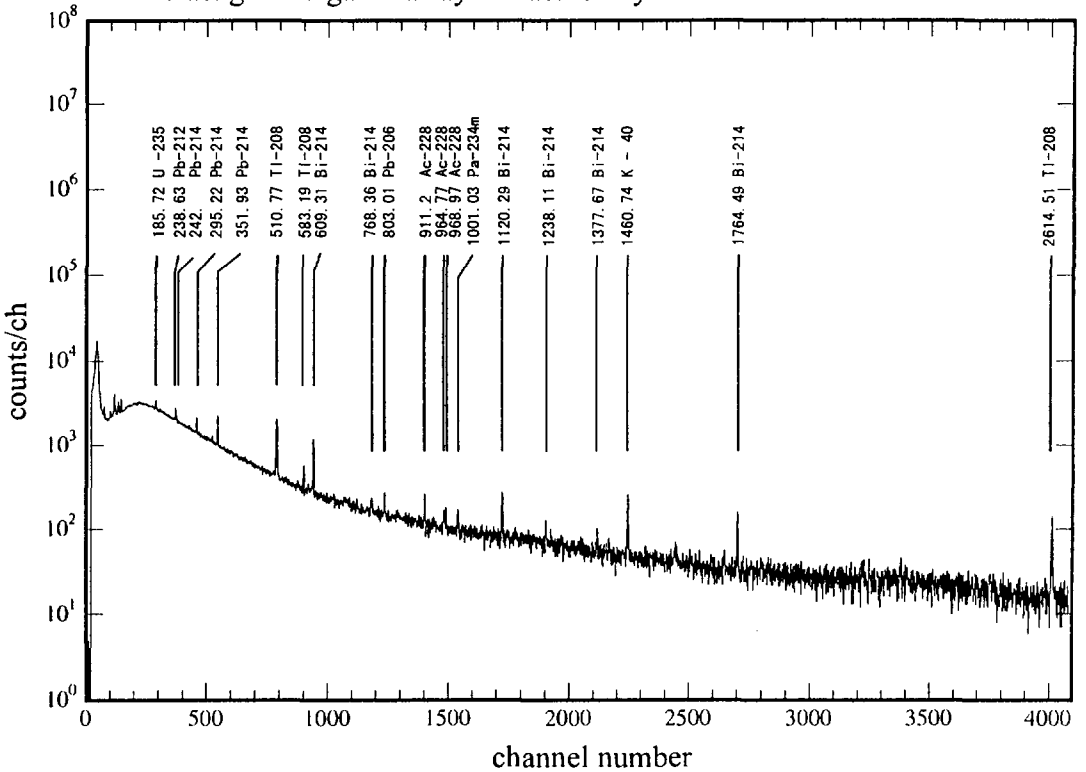
Gamma-rays from monazite



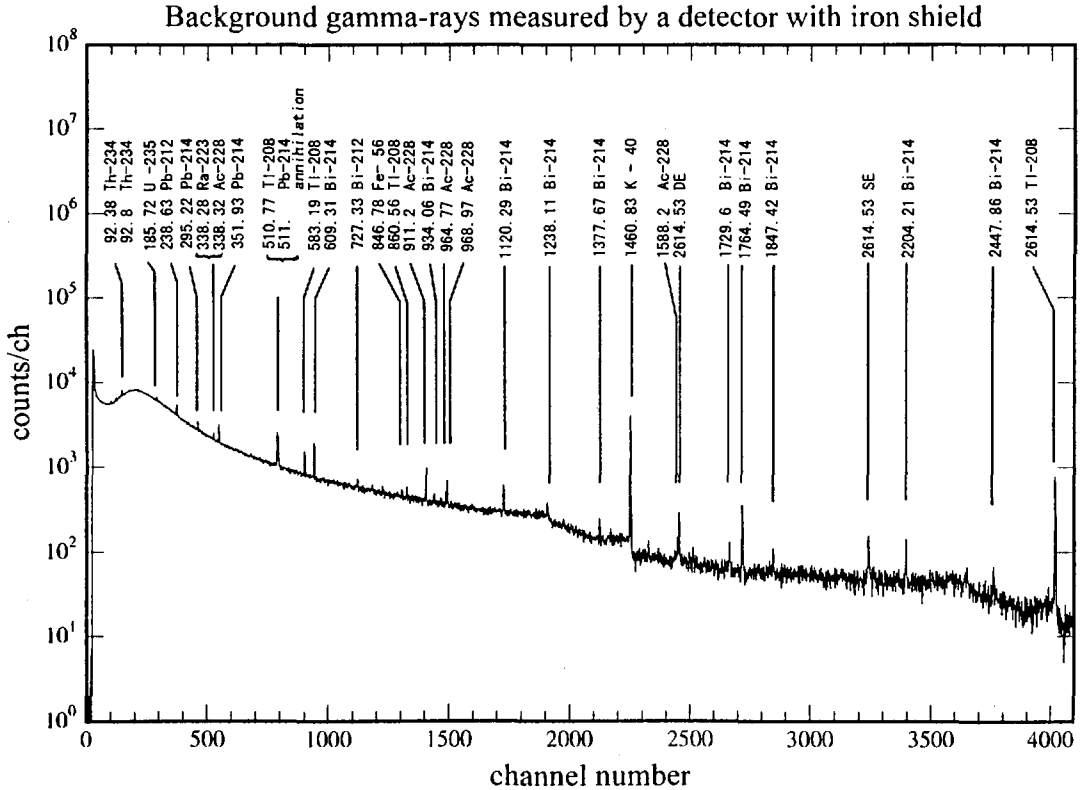
Gamma-rays from uraninite



Background gamma-rays measured by a detector with lead shield



Background gamma-rays measured by a detector with iron shield



国際単位系 (SI) と換算表

表 1　SI基本単位および補助単位

量	名称	記号
長さ	メートル	m
質量	キログラム	kg
時間	秒	s
電流	アンペア	A
熱力学温度	ケルビン	K
物質量	モル	mol
光度	カンデラ	cd
平面角	ラジアン	rad
立体角	ステラジアン	sr

表 2　SIと併用される単位

名称	記号
分，時，日	min，h，d
度，分，秒	°，′，″
リットル	l，L
トン	t
電子ボルト	eV
原子質量単位	u

$1\ \mathrm{eV} = 1.60218 \times 10^{-19}\ \mathrm{J}$

$1\ \mathrm{u} = 1.66054 \times 10^{-27}\ \mathrm{kg}$

表 3　固有の名称をもつSI組立単位

量	名称	記号	他のSI単位による表現
周波数	ヘルツ	Hz	s^{-1}
力	ニュートン	N	$m \cdot kg/s^2$
圧力，応力	パスカル	Pa	N/m^2
エネルギー，仕事，熱量	ジュール	J	$N \cdot m$
工率，放射束	ワット	W	J/s
電気量，電荷	クーロン	C	$A \cdot s$
電位，電圧，起電力	ボルト	V	W/A
静電容量	ファラド	F	C/V
電気抵抗	オーム	Ω	V/A
コンダクタンス	ジーメンス	S	A/V
磁束	ウェーバ	Wb	$V \cdot s$
磁束密度	テスラ	T	Wb/m^2
インダクタンス	ヘンリー	H	Wb/A
セルシウス温度	セルシウス度	℃	
光束	ルーメン	lm	$cd \cdot sr$
照度	ルクス	lx	lm/m^2
放射能	ベクレル	Bq	s^{-1}
吸収線量	グレイ	Gy	J/kg
線量当量	シーベルト	Sv	J/kg

表 4　SIと共に暫定的に維持される単位

名称	記号
オングストローム	Å
バーン	b
バール	bar
ガル	Gal
キュリー	Ci
レントゲン	R
ラド	rad
レム	rem

$1\ \text{Å} = 0.1\ \mathrm{nm} = 10^{-10}\ \mathrm{m}$

$1\ \mathrm{b} = 100\ \mathrm{fm}^2 = 10^{-28}\ \mathrm{m}^2$

$1\ \mathrm{bar} = 0.1\ \mathrm{MPa} = 10^5\ \mathrm{Pa}$

$1\ \mathrm{Gal} = 1\ \mathrm{cm/s}^2 = 10^{-2}\ \mathrm{m/s}^2$

$1\ \mathrm{Ci} = 3.7 \times 10^{10}\ \mathrm{Bq}$

$1\ \mathrm{R} = 2.58 \times 10^{-4}\ \mathrm{C/kg}$

$1\ \mathrm{rad} = 1\ \mathrm{cGy} = 10^{-2}\ \mathrm{Gy}$

$1\ \mathrm{rem} = 1\ \mathrm{cSv} = 10^{-2}\ \mathrm{Sv}$

表 5　SI接頭語

倍数	接頭語	記号
10^{18}	エクサ	E
10^{15}	ペタ	P
10^{12}	テラ	T
10^{9}	ギガ	G
10^{6}	メガ	M
10^{3}	キロ	k
10^{2}	ヘクト	h
10^{1}	デカ	da
10^{-1}	デシ	d
10^{-2}	センチ	c
10^{-3}	ミリ	m
10^{-6}	マイクロ	μ
10^{-9}	ナノ	n
10^{-12}	ピコ	p
10^{-15}	フェムト	f
10^{-18}	アト	a

（注）

1. 表1－5は「国際単位系」第5版，国際度量衡局 1985年刊行による。ただし，1 eVおよび1 uの値はCODATAの1986年推奨値によった。
2. 表4には海里，ノット，アール，ヘクタールも含まれているが日常の単位なのでここでは省略した。
3. barは，JISでは流体の圧力を表わす場合に限り表2のカテゴリーに分類されている。
4. EC閣僚理事会指令ではbar，barnおよび「血圧の単位」mmHgを表2のカテゴリーに入れている。

換　算　表

力	N(=10^5dyn)	kgf	lbf
	1	0.101972	0.224809
	9.80665	1	2.20462
	4.44822	0.453592	1

粘度　1 Pa·s(N·s/m²)=10 P(ポアズ)(g/(cm·s))

動粘度　1 m²/s=10⁴St(ストークス)(cm²/s)

圧力	MPa(=10 bar)	kgf/cm²	atm	mmHg(Torr)	lbf/in²(psi)
	1	10.1972	9.86923	7.50062×10^3	145.038
	0.0980665	1	0.967841	735.559	14.2233
	0.101325	1.03323	1	760	14.6959
	1.33322×10^{-4}	1.35951×10^{-3}	1.31579×10^{-3}	1	1.93368×10^{-2}
	6.89476×10^{-3}	7.03070×10^{-2}	6.80460×10^{-2}	51.7149	1

エネルギー・仕事・熱量	J(=10^7erg)	kgf·m	kW·h	cal(計量法)	Btu	ft·lbf	eV
	1	0.101972	2.77778×10^{-7}	0.238889	9.47813×10^{-4}	0.737562	6.24150×10^{18}
	9.80665	1	2.72407×10^{-6}	2.34270	9.29487×10^{-3}	7.23301	6.12082×10^{19}
	3.6×10^6	3.67098×10^5	1	8.59999×10^5	3412.13	2.65522×10^6	2.24694×10^{25}
	4.18605	0.426858	1.16279×10^{-6}	1	3.96759×10^{-3}	3.08747	2.61272×10^{19}
	1055.06	107.586	2.93072×10^{-4}	252.042	1	778.172	6.58515×10^{21}
	1.35582	0.138255	3.76616×10^{-7}	0.323890	1.28506×10^{-3}	1	8.46233×10^{18}
	1.60218×10^{-19}	1.63377×10^{-20}	4.45050×10^{-26}	3.82743×10^{-20}	1.51857×10^{-22}	1.18171×10^{-19}	1

1 cal = 4.18605 J（計量法）
= 4.184 J　（熱化学）
= 4.1855 J　（15 °C）
= 4.1868 J（国際蒸気表）

仕事率　1 PS（仏馬力）
= 75 kgf·m/s
= 735.499 W

放射能	Bq	Ci
	1	2.70270×10^{-11}
	3.7×10^{10}	1

吸収線量	Gy	rad
	1	100
	0.01	1

照射線量	C/kg	R
	1	3876
	2.58×10^{-4}	1

線量当量	Sv	rem
	1	100
	0.01	1

（86年12月26日現在）

NATURAL BACKGROUND GAMMA-RAY SPECTRUM LIST OF GAMMA-RAYS ORDERED IN ENERGY FROM NATURAL RADIONUCLIDES