四．常用放射性核素表

4-1 **常用放射性核核素表**

放射性核素	半衰期	衰变类型和分支比(%)	主要α, ß辐射能量（keV）与绝对强度（%）	主要γ，X射线能量（keV）与绝对强度（%）	* 核转移过程释放总能量 MeV/nt	生产方式
^{3}H	10.32 y	ß⁻ (100)	18.5866(100)		0.0057	^{6}Li(n,α)
^{7}Be	53.22 d	EC(100)		498.6(10.44)	0.0499	^{6}Li(d,n)
^{11}C	20.39 m	ß⁺ (99.96)	960.2(99.77)	γ±511	1.4043	^{10}B(d,n)
^{14}C	5700 y	ß⁻ (100)	156.467(100)		0.0495	^{14}N(n,p)
^{13}N	9.965 m	ß⁺ (99.9)	1198.4	γ±511(≤199.61)	1.5109	^{13}C(p,n)
^{15}O	122.24 s	ß⁺(99.9)	1731.9(99.9)	γ±511(199.8)	1.7557	^{13}N(d,n)
^{18}F	109.77 m	ß⁺(96.73) EC(3.27)	633.5(96.73)	γ±511(≤193.46)	1.2302	^{18}O(p,n)
^{22}Na	2.6019 y	EC(10.1) ß⁺ (89.9)	545.4(89.84) 1820(0.056)	1274.53(99.94) XK:0.84(0.1253) γ±511(≤179.79)	2.3866	^{19}F(α,n)
^{24}Na	14.959 h	ß⁻ (100)	1369(99.994)	1369(99.994) 2754(99.876) 472.2(99.95)	4.6770	^{23}Na(n,γ)
^{27}Mg	9.458 m	ß⁻ (100)	1594.8(29) 1765.5(71)	170.686(0.8) 843.76(71.8) 1014.44(28)	1.5933	^{26}Mg(n,γ)
^{28}Mg	20.915 h	ß⁻ (100)	211.7(5) 458.9(95) 859.6(0.31)	30.64 (66) 400.69 (36.6) 941.45 (38.3) 1342.25 (52.6) 1372.89 (4.7) 1589.36 (4.2) XK 1.48(0.97)	1.5310	Mg(t,p)
^{26}Al	7.17E+5 y	EC(18.27) ß⁺ (81.7 3)	1173.45(81.73)	1129.67(2.5) 1808.65(99.76) 2938(0.24) γ±511(≤163.46) XK 1.25(0.443)	3.1195	^{26}Mg(p,n)
^{28}Al	2.2414 m	ß⁻ (100)	2.862.8(99.99)	1778.85(100)	3.0205	^{27}Al(n,γ)
^{31}Si	157.3 m	ß⁻ (100)	224.3(0.07) 1490.5(99.93)	1266.15(0.07)	0.5957	^{30}Si(n,γ)
^{30}P	2.498 m	EC(0.15) ß⁺ (99.85)	3203.7(99.803)	2235.37(0.069) γ±:511(≤199.71)	2.4610	^{29}P(pγ)
^{32}P	14.263 d	ß⁻ (100)	1710.3(100)		0.6948	^{31}P(n,γ)

						^{32}S(n,p)
^{33}P	25.34 d	ß⁻ (100)	248.5(100)		0.0764	^{33}S(n,p)
^{35}S	87.51 d	ß⁻(100)	166.84(100)		0.0487	^{35}Cl(n,p) ^{34}S(n,γ)
^{36}Cl	3.01E+5 y	EC(1.9) ß⁻ (98.1)	709(98.16)	XK:2.3(0.13) γ±:511(⩽0.03)	0.2733	^{35}Cl(n,γ)
^{38}Cl	37.24 m	ß⁻(100)	1106.3(31.9) 2749(10.5) 4916.4(57.6)	1643(31.9) 2176(42.4)	2.9934	^{37}Cl(n,γ)
^{37}Ar	35.04 d	EC(100)		XK :2.62(8.5)	0.0025	^{36}Ar(n,γ)
^{41}Ar	109.61 m	ß⁻(100)	1198.7(99.1) 2492.3(0.83)	1494(99.1) 1677(0.052)	1.7474	^{40}Ar(n,γ)
^{40}K	1.251E+9 y	EC(10.72) ß⁺ (0.001) ß⁻(89.28)	1312.1(89.27)	1461(10.67) XK 2.95(0.94)	0.6785	天然
^{42}K	12.36 h	ß⁻(100)	1687.8(0.34) 2000.3(17.64) 3525.1(81.9)	312.6(0.336) 899.4(0.052) 1525(18.08)	1.7090	^{41}K(n,γ)
^{43}K	22.3 h	ß⁻(100)	423(2.6) 827(90.9) 1224(4.06) 1444(0.9) 1817(1.54)	220.6(4.8) 372.8(86.8) 396.9(11.85) 593.4(11.26) 617.5(79.2)	1.2739	^{40}Ar(a,p)
^{45}Ca	162.67 d	ß⁻ (100)	256.8(100)		0.0772	^{44}Ga(n,γ)
^{47}Ca	4.536 d	ß⁻(100)	113.7(0.039) 494.8(81) 1225(0.087) 1991.9(19)	489.23 (6.2) 807.86 (6.2) 1297.1 (71)	1.4042	^{46}Ca(n,γ)
^{44}Sc	3.97 h	EC(5.73) ß⁺ (94.27)	1474.2(94.27)	1157(99.9) 1499(0.908) 2656.48(0.112) γ±511(⩽188.54)	2.7330	^{41}K(a,n)
^{46}Sc	83.79 d 18.75 s	ß⁻ (100) IT(100)	356.6(99.996) 1477.2(0.0036)	889.271(99.984) 1120.537(99.98) 142.528(62) XK :4.5(0.0039)	2.1217	^{45}Sc(n,γ)
^{47}Sc	3.3492 d	ß⁻(100)	440.7(68.4) 600.1(31.6)	159.38(68.3) XK_{a1} 4.51(0.0357)	0.2713	Ca(ß)
^{49}Sc	57.2 m	ß⁻(100)	232(0.05) 1994(99.94)	1622.6(0.01) 1761.9(0.05)	0.8188	^{48}Ca(d,n)
^{44}Ti	60 y	EC(100)		67.868(93.12) 78.36(95.5) $XK_{ß}$:4.46(2.17)	0.1504	^{45}Sc(p,2n)

				$XK_{\alpha 2}$:4.0861(5.55 $XK_{\alpha 1}$: .0906(11.3)		
^{51}Ti	5.76 m	ß—(100)	1542(8.1) 2150.5(91.9)	320.076(93.1) 928.63(6.9) $XK_{\alpha 1}$:4.9522(0.0232)	1.2383	^{50}Ti(n,γ)
^{48}V	15.9735 d	EC(50.3) ß$^+$ (49.7)	694.6(49.9) 2006.7(0.4)	944.132(7.76) 983.521(100) 1312.096(97.5) 2240.395(2.41) $XK_{\alpha 1}$:4.51084(5.77) γ±511(⩽100.59)	3.0666	^{48}Ti(p,n)
^{49}V	330 d	EC(100)		XK_{β} :4.93(2.3) $XK_{\alpha 2}$:4.50486(5.78) $XK_{\alpha 1}$:4.51084(11.47	0.0045	^{52}Cr(p,α)
^{52}V	3.743 m	ß—(100)	813.9(0.008) 1010(0.116) 2541.5(99.22)	1333.62(0.588) 1434.06(100) 1530.67(0.116)	2.5133	^{51}V(n,γ)
^{51}Cr	27.7025 d	EC (100)		320.0835(9.87) XK_{β}:5.43(2.62) $XK_{\alpha 1}$:4.94464(6.6) $XK_{\alpha 2}$:4.952.2(13.1)	0.0367	^{50}Cr(n,γ)
^{52}Mn	5.591 d	EC(70.4) ß$^+$ (29.6)	576(29.6)	744.233(90) 935.5(94.5) 1434(100) $XK_{\alpha 1}$: 5.414(10.4) γ±511(⩽59.2)	3.5335	^{52}Fe(EC) ^{52}Cr(p,n)
^{54}Mn	312.12 d	EC(100)		834.838(99.975) XL:0.57(0.37) XK_{β}:5.95(2.95) $XK_{\alpha 1}$:5.414(14.7) $XK_{\alpha 2}$:5.405(7.43.1)	0.8402	^{56}Fe(d,α) ^{54}Fe(n,γ)
^{56}Mn	2.5789 h	ß— (100)	735.6(14.6) 1038(27.9) 2848.7(56.3)	846.764(98.8) 1810.72(27.6) 2113.09(14.8)	2.5215	^{55}Mn(n,γ)
^{52}Fe	8.275 h	EC(44.51) ß$^+$ (55.49)	804(55.49)	168.688(99) 377.748(1.64) $XK_{\alpha 1}$:5.898(7.44) γ±511(⩽110.98)	0.9322	^{50}Cr(α,2n)
^{55}Fe	2.737 y	EC (100)		XL:0.64(0.421) XK_{β}:6.49(3.29) $XK_{\alpha 1}$:5.89875(16.28) $XK_{\alpha 2}$:5.8876(8.24)	0.0058	^{54}Fe(n,γ)

^{59}Fe	44.495 d	ß⁻ (100)	130.4(1.31) 273.1(45.3) 465.4(53.1) 1564.7(0.18)	142.651(0.972) 192.349(2.918) 1099.245(56.59) 1291.59(43.2)	1.3062	^{58}Fe(n,γ)
^{55}Co	17.53 h	EC(24.1) ß⁺ (75.9)	285.3(0.0149) 1020.8(25.6) 1112.7(4.26) 1498(46)	477.2(20.2) 931.1(75) 1316.6(7.1) 1408.5(16.9) XK_{a1} :6.40384(4.38) γ±511(⩽151.79)	2.4272	^{54}Fe(d,n)
^{56}Co	77.23 d	EC(81) ß⁺ (19)	421(0.9) 584(0.017) 1458.9(18.1)	846.764(99.94) 1037.84(14.17) 1238.274(66.9) 1771.327(15.47) 2034.752(7.89) 2598.437(17.3) 3253.402(8.12) XK_{a1} :6.4(14.6) γ±511(⩽38.03)	3.7602	^{56}Fe(p,n)
^{57}Co	271.74 d	EC (100)		14.413(9.15) 122.06065(85.51) 136.473(10.71) $XK_{ß}$:7.06(6.68) XK_{a2}:6.39084(16.8) XK_{a1}:6.40384(33.1)	0.1439	^{56}Fe(d,n)
^{58}Co	70.86 d	EC(85.1) ß⁺(14.9)	474.6(14.9)	863.951(0.69) 1674.73(0.32) $XK_{ß}$:7.06(3.1) XK_{a2}:6.39084(7.79) XK_{a1}:6.40384(15.4) γ±511(⩽29.8)	0.9749	^{59}Co(n,2n) ^{58}Fe(p,n) ^{58}Ni(n,p) ^{55}Mn(α,n)
^{60}Co	5.2713 y	ß⁻ (100)	317.87(99.925) 664.81(0.011) 1491.11(0.057)	1173.228(99.85) 1332.492(99.9826)	2.6007	^{59}Co(n,γ)
^{57}Ni	55.6 h	EC(56.4) ß⁺ (43.6)	485(0.8) 737(7.04) 865(35.3)	127.164(16.7) 1224(0.063) 1730.44(0.052) 1757.55(5.75) XL:0.78(0.268) $XK_{ß}$:7.65(2.28) XK_{a2}:6.9153(5.69) XK_{a1}:6.93032(11.22) γ±511(⩽87.17)	2.0953	^{58}Ni(n,2n)
^{63}Ni	100.1 y	ß⁻ (100)	66.945(100)		0.0174	^{62}Ni(n,γ)

^{61}Cu	3.33 h	EC (38.5) ß$^+$ (61.5)	559.2(2.6) 932.2(5.5) 1147.8()2.3 1215.2(51)	67.412(4.2) 282.956(12.2) 656.008(10.8) 1185.234(3.7) XK$_{\alpha1}$:7.47815(8.4) γ$^{\pm}$511(⩽122.87)	1.1327	^{60}Ni(d,n)
^{62}Cu	9.67 m	EC (2.57) ß$^+$ (97.43)	878(0.077) 1754(0.135) 2927(97.2)	875.71 1173.02 XK$_{\alpha1}$:7.47815(0.47) γ$^{\pm}$511(⩽194.86)	2.2912	^{62}Ni(p,n)
^{64}Cu	12.7 h	EC (43.6) ß$^+$ (17.4) ß$^-$ (39)	653.09(17.4) 578.7(39)	XK$_{\alpha2}$:7.46086(4.76) XK$_{\alpha1}$:7.47815(9.36) γ$^{\pm}$511(⩽34.79)	0.3102	^{63}Cu(n,γ)
^{66}Cu	5.12 m	ß$^-$ (100)	1602.8(9.01) 2642(90.77)	833(0.22) 1039.2(9.23)	1.1642	^{65}Cu(nγ)
^{67}Cu	61.83 h	ß$^-$ (100)	182(1.1) 391(57) 483(22) 576(20)	91.266(7) 93.311(16.1) 184.577(48.7) XK$_{\alpha1}$:8.63886(3.8)	0.2657	^{65}Cu(t,p)
^{62}Zn	9.186 h	EC (91.6) ß$^+$ (8.4)	605(8.4)	40.85 507.6 548.35 596.56 XK$_{ß}$:8.91(5.1) XK$_{\alpha2}$:8.027(12.7) XK$_{\alpha1}$:8.047(24.9) γ$^{\pm}$511(⩽16.8)	0.4757	^{63}Cu(p,2n)
^{63}Zn	38.47 m	EC (7.3) ß$^+$ (92.7)	1383(4.9) 1675.5(7) 2345.1(80.3)	669.62(8.2) 962.02(6.5) XK$_{\alpha1}$:8.047(16.6) γ$^{\pm}$511(⩽185.49)		
^{65}Zn	244.06 d	EC (98.5) ß$^+$ (1.5)	328.8(1.403)	1115.539(50.6) XK$_{ß}$:8.91(4.61) XK$_{\alpha2}$:8.027(11.51) XK$_{\alpha1}$:8.047(22.6) γ$^{\pm}$511(⩽2.81)	0.5888	^{64}Zn(n,γ)
^{69m}Zn	13.76 h	IT		XK 8.638(1.26)	0.4388	^{68}Zn(n,γ)
^{69}Zn	56.4 m	ß$^-$ (100)	905(99.9986)	318.4(0.0012) 871.7(0.00025)	0.3216	^{68}Zn(n,γ)
^{66}Ga	9.49 h	EC (44) ß$^+$ (56)	362(0.97) 772(0.71) 924(3.81)	833.532(5.89) 1039.222(36.9) 2189.616(5.58) 2751.835(23.3)	3.4577	Cu(a,n)

			1781(0.326) 4153(50)	$XK_{\alpha1}$:8.638(11.21) $\gamma^{\pm}$511(112.01)		
^{67}Ga	3.2612 d	EC (100)		91.266(3.16) 93.311(39.2) 184.577(21.2) 208.951(2.4) 300.219(16.8) 393.529(4.68) XK_{β}:9.57(6.8) $XK_{\alpha2}$:8.61578(17) $XK_{\alpha1}$:8.63886(33.3)	0.1959	^{66}Zn(d,n) ^{67}Zn(p,n)
^{68}Ga	67.71 m	EC(10.9) β^{+} (89.1)	821.8(1.1) 1899.1(88)	578.53(0.032) 805.83(0.084) 1077.33(3) 1261.02(0.083) 1883(0.138) XK_{β}:9.57(0.553) $XK_{\alpha2}$:8.615(1.385) $XK_{\alpha1}$:8.63886(2.71) $\gamma^{\pm}$511(⩽178.2)	1.6866	^{68}Ge(EC)
^{70}Ga	21.14 m	β^{-} (99.59)	441(0.32) 617(0.36) 1656(98.91)	176.17 1039.2	0.6514	^{69}Ga(n,γ)
^{72}Ga	14.1 h	β^{-} (100)	659.3(15.0) 676.1(21.7) 965.5(27.7) 1486.3(8.9) 1936.1(2.99) 2537.1(8.5) 3167.1(10.3)	600.95(5.54) 629.96(24.8) 834.03(95.63) 894.25(9.88) 2201.66(25.9) 2507.79(12.78) $XK_{\alpha1}$:8.88642(0.161)	3.2131	^{71}Ga(n,γ)
^{68}Ge	270.95 d	EC(100)		XK_{β}:10.3(5.45) $XK_{\alpha2}$:9.22482(13.07) $XK_{\alpha1}$:9.25174(25.6)	0.0091	^{66}Zn(α,2n)
^{71}Ge	11.43 d	EC(100)		XK_{β}:10.3(5.52) $XK_{\alpha2}$:9.22482(13.24) $XK_{\alpha1}$:9.25174(25.9)	0.0092	^{70}Ge(n,γ)
^{75}Ge	82.78 m	β^{-} (100)	558.9(0.32) 707.8(0.225) 912(11.5) 978(0.86) 1176(87.1)	66(0.114) 198.6(1.19) 264.6(11.4) 419.1(0.185) 468.8(0.223) 617.7(0.114)	0.4558	^{74}Ge(n,γ)

^{77}Ge	11.3 h	ß⁻ (100)	701.9(8.0) 1141.3(7.12) 1512.2(18.5) 2070.2(20.5) 2226.5(15.3) 2486.5(5.3) 其他	211.03 (30.8) 215.5 (28.6) 264.44 (53.9) 367.4 (14) 416.33 (21.8) 558.02 (16.1) 194.8 (0.41) 215.53 (21) 1604.65 (0.21) 1676.46 (0.162) 其他	1.7280	^{76}Ge(n,γ)
^{72}As	26 h	EC(12.2) ß⁺ (87.8)	 1870(5.82) 2500(64.2) 2643(0.7) 3334(16.3)	629.92(7.92) 833.99(79.5) 1464(1.11) $XK_{α1}$: 9.886(3.31) γ±511(⩽175.68)	2.2840	^{72}Ge(p,n)
^{73}As	80.3 d	EC(100)		53.437(10.34) XL:1.19(1.9) $XK_{ß}$:11.0(13.3) $XK_{α1}$:9.85532(30.3) $XK_{α2}$: 9.88642(59.3)	0.0765	^{72}Ge(d,n)
^{74}As	17.77 d	EC(36.9) ß⁺ (29.1) ß⁻ (34)	944.5(26.1) 1540(3) 83.4(0.002) 718.2(15.4) 1353(18.6)	595.83(59) 608.43(0.552) 1204.35((0.285) $XK_{ß}$:11.0(2.23) $XK_{α1}$:9.855(5.1) $XK_{α2}$:9.886(10.0) γ±511(⩽58.22) 634.78(15.4) 635(0.0357)	0.7582	^{75}As(n,2n) ^{74}Se(n,P)
^{76}As	90.7 m	ß⁻ (100)	306.7(1.03) 532.9(1.69) 1174.3(1.77) 1745.8(7.5) 2402.9(35.2) 2962(51)	559.1(45) 563.23(1.2) 657.05(6.2) 1212.92(1.44) 1216.08(3.42) 1228.52(1.22)	1.4836	^{75}As(n,γ)
^{77}As	38.83 h	ß⁻ (100)	162.2(0.63) 433.1(0.63) 443.9(1.6) 682.9(97)	87.854(0.2) 161.932(0.146) 239.011(1.59) 249.805(0.39) 520.654(0.56)	0.2342	Ge(ß)
^{72}Se	8.4 d	EC(100)		46(58) XL 1.28(1.2)	0.0571	Ge(α,2n)

				XK_{β} 11.7(9.5) $XK_{\alpha1}$ 10.508(21.1) $XK_{\alpha2}$ 10.544(41)		
^{75}Se	119.779d	EC (100)		121.1155(17.2) 136(58.3) 264.6576(58.9) 279.5422(24.99) 400.6572(11.47) XK_{β}:11.73(7.34) $XK_{\alpha2}$:10.508(16.27) $XK_{\alpha1}$:10.5437(31.7)		$^{74}Se(n,\gamma)$
^{77}Br	57.036 h	EC(99.26) β^+ (0.74)	343(0.74)	238.98(23.1) 249.77(2.98) 297.23(4.16) 520.69(22.4) 578.91(2.96) XK_{β} 12.5(7.1) $XK_{\alpha1}$ 11.181(15.25) $XK_{\alpha2}$ 11.222(29.7) $\gamma^{\pm}$511(≤1.48)	0.3303	As((α,2n)
^{80}Br	17.68 m	EC(6.1) β^+ 2.2) β^- (91.7)	849.1(2.2) 745(0.31) 1384(6.2) 2001(85)	665.8(1.08) K_{β} 12.5(0.436) $XK_{\alpha1}$ 11.181(0.94) $XK_{\alpha2}$ 11.222(1.82) $\gamma^{\pm}$511(≤4.4) 616.3(6.7) 639.4(0.26) 703.8(0.19)	0.0761	$^{79}Br(n,\gamma)$
^{82}Br	35.30 h	β^- (100)	264.5(1.3) 444.2(98.5) 536.4(0.25) 1272.1(0.2) 1617.7(0.2) 2316.1(0.4)	554.348(70.8) 619.106(43.4) 698.374(28.5) 776.517(83.5) 827.828(24.0) 1044.002(27.2) 1317.473(26.5) 1474.88(16.32)	2.7844	$^{81}Br(n,\gamma)$
^{79}Kr	35.04 h	EC(93) β^+ (7)	206(0.021) 297(0.005) 342(0.18) 604(6.8)	261.29(12.7) 397.54(9.3) 606.09(8.1) XK_{β} 13.3(7.18) $XK_{\alpha1}$ 11.877(14.97) $XK_{\alpha2}$ 11.824(29.1) $\gamma^{\pm}$511(≤14.01)	0.2786	$^{78}Kr(n,\gamma)$
^{83m}Kr	1.83 h	IT(100)		9.369190.46(64)	0.0416	$^{83}Br(\beta^-)$

				357.39(0.76) 446.15(23.2) 456.73(3.02) 510.4(5.3) 537.6(2.23) XL 1.59(1.5) XK_{β} 14.1(8.2) $XK_{\alpha2}$ 12.598(16.7) (4.9) XL 1.59(2.2) XK_{β} 14.1(2.53) $XK_{\alpha2}$ 12.598(5.1) $XK_{\alpha1}$ 12.649(9.9)		
^{85}Kr	10.756 y 4.48 h	ß⁻ (100) IT(21.4) ß⁻ (78.6)	173.4)0.434) 687.4(99.563) 841.1(78.3)	513.997(0.43) $XK_{\alpha1}$:13.39(0.00103) 304.87(14) $XK_{\alpha2}$:12.598(1.16) $XK_{\alpha1}$:12.649(2.25) 151.2(75)	0.2529	U(n,f)
^{81}Rb	4.576 h	EC(72.9) ß⁺ (27.1)	 221(0.0086) 295(0.00187) 514(0.28) 578(1.77) 1024(25) 1215(0.06)	$XK_{\alpha1}$12.649(32.3) γ±511(⩽54.28)	0.6304	^{79}Br(a,2n)
^{83}Rb	86.2 d	EC(100)		520.389(45) 529.59(29.3) 552.588(16) $XK_{\alpha1}$ 12.649(32)	0.4997	^{81}Br(a,2n)
^{84}Rb	32.77 d	EC(70.5) ß⁺ (25.7) ß⁻ (3.8)	 777.3(12.6) 1658.9(13.1) 894(4)	881.604(69) $XK_{\alpha1}$:12.649(22.1) γ±511(⩽51.42)	1.0710	^{81}Br(a,n)
^{86}Rb	18.642 d 1.017 m	ß⁻ (99.99) EC(0.01) IT(100)	697.2(8.64) 1774.2(91.36)	1077(8.64) $XK_{\alpha1}$:12.649(0.0016) 556.07(98.17) $XK_{\alpha1}$:13.395(0.583)	0.7610	^{85}Rb(n,γ)
^{87}Rb	4.923E+10 y	ß⁻ (100)	282.3(100)		0.1154	天然
^{88}Rb	17.78 m	ß⁻ (100)	802(2.13) 2582(13.3) 3480(4.1)	898.03(14) 1836(21.4) 2677.892(1.96)	2.7089	^{87}Rb(n,γ)

			5316(78)	$XK_{\alpha1}$ 14.165(0.00155)		
^{82}Sr	25.36 d	EC(100)		XL: 1.69(1.6) XK_{β} :15(8.48) $XK_{\alpha1}$:13.335(16.71) $XK_{\alpha2}$:13.395(32.3	0.0132	^{85}Rb(p,4n)
^{85}Sr	64.84 d	EC (100)		514.004(96) $XK_{\alpha2}$:13.3358(17.1) $XK_{\alpha1}$:13.395.3(33)	0.5090	^{84}Sr(n,γ)
^{89}Sr	50.53 d	β^- (100)	586.1(0.00964) 1495.1(99.990)	908.96(0.00956) 其他	0.5846	^{88}Sr(n,γ)
^{90}Sr	28.79 y	β^- (100)	546(100)		0.1957	U(n,f)
^{87}Y	79.8 h	EC(99.8) β^+ (0.2)	450.5(0.184)	388.531(82.1) 484.805(89.7) XK_{β} :15.8(10.64) $XK_{\alpha1}$:14.0979(20.51) $XK_{\alpha2}$:14.165(39.6) γ≠511(≤0.37)	0.4534	
^{88}Y	106.65 d	EC (99.79) β^+ (0.24)	764.5(0.208)	898.036(93.9) 1836.052(99.32) 2734(0.71) XK_{β}:15.8(9.05) $XK_{\alpha2}$:14.0979(17.46) $XK_{\alpha1}$:14.165(33.69) γ≠511(≤0.42)	2.7017	^{88}Sr(p,n)
^{90}Y	64.1h	β^- (100)	519.4(0.0115) 2280.1(99.988)		0.9931	^{89}Y(n,γ) $^{90}Sr(\beta^-)$
^{91}Y	58.51 d	β^- (100)	340(0.26) 1544.8(99.74)	1204(0.26)	0.6063	U(n,f)
^{95}Zr	64.032 d	β^- (100)	367.8(54.53) 400.3(44.24) 888.8(1.13) 1124.5(0.103)	235.69(0.294) 724.193(44.27) 756.73(54.38) $XK_{\alpha2}$:16.521(0.166) $XK_{\alpha1}$:16.615(0.319)	0.8506	^{94}Zr(n,γ) U(n,f)
^{97}Zr	16.744 h	β^- (100)	410.8(0.38) 552.4(4.94) 893.9(1.18) 907.9(0.46) 1109.9(0.37) 1407.3(3.9) 1914.9(87.8)	355.4(2.09) 507.64(5.03) 743.36(93.06) 1147.97(2.61) XK_{β}:18.6(0.203) $XK_{\alpha2}$:16.521(0.368) $XK_{\alpha1}$:16.615(0.707)	1.6004	^{96}Zr(n,γ)
^{90}Nb	14.6 h	EC(48.8) β^+ (51.2)	714(0.0104) 770(0.0094)	141.178(66.8) 1129.224(92.7) 2186.24(17.96)	4.6167	^{90}Zr(p,n)

			857(0.031) 1500(51.1)	2318.96(82) XK_{β}:17.7(7.5) $XK_{\alpha 2}$:15.6909(13.9) $XK_{\alpha 1}$:15.7751(26.7) γ±511(⩽102.31)		
^{95}Nb	34.991 d	ß⁻ (100)	159.8(99.97) 721.5(0.017) 925.6(0.03)	204.12(0.028) 561.88(0.013) 765.803(99.81) 其他	0.8091	^{96}Zr(p,2n) 裂变
^{99}Mo	65.94 h	ß⁻ (100)	215.3(0.105) 228.1(0.01) 353.1(0.14) 436.6(16.4) 685.7(0.044) 848.1(1.14) 1214.5(82.4)	40.5835(1.02) 140.511(89.6) 181.068(6.01) 366.421(1.194) 739.5(12.12) 777.921(4.26) $XK_{\alpha 1}$:18.3671(2)	0.5413	^{98}Mo(n,γ) 裂变
^{99m}Tc	6.015 h	IT (100)		140.511(88.5) 142.03(0.0187) XL: 2.42(0.48) XK_{β} :20.6(1.2) $XK_{\alpha 1}$:18.25(2.1) $XK_{\alpha 2}$:18.367(4.02)	0.1428	^{99}Mo (ß⁻)
^{99}Tc	2.111E+5 y	ß⁻ (100)	204(0.0016) 293.5(99.9984)	很弱		裂变
^{103}Ru	39.26 d	ß⁻ (100)	114(0.091) 116(6.61) 159(0.0015) 229(92.2) 471(0.243) 766(0.87)	497.084(91) 557.04(0.868) 610.33(5.76) XL 2.7(4.2) XK_{β}:22.7(1.52) $XK_{\alpha 2}$:20.737(2.6) $XK_{\alpha 1}$:20.216(4.9)	0.5622	^{102}Ru(n,γ)
^{105}Ru	4.44 h	ß⁻ (100)	539(1.63) 571(3.52) 947(3.98) 1110(18.8) 1130(16.9) 1192(47.8) 1447(2.1) 1786(2.6)	129.782(5.68) 262.83(6.47) 316.44(11.1) 469.37(17.5) 676.36(15.7) 724.3(47.3) XK_{β}:22.7(2.09) $XK_{\alpha 1}$:20.216(6.7)	1.1886	^{104}Ru(n,γ)
^{106}Ru	373.59 d	ß⁻ (100)	39.4(100)		0.0100	裂变
^{105}Rh	35.36 h	ß⁻ (100)	123(0.042) 247(19.7) 260(5.2) 566(75)	280(0.166) 306.1(5.1) 318.9(19.1) 442.8(0.042)	0.2306	^{105}Ru(d,2n)

				XK_{a1}:21.177(0.223)		
^{103}Pd	16.991 d	EC (100)		39.748(0.0683) 357.45(0.0221) XK_{a1}:20.216(41.93)	0.0204	$^{102}Pd(n,\gamma)$ $^{103}Rh(p,n)$
^{109}Pd	13.7012 h 4.696 m	ß⁻ (100) IT(100)	246.4(0.018) 380.6(0.032) 391.5(0.021) 804.5(0.02) 1027.9(99.9)	88.04(3.6) 311.4(0.032) 415.2(0.0107) 636.3(0.01) 647.3(0.02440 781.4(0.01120 XK_{a1}:22.16(18.7) 188.9(55.9) XK_{a1}:21.177(14.3)	0.0118	$^{108}Pd(n,\gamma)$
^{105}Ag	41.29 d	EC(100)		63.98(10.5) 280.44(30.2) 319.16(4.35) 331.51(4.1) 344.52(41.4) 443.37(10.5) 844.55)(11.1) 650.52(2.54) 1087.94(3.85) XK_{a1}:21.177(44.7)	0.5330	$^{103}Rh(a,2n)$
^{110}Ag	24.6 s	ß⁻ (99.7) EC(0.3)	1109.3(0.012) 1419.7(0.038) 2235.2(4.41) 2892.7(94.91)	657.5(4.5)	1.2119	$^{109}Ag(n,\gamma)$
^{110m}Ag	249.76d	ß⁻ (98.64) IT(1.36)	83.5(66.8) 133.5(0.41) 530.3(30.45) 1467.8(0.3)	657.76(94.38) 677.6217(10.56) 706.676(16.48) 763.94(22.31) 884.678(74) 937.483(34.51) 1384.3(24.7) 1505(13.16) 1.113(1.36)	2.8363	$^{109}Ag(n,\gamma)$
^{111}Ag	7.45 d	ß⁻ (100)	694.7(7.1) 791.4(1) 1036.8(92)	96.75(0.116) 245.4(1.33) 342.13(6.7) XK_{a1}:23.1736(0.103)	0.3804	$^{110}Pd(d,n)$
^{109}Cd	461.4 d	EC (100)		88.033(3.7) XL:2.98(11.2) $XK_{ß}$:24.9(17.8) XK_{a2}:21.99(29.13)	0.1092	$^{108}Cd(n,\gamma)$

	10.9 μs 12 μs	IT(100) IT(100)		$XK_{\alpha1}$:22.162.9(55.2) 203.5(93.8) 259.5(85.9) XK_{β}:26.1(2.57) $XK_{\alpha2}$:22.984(4.16) $XK_{\alpha1}$:23.1736(7.85) 59.5(9.5) XK_{β}:26.1(8.1) $XK_{\alpha2}$:22.984(13.1) $XK_{\alpha1}$:23.1736(24.6)		
^{115}Cd	53.46 h	β^- (100)	253(0.013) 582(33.1) 617(3.3) 849(1.16) 1110(62.6)	260.896(1.94) 336.24(45.9) 492.351(8.03) 527.901(27.4) $XK_{\alpha1}$:24.209(20)	0.5107	^{114}Cd(n,γ)
^{117}Cd	2.49 h	β^- (100)	213(6.2) 503(2.2) 528(8.2) 633(32) 812(3.4) 1776(13.2) 1936(3.7) 2210(21)	89.73(3.26) 273.349(27.9) 344.459(17.9) 434.19(9.8) 880.71(3.96) 1051.7(3.79) 1303.27(18.4) 1576.62(11.2) $XK_{\alpha1}$:24.209(2.94)	1.5175	^{116}Cd(n,γ)
^{111}In	2.8047d	EC(100)		150.81(0.00282) 171.28(90.66) 245.4(94.09) XL 3.13(6.9) XK_{β}:26.1(14.5) $XK_{\alpha2}$:22.9841(23.5) $XK_{\alpha1}$:23.1736(44.3)	0.4409	^{109}Ag(α,2n) ^{111}Cd(p,n)
^{113m}In	1.6579 h	IT(100)		391.(64.23)	0.3967	^{113}Sn (EC)
^{114m}In	49.51 d	EC(3.25) IT(96.75) IT(100)		558.43(3.2) 725.24(3.2) $XK_{\alpha1}$:23.1736(1.18) 190.27(15.56) $XK_{\alpha1}$:24.2097(18.3) 190.34(15.05) 311.652(86.6) $XK_{\alpha1}$:24.2097(3.501)	0.2254	^{113}In(n,γ)
^{114}In	71.9 s	EC(0.495) β^+ (0.005) β^- (99.5)	 431(0.0032) 688.8(0.14)	558.43(0.03) $XK_{\alpha1}$:23.173(0.19) γ±511(⩽0.01 1299.83(0.139)	0.7764	^{113}In(n,γ)

			1988.7(99.36)			
^{116m}In	54.41 m	ß⁻ (100)	305(0.33) 355(2.71) 600(10.2) 872(33.8) 1010(52.1)	138.326(3.29) 416.86(27.7) 818.7(11.5) 1097.3(56.2) 1293.54(84.4) 1507.4(10) 2112(15.5) XK_{a1}:25.271(0.513)	2.7819	^{115}In(n,γ)
^{117m}In	116.2 m	ß⁻ (52.9)	750(0.011) 1612(9.7) 1770(18.3)	158.6(15.9) 861.6(0.019) XK_{a1}:25.271(0.99)	0.5254	^{117}Cd(ß⁻)
^{117}In	43.2 m	ß⁻ (100)	743(99.83) 1140(0.17)	158.6(87) 552.9(100) XK_{a1}:25.2713(5.4)	0.9612	^{117}Cd(ß⁻)
^{113}Sn	115.09 d 21.4 m	EC(100) EC (8.9) IT(91.1)		255.134(2.11) 391.698(64.97) XL:3.29(9.1) $XK_{ß}$:27.3(17.3) XK_{a2}:24.(27.62) XK_{a1}:24.2097(52) $XK_{ß}$:27.3(1.2) XK_{a2}:24.002(1.9) XK_{a1}:24.2097(3.5) 77(0.501) XK_{a1}:25.2713(23.8)	0.0300	^{112}Sn (n,γ)
^{121}Sn	27.03 h	ß⁻ (100)	388.9(100)		0.1156	^{120}Sn (n,γ)
^{123}Sn	129.2 d	ß⁻ (100)	1403(99.37)	1088.64(0.6)	0.5296	^{122}Sn (n,γ)
^{122}Sb						
^{124}Sb	60.2 d	ß⁻ (100)	210.8(8.86) 610.8(51.9) 865.2(3.87) 1579(4.78) 1655.9(2.57) 2301.8((22.3)	602.73(98.3) 645.85(7.46) 722.78(10.81) 1690.97(47.79) 2090.93(5.51) XK_{a1}:27.4723(0.214)	2.2362	^{123}Sb (n,γ)
^{125}Sb	2.75856 y	ß⁻ (100)	95.3(13.5) 124.5(5.79) 130.6(18) 241.5(1.619) 303.3(40.6) 445.6(7.23) 621.9(13.6)	35.49(4.5) 176.3(6.89) 427.874(29.8) 463.365(10.56) 600.597(17.77) 606.713(5.02) 635.95(11.29) XK_{a1}:27.4723(26.1)	0.5383	Sn (ß⁻)
^{127}Te	9.35 h	ß⁻ (100)	280(1.19)	360.3(0.135)	0.2294	^{126}Te(n,γ)

			495(0.027) 698(98.79)	417.9(0.99) $XK_{\alpha1}$:28.612(0.057)		
^{129m}Te	33.6 d	β⁻ (37) IT(63)	202(0.41) 874(1.9) 908(8) 1603(86)	556.65(0.12) 695.88(3.1) 729.57(0.7) 105.5(0.15) $XK_{\alpha1}$:27.472(15)	0.3085	^{128}Te(n,γ)
^{129}Te	69.6 m	β⁻ (100)	386(0.88) 668(0.213) 938(0.252) 1011(9.3) 1220(0.56) 1470(89)	27.81(16.3) 278.43(0.57) 459.6(7.7) 487.39(1.42) 1083.85(0.49) XL:3.94(6.2)	0.6061	^{129m}Te (IT)
^{131}Te	30 h 25 m	β⁻ (77.8) IT(22.2) β⁻ (100)	301(1.71) 404(2.33) 414(5.6) 435(37.6) 491(2.21) 516(16.9) 769(2.6) 2415(3) 732(1.197) 789(1.176) 806(1.34) 1086(9.96) 1135(2.58) 1356(1.175) 1631(21.69) 2083(59.3)	102.06(8.1) 334.27(9.7) 773.67(38.6) 793.75(14.1) 852.21(21) 1125.46(11.6) 1206.6(9.9) $XK_{\alpha1}$:28.612(5.5) 182.25(0.85) XK_{β}:31(2.32) $XK_{\alpha1}$:27.472(6.7) 149.716(68.8) 452.323(18.2) 492.66(4.83) 602.039(4.19) 948.542(2.26) 997.25(3.337) 1146.96(4.95) $XK_{\alpha1}$:28.612(6.87)	1.1322	^{131}Te(n,γ)
^{132}Te	3.204 d	β⁻ (100)	215(100)	49.72(15) 228.16(88) XK_{β}:32.3(13.5) $XK_{\alpha1}$:28.612(38.5)	0.3453	裂变
^{121}I	2.12 h	EC(89.7) β⁺ (10.3)	 662(0.0134) 725(0.25) 1045(10)	212.2(84.3) 475.28(1.02) 532.08(6.1) 598.74(1.47) $XK_{\alpha1}$:27.4723(39.3) γ±511(≤20.6	0.4660	^{122}Te(d,3n)

^{123}I	13.27 h	EC (100)		158.97(83.3) 346.35(0.126) 440(0.428) 505.33(0.316) 528.96(1.39) 538.54(0.382) $XK_{\alpha1}$:27.4723(46)	0.2012	^{121}Sb(a,2n) ^{123}Te(p,n)
^{124}I	4.176 d	EC(77) β^+ (23)	812.1(0.301) 1534.9(11.79) 2137.6(10.89)	602.72(62.9) 722.78(10.35) 1325.5(1.561) 1376(1.75) 1509.49(3.13) 1691.02(10.88) $XK_{\alpha1}$:27.472(30.9) $\gamma^{\pm}$511(⩽45.96)	1.3075	^{124}Sb(a,n)
^{125}I	59.4 d	EC (100)		35.492(6.67) XL:3.77(15.5) XK_{β}:31(25.9) $XK_{\alpha2}$:27.201(39.9) $XK_{\alpha1}$:27.472(74.5)	0.0621	^{123}Sb(a,2n) ^{124}Xe(n,γ) ^{125}Xe (ε)
^{126}I	12.93 d	EC(55.4) β^+ (1.16) β^- (43.7)	468(0.203) 1134(0.96) 371(3.6) 862(32.1) 1251(8)	666.321(33.1) 753.819(4.2) 1420.19(0.295) XL:3.77(4.5) XK_{β}:31(7.7) $XK_{\alpha2}$:27.2(11.9) $XK_{\alpha1}$:27.472(22.2) $\gamma^{\pm}$511(⩽2.32) 388.633((34) 491.243(2.85) 879.876(0.75) $XK_{\alpha1}$:29.779(0.248)	0.5959	^{123}Sb(a,n)
^{128}I	24.99 m	EC(6.895) β^+(0.005) β^- (93.1)	230(0.0026) 536(0.0136) 1150(2) 1676(15.4) 2119(75.7)	743.5(o.17) $XK_{\alpha1}$:27.472(2.8) $\gamma^{\pm}$511(⩽0.01) 442.901(16.9) 526.557(1.58) 969.458(0.4) $XK_{\alpha1}$:29.779(0.089)	0.8139	^{127}I(n,γ)
^{129}I	1.57E+7 y	β^- (100)	154(100)	39.578(7.51) XL:4.11(8.2) XK_{β}:33.6(13.2) $XK_{\alpha2}$:29.458(19.9)	0.0902	裂变

				$XK_{\alpha1}$:29.779(37)		
^{130}I	12.36 h	β^- (100)	375(0.49) 622(46.7) 812(2.14) 1040(48) 1176(1.43) 1779(0.4)	418.01(34.2) 536.09(99) 668.54(96) 739.48(82) 1157.47(11.3) $XK_{\alpha1}$:29.779(0.796)	2.4158	$^{129}I(n,\gamma)$
^{131}I	8.0207 d	β^- (100)	247.9(2.1) 303.9(0.651) 333.8(7.27) 606.3(89.9) 629.7(0.05) 806.9(0.48)	80.185(2.62) 284.305(6.14) 364.489(81.7) 636.989(7.17) 722.911(1.77) $XK_{\alpha1}$:29.779(2.56)	0.5746	裂变 ^{131}Te (ß)
^{132}I	2.295 h	β^- (100)	645(0.7) 689(0.75) 740(1.45) 741(13) 910(3.6) 967(8.2) 991(2.9) 996(3.2) 1155(2.5) 1185(18.8) 1470(9) 1617(12.6) 2140(19)	505.79(4.94) 522.65(16) 630.19(13.3) 667.718(98.7) 669.8(4.6) 671.4(3.5) 727.2(3.2) 772.6(75.6) 812(5.5) 954.55(17.6) 1298.57(7.01) $XK_{\alpha1}$:29.779(0.553)	2.7575	^{132}Te (ß)
^{133}I	20.8 h	β^- (100)	385(1.26) 473(3.8) 535(3.2) 719(0.63) 896(4.2) 1027(1.83) 1241(83) 1538(1.04)	510.53(1.83) 529.872(87) 706.578(1.51) 856.278(1.24) 875.329(4.51) 1236.441(1.51) 1298.223(2.35) $XK_{\alpha1}$:29.779(0.35)	1.0262	裂变
^{131m}Xe	11.84 d	IT(100)		163.93(1.95) $XK_{\alpha1}$:29.779(28.6)	0.1676	$^{131}Xe(n,\gamma)$
^{133m}Xe	2.19 d	IT(100)		233.22(10) $XK_{\alpha1}$:29.779(29.8)	0.2333	$^{132}Xe(n,\gamma)$
^{133}Xe	5.243 d	β^- (100)	43.5(0.0076) 266.8(0.81) 346.4(99)	79.623(0.27) 80.997(38) XK_{β}:35(9.4) $XK_{\alpha1}$:30.972(26.2)	0.1854	$^{132}Xe(n,\gamma)$ ^{133m}Xe (IT) U(n,f)
^{129}Cs	32.06 h	EC(100)		39.278(2.97) 318.18(2.45)	0.2977	$^{127}I(\alpha,2n)$

				371.918(30.6) 411.49(22.3) 548.945(3.4) $XK_{\alpha1}$:29.779(55.1)		
^{130}Cs	29.21 m	EC(53.2) β^+ (45.2) β^- (1.6)	1463(0.62) 2000(44.6) 439(1.6)	536.1(3.8) 586.1(0.47) 894.5(0.39) 1615(0.26) $XK_{\alpha1}$:29.779(21.4) $\gamma^{\pm}$511(⩽90.45)	0.8894	$^{127}I(\alpha,n)$
^{131}Cs	9.689 d	EC (100)		XL:4.11(9) XK_{β}:33.6(13.9) $XK_{\alpha2}$:29.458(21.1) $XK_{\alpha1}$:29.779(39.13)	0.0295	$^{130}Ba(n,\gamma)$ $^{131}Ba(EC)$
^{132}Cs	6.479 d	EC(97.7) β^+ (0.43) β^- (1.87)	440(0.43) 262(0.36) 829(1.51)	505.79(0.73) 630.19(0.95) 667.714(97.52) 1136(0.476) 1317.916(0.585) $XK_{\alpha1}$:29.779(39.22) $\gamma^{\pm}$511(⩽0.86) 464.47(1.73) 567.16(0.234) 1031.66(0.125)	0.7151	$^{133}Cs(n,2n)$
^{134m}Cs	2.903 h	IT(100)		11.24(1.1) 127.5(12.6) $XK_{\alpha1}$:30.973(16.6)	0.1394	$^{133}Cs(n,\gamma)$
^{134}Cs	2.0648 y	β^- (100)	88.6(27.28) 415.2(2.506) 657.9(70.23) 890.5(0.045) 1453.8(0.008)	563.246(8.35) 569.331(15.38) 604.721(97.62) 795.864(85.53) 801.953(8.69) 1365.185(3.104) $XK_{\alpha1}$:32.1936(0.441)	1.7190	$^{133}Cs(n,\gamma)$
^{135}Cs						
^{137}Cs	30.1671 y	β^- (100)	513.97(94.4) 892.13(0.00058) 1175.63(5.6)	661.657(84.99) XL:4.47(1) XK_{β}:36.4(1.32) $XK_{\alpha2}$:31.817(1.96) $XK_{\alpha1}$:32.1936(3.62)	0.1884	裂变
^{131m}Ba	14.6 m	IT(100)		79.05(1.3) 108.45(55.44) XL:4.47(14)	0.1875	$^{130}Ba(n,\gamma)$

				$XK_{\alpha1}$:32.1936(24.95)		
^{131}Ba	11.5 d	EC (100)		123.805(29) 133.609(2.12) 216.078(19.66) 239.629(2.41) 249.432(2.81) 373.246(14.04) 486.522(2.09) 496.326(46.8) XK_{β}:35(18.4) $XK_{\alpha2}$:30.625(27.74) $XK_{\alpha1}$:30.973(51.4)	0.5219	$^{130}Ba(n,\gamma)$
^{133}Ba	10.52 y	EC(100)		53.162(2.14) 79.614(2.65) 80.998(32.9) 276.398(7.16) 302.851(18.34) 356.0129(62.05) 303.848(8.94) XK_{β}:35(22.4) $XK_{\alpha2}$:30.625(33.7) $XK_{\alpha1}$:30.9728(62.5)	0.4588	$^{132}Ba(n,\gamma)$
^{139}Ba	83.06 m	β^-(100)	889(0.287) 2144(29.7) 2310(70)	165.864(24) 1420.5(0.26) $XK_{\alpha1}$:33.441(2.4)	0.9470	$^{138}Ba(n,\gamma)$
^{140}Ba	12.752 d	β^-(100)	466(23.8) 579(9.3) 884(4.4) 1003(38) 1017(24)	13.846(1.22) 29.966(14.1) 162.66(6.22) 304.849(4.29) 423.722(3.15) 437.575(1.929) 537.261(24.39) $XK_{\alpha1}$:33.4418(0.813) XL:4.65(15)	0.5029	裂变
^{140}La	1.6781 d	β^-(100)	1240.5(10.9) 1246.1(5.68) 1281(1.07) 1297.8(5.45) 1349.9(44) 1414(4.93) 1678.6(19.2) 2165.7(4.8)	328.762(20.3) 487.021(45.5) 751.637(4..33) 815.772(23.28) 867.846(5.5) 925.189(6.9) 1596.21(95.4) 2521.4(3.46) $XK_{\alpha1}$:34.7197(0.95)	2.8429	$^{139}La(n,\gamma)$
^{139}Ce	137.641 d	EC(100)		165.857(79.9)	0.1954	$^{138}Ce(n,\gamma)$

				XK_{β}:37.8(15.7) $XK_{\alpha 2}$:33.034(23.2) $XK_{\alpha 1}$:33.441(42.7)		$^{139}La(p,n)$
^{141}Ce	32.508 d	β^- (100)	435.9(70.2) 581.3(29.8)	145.44(48.3) $XK_{\alpha 1}$:36.0263(8.9)	0.2478	$^{140}Ce(n,\gamma)$
^{143}Ce	33.039 h	β^- (100)	301(0.46) 401.4(0.175) 523.8(1.36) 739.7(13.2) 971.2(0.26) 1111(48.3) 1404.2(35) 1461.6(0.1)	57.356(11.7) 231.55(2.05) 293.266(42.8) 350.619(3.23) 490.368(2.16) 664.571(5.69) 721.929(5.39) 880.46(1.031) $XK_{\alpha 1}$:36.0263(32.3)	0.7159	$^{142}Ce(n,\gamma)$
^{144}Ce	284.91 d	β^- (100)	185.1(19.6) 238.5(3.9) 318.6(76.5)	33.568(0.2) 40.98(0.257) 53.395(0.1) 80.12(1.36) 133.515(11.09) $XK_{\alpha 1}$:36.0263(4.53)	0.0194	裂变
^{142}Pr	19.12 h	β^- (99.98) EC(0.02)	76(0.023) 584.8(3.7) 2160.4(96.3)	508.8(0.023) 1575.6(3.7) 642(0.00221) $XK_{\alpha 1}$:34.7197(0.0063)	0.8679	$^{141}Pr(n,\gamma)$
^{143}Pr	13.57 d	β^- (100)	933.9(100)	很弱	0.3150	裂变
^{147}Nd	10.98 d	β^- (100)	209.4(2.2) 364.3(15.3) 406(0.8) 484.8(0.6) 804.2(81)	91.105(27.9) 319.411(1.95) 439.895(1.2) 531.016(13.1) $XK_{\alpha 1}$:38.724(23.5)	0.4109	$^{146}Nd(n,\gamma)$
^{149}Nd	1.728 h	β^- (100)	946(1.11) 1036(19.1) 1153(21.5) 1229(1.2) 1294(3.31) 1421(17.5) 1480(24.7) 1502(1.4) 1577(6)	114.314(19.2) 155.873(5.9) 211.309(25.9) 267.693(6) 270.166(10.7) 423.553(7.4) 540.509(6.6) 654.831(8) $XK_{\alpha 1}$:38.724(16.6)	0.8756	$^{148}Nd(n,\gamma)$
^{151}Nd	12.44 m	β^- (100)	1144(17.9) 1309(3.9) 1528(8.7) 1589(9.6)	116,8(39) 138.89(7) 175.07(6.3) 255.68(14.8)	1.4712	$^{146}Nd(n,\gamma)$

			1601(4.4) 2117(3.9) 2186(7.5) 2442(14.6)	423.56(5.9) 736.23(5.9) 1180.89(13.3) $XK_{\alpha1}$:38.724(9.5)		
^{147}Pm	2.6234 y	β^- (100)	224.6(99.994)	很弱	0.0619	裂变
^{149}Pm	53.08 h	β^- (100)	189(0.136) 785(3.4) 1048(24) 1071(95.9)	285.95(3.1) 859.46(0.19) $XK_{\alpha1}$:40.118(0.12) XL:5.64(0.14)	0.3769	裂变
^{145}Sm	340 d	EC (100)		61.22(12.15) XK_{β}:43.8(27.5) $XK_{\alpha2}$:38.171(39.4) $XK_{\alpha1}$:38.724(71.6)	0.0950	$^{144}Sm(n,\gamma)$
^{151}Sm	90 y	β^- (100)	55.2(0.91) 76.7(99.09)	21.543(0.0314)	0.0200	$^{150}m(n,\gamma)$
^{153}Sm	46.5 h	β^- (100)	95.1(0.0154) 101.6(0.0256) 114(0.025) 171.7(0.07) 173.5(0.065) 635.3(32.2) 656.6(0.036) 705(49.6) 710.8(0.41) 808.2(17.5)	69.673(4.85) 75.422(0.346) 83.36716(0.185) 89.48595(0.167) 97.431(0.846) 103.18011(29.8) XL:5.85(11.8) XK_{β}:47(12.3) $XK_{\alpha2}$:40.9019(17.4) $XK_{\alpha1}$:41.5422(31.4)	0.3341	$^{152}m(n,\gamma)$
^{152m}Eu	9.3116 h 96 m	EC(27.99) $^{+}\beta$ (0.07) β^- (72.1) IT(100)	897.9 (0.0064) 549.7(1.59) 816.5(0.123) 1520.1(1.7) 1864.4(69.6)	121.777(7) 562.93(0.22) 841.594(14.2) 961.06(0.198) 963.39(11.7) 1389(0.75) $XK_{\alpha1}$:40.118(11) $\gamma^{\pm}$511(≤0.01) 344.31(2.4) 970.35(0.59) 1314.67(0.93) $XK_{\alpha1}$:40.996(0.054) 12.598(0.29) 18.21(1.26) 77.23(0.69) 89.847(69.9) $XK_{\alpha1}$:41.5422(11.8) XL:5.85(27)	0.8023	$^{151}Eu(n,\gamma)$
^{152}Eu	13.537 y	EC (72.1)		121.782(28.41)	1.2045	$^{152}Eu(n,\gamma)$

		$^{+}$ß (0.014) ß$^{-}$ (27.9)	485.8(0.0028) 730.5(0.011) 175.4(1.82) 384.8(2.43) 695.6(13.78) 1063.4(0.9) 1474.5(8.1)	244.698(7.55) 867.38(4.241) 964.079(14.49) 1085.837(10.13) 1112.076(13.4) 1408.013(20.84) XK_{a1}:40.1181(28.36) γ$^{\pm}$511(⩽0.03) 344.28(26.5) 411.12(2.234) 778.9(12.94) 1086.74(1.727) 1299.14(1.623)		
^{154}Eu	8.593 y	ß$^{-}$ (99.98)	248.8(28.6) 307.5(0.851) 351.3(1.64) 570.9(36.3) 704.6(0.707) 840.6(16.8) 972.1(3.5) 1152.9((0.7) 1845.3(10)	123.07(40.6) 247.93(6.91) 591.76(4.96) 723.3(20.11) 756.8(4.54) 873.19(12.2) 996.262(10.53) 1004.725(17.91) 1274.43(35) XK_{a1}:42.9962(13.3)	1.5223	^{153}Eu(n,γ)
^{155}Eu	4.7611 y	ß$^{-}$ (100)	106.1(0.72) 134.2(2.3) 146.9(47) 165.7(25) 192.2(8.1) 252.2(17.6)	26.532(0.316) 45.2972(1.33) 60.008(1.13) 86.062(0.15) 86.545(30.7) 105.305(21.2) XK_{a1}:42.996(11.8)	0.1259	^{155}Sm(ß$^{-}$)
^{153}Gd	240.4 d 76 μs	EC (100) IT(100)		69.67(2.42) 83.37(0.196) 97.431(29) 103.18(21.1) XK_{a1}:41.542(62.9) 1.83(30.6) 2.8(52) 41.56(9) 51.78(4.5) 75.07(4) 76.01(19) XK_{a1}:42.996(0.18)	0.1494	^{152}Gd(n,γ)
^{159}Gd	18.479 d	ß$^{-}$ (100)	607.1(12) 622.3(0.31)	57.999(2.2) 226.04(0.22)	0.3635	^{158}Gd(n,γ)

			912.6(26) 970.6(62)	348.2807(0.23) 363.543(11) XK_{a1}:44.4816(9.5)		
^{160}Tb	72.3 d	β^- (100)	436.4(4.47) 476.6(9.91) 548.6(3.43) 570.5(45.4) 786.2(6.49) 869.1(28)	86.79(13.2) 298.58(26.1) 879.38(30.1) 962.311(9.81) 966.166(25.1) 1177.95(14.9) XK_{a1}:45.998(10.9)	1.3856	^{159}Tb(n,γ)
^{161}Tb	6.906 d	β^- (100)	460.3(26) 517.5(66) 566.4(5) 592.1(5)	25.6514(23.2) 48.91553(17) 57.192(1.79) 74.56669(10.2) XK_{a1}:45.998(11.6)	0.2390	^{161}Gd(d,x)
^{157}Dy	8.14 h	EC(100)		60.82(0.5) 83.01(0.62) 182.2(1.84) 265.34(0.19) 326.16(92) XK_{a1}:44.481(3.3)	0.3610	^{159}Tb(p,3n)
^{165}Dy	2.334 h	β^- (100)	207.1(0.15) 291.6(1.7) 719.9(0.16) 1192(15) 1286.7(83)	94.7(3.6) 279.763(0.5) 361.86(0.84) 545.834(0.162) 633.415(0.57) 715.328(0.53) XK_{a1}:47.546(4.7)	0.4740	^{164}Dy(n,γ)
^{166}Ho	26.8 h	β^- (100)	23.4(0.0362) 191.4(0.307) 394(0.95) 1773.3(48.7) 1853.9(50)	80.574(6.71) 1379.4(0.93) 1581.89(0.187) 1662.48(0.12) XK_{a1}:49.127(5.5) XL:6.95(8.3)	0.7264	^{165}Ho(n,γ)
^{169}Er	9.4 d	β^- (100)	342.5(45) 350.9(55)	8.41(0.158) 109.779(0.0013)	0.1035	^{168}Er(n,γ)
^{171}Er	7.516 h	β^- (100)	205.7(0.33) 492.1(0.52) 577.7(2.19) 814.8(0.19) 1065.7(94.4) 1490.7(2.3)	111.621(20.5) 116.656(2.3) 124.017(9.1) 295.901(28.9) 308.291(64) XK_{a1}:50.741(23.3)	0.7936	^{170}Er(n,γ)
^{170}Tm	128.6 d	β^- (99.87)	883.7(18.3) 968(81.6)	84.255(2.48) XL:7.42(3.1)	0.3321	^{169}Tm(n,γ)

				XK_{β}:59.4(0.71) $XK_{\alpha 2}$:51.354(0.97) $XK_{\alpha 1}$:52.389(1.71) 其他		
^{169}Yb	32.026 d	EC (100)		63.12044(44.2) 109.77924(17.5) 130.52293(11.3) 177.21307(22.2) 197.95675(35.8) 307.73757(10.05) $XK_{\alpha 1}$:50.7416(93.8) 其他	0.4773	^{168}Yb(n,γ)
^{175}Yb	4.185 d	ß⁻ (100)	72.5(10.2) 355(3.3) 468.8(86.5)	113.805(1.88) 282.522(3) 396.329(6.4) $XK_{\alpha 1}$:54.0698(1.84)	0.1699	^{174}Yb(n,γ)
^{177}Yb	1.911 h	^{68}Yb(n,γ)	156.6(3.9) 167,3(7.2) 1109(2) 1247.6(21) 1276.4(8) 1398(55)	122.7(3.4) 139.3(1.34) 150.6(20.3) 1080.2(5.6) 1241.2(3.5) $XK_{\alpha 1}$:54.069(3.3)	0.6309	^{176}Yb(n,γ)
^{176m}Lu	3.635 h	ß⁻ (99.9)	1227.3(61) 1315.7(39)	88.361(8.9) 其他	0.4929	^{175}Lu(n,γ)
^{177}Lu	6.647 d	ß⁻ (100)	176.5(12.2) 384.8(9.1) 497.8(78.6)	112.949(6.4) 208.366(11) $XK_{\alpha 1}$:55.79(2.88) XL:7.9(3.3)	0.1803	^{176}Lu(n,γ)
^{175}Hf	70 d	EC(100)		89.36(2.4) 343.4(84) 433(1.44) $XK_{\alpha 1}$:54.069(46.7)	0.3984	^{174}Hf(n,γ)
^{180m}Hf	5.5 h	IT(99.7)		57.547(48) 93.325(17.1) 215.426(81.3) 332.275(94.1) 443.163(81.9) 500.697(14.3)_ $XK_{\alpha 1}$:55.79(17.4) XL:7.9(23)	1.1321	^{179}Hf(n,γ)
^{181}Hf	42.39 d	ß⁻ (100)	409(7) 413(93) 546(0.25) 1028 (0.0003)	133.021(43.3) 136.26(5.85) 345.93(15.12) 482.18(80.5)	0.7377	^{180}Hf(n,γ)

				XK_{a1}:57.532(15.8)		
^{182}Ta	114.43 d 15.84 m 283 ms	ß⁻ (100) IT(100) IT(100)	260.4(29.3) 326.1(1.8) 439.8(20.5) 482.5(2.2) 524.4(39.7) 592.2(4)	67.7501(41.2) 100.11065(14.1) 1121.3008(34.9) 1189.0503(16.2) 1221.4066(27) 1231.0156(11.44) XK_{a1}:59.3182(18.4) XL:8.4(25) 146.785(37.2) 171.586(49) 184.951(24.5) 318.4(6.9) XK_{a1}:57.532(49.3) 16.263(0.0022) XL:8.15(20.7)	1.5023	^{181}Ta(n,γ)
^{181}W	121.2 d	EC(100)		6.24(1.03) 136.28(0.0311) 152.32(0.0083) XL8.15(22) $XK_{ß}$:65.2(13.8) XK_{a2}:56.277(18.8) XK_{a1}:57.532(33)	0.0533	^{180}W(n,γ)
^{185}W	75.1 d 1.67 m	ß⁻ (100) IT(100)	307.6(0.072) 433(99.928)	125.36(0.0192) XL8.65(0.0133) $XK_{ß}$:69.3(0.0089) XK_{a2}:59.7179(0.012) XK_{a1}:61.14(0.0208) 23.54(0.17) 65.86(5.8) 69.7(0.5) 94.59(0.105) 107.85(0.41) 122.05(0.102) 131.55(4.33) 164.33(0.59) 173.68(3.26) 187.88(0.81) XK_{a1}:59.3182(4.13) XL:8.4(46)	0.1270	^{184}W(n,γ)
^{187}W	23.72 h	ß⁻ (100)	539.5(4.23) 626.6(54.9) 686.9(3.3) 694(4.7)	72.002(11.1) 134.247(8.8) 479.55(21.8) 551.52(5.08)	0.7478	^{186}W(n,γ)

			1178.2(0.7) 1312.4(29.8)	618.26(6.28) 685.73(27.3) 772.89(4.12) $XK_{\alpha1}$:61.1403(12.5)		
^{183}Re	70 d	EC(100)		46.4842(7.97) 52.5962(2.21) 99.08(2.69) 107.934(2.17) 109.73(2.87) 162.326(23.3) 208.81(2.95) 291.7282(3.05) $XK_{\alpha1}$:59.3182(59.9) XL:8.4(61)	0.2667	^{181}Ta(α,2n)
	1.04 ms	IT(100)		145.4(32) 175.4(35) 193.9(73.5) 203.9(33) 231.4(29) 257(35) 303.9(32) 435.3(21) 488.4(32) 538.6(24) 585.5(59) $XK_{\alpha1}$:61.1403(89)		
^{186}Re	3.7183 d	β⁻ (92.53)	302(0.0625) 932.3(21.54) 1069(70.99)	137.157(9.42) 630.33(0.0293) 767.47(0.0327) $XK_{\alpha1}$:63.005(1.98) XL:8.91(3)	0.5370	^{185}Re(n,γ)
		EC (7.47)		122.64(0.603) $XK_{\alpha1}$:59.3182(4.13)		
^{188}Re	17 .004 h	β⁻ (100)	179.4(0.102) 355(0.181) 657.9(0.44) 1034(0.63) 1487.4(1.65) 1965.4(25.6) 2120.4(71.1)	155.041(15.1) 477.99(1.02) 632.983(1.27) 634.98(0.147) 672.535(0.111) 829.47(0.41) 931.345(0.55) $XK_{\alpha1}$:63.005(2.36) XL:8.91(3.1)	0.8406	^{187}Re(n,γ)
	18.6 m	IT(100)		63.6(21.6) 92.43(5.2)		

				105.96(10.8) 156.03(0.62) $XK_{\alpha1}$:61.1403(32) XL:8.65(39)		
^{185}Os	93.6 d	EC(100)		592.074(1.32) 646.116(78) 717.424(3.94) 874.813(6.29) 880.523(5.17) $XK_{\alpha1}$:61.1403(34.8)	0.7101	$^{184}Os(n,\gamma)$
^{191}Os	15.4 d 13.1 h	ß⁻ (100) IT(100)	142.4(100)	129.431(29) $XK_{\alpha1}$:64.8956(30.8) XL:9.18(43) 74.38(0.00737) $XK_{\alpha1}$:63.005(4.16) XL:8.91(23.1)		$^{190}Os(n,\gamma)$
^{193}Os	30.11 h	ß⁻ (100)	583.1(2.4) 680(7.9) 960.4(2.1) 1001.6(12.4) 1067.5(18) 1140.5(55)	73.04(3.2) 138.92(4.3) 460.49(3.95) 557.36(1.3) $XK_{\alpha1}$:64.895(6.3) XL:9.18(9.5)	0.4471	$^{192}Os(n,\gamma)$
^{192}Ir	73.827 d	ß⁻ (95.13) EC (4.87)	53.5(0.0035) 75.7(0.0039) 81.7(0.103) 258.7(5.6) 538.8(41.43) 675.1(48)	295.9565(28.72) 308.45507(29.68) 316.5(82.75) 468.07(47.81) 588.58(4.52) 604.41(8.2) 612.46(5.34) $XK_{\alpha1}$:66.832(4.57) 201.3112(0.473) 205.7943(3.34) 283.2668(0.266) 374.4852(0.726) 484.5751(3.187) 489.06(0.438) $XK_{\alpha1}$:63.005(2.103)	1.0342	$^{191}Ir(n,\gamma)$
^{194}Ir	19.28 h	ß⁻ (100)	979.7(1.77) 1624.8(1.28) 1918.3(9.3) 2246.8(85.4)	293.541(2.5) 328.448(13.1) 645.146(1.18) $XK_{\alpha1}$:66.832(0.41) 其他	0.9015	$^{193}Ir(n,\gamma)$

^{195m}Pt	4.02 d	IT(100)		30.89 (2.28) 98.9 (11.4) 129.79 (2.83) XK_{a1}:66.832(39) XL:9.44(73)	0.2617	^{194}Pt(n,γ)
^{197}Pt	19.8915 d 95.41 13.6 s	ß⁻ (100) ß⁻ (3.3) IT(96.7) IT(100)	450.1(8.2) 641.5(81) 718.9(11) 709.5 (3.3)	77.35(17) 191.437(3.7) XK_{a1}:68.8037(1.86) XL:9.71(21) 130 (0.105) 279 (2.4) XK_{a1}:68.8037(0.4) XL:9.71(1.13) 53.1(1.06) 346.5(11.1) XK_{a1}:68.832(23.3) XL:9.44(48)	0.2809	^{196}Pt(n,γ)
^{199}Pt	30.8 m 30.5 s	ß⁻ (100) IT(100)	734(1.4) 910(5.4) 967(7.9) 1159(15) 1378(1.9) 1385(4.2) 1702(63)	185.8(3.3) 191.69(2.3) 246.46(2.2) 317.03(5) 493.75(5.6) 542.98(14.7) XK_{a1}:68.8037(2.12) XL:9.71(4.5) 32(2.8) 391.93(84.7) XK_{a1}:66.832(3.44) XL:9.44(30)	0.7450	^{198}Pt(n,γ)
^{195}Au	186.098 d 30.5 s	EC (100) IT(100)		30.876(0.75) 98.88(10.9) 129.757(0.82) XK_{a1}:66.832(49.2) XL:9.44(57) 61.46 200.38 261.75 XK_{a1}:68.8037(11.4) XL:9.71(35)	0.1359	Pt(p,x)
^{198}Au	2.69517 d 2.27 d	ß⁻ (100) IT(100)	284.7(0.985) 960.6(98.99) 1372.4(0.025)	411.8(95.58) 675.88(0.804) 1087.684(0.159) XK_{a1}:70.819(1.38) 50.5(19)	0.7306	^{191}Au(n,γ)

				97.21(69.3) 180.31(50) 204.1(40.8) 214.89(77) 333.82(17) $XK_{\alpha1}$:68.803(41.8) XL:9.71(60)		
^{199}Au	3.139 d 0.44 ms	ß⁻ (100) IT(100)	244.4(21.5) 294.2(72) 452.6(6.5)	158.378(40) 208.20481(8.72) $XK_{ß}$:80.3(3.85) $XK_{\alpha1}$:70.819(8.76) 493.772(97.4) XL:9.71(27)	0.2412	^{198}Au(n,γ) ^{198}Au(d,n)
^{197m}Hg	23.8 h IT(91.4)	EC(8.6) 		130.2(0.27) 279(6.1) $XK_{\alpha1}$:68.8(4.2) XL:9.71(5.4) 133.98(33.5) 164.97(0.262) $XK_{\alpha1}$:70.819(16.3) XL:9.99(42)	0.3148	^{196}Hg(n,γ)
^{197}Hg	64.94 h	EC(100)		77.351(18.7) 191.364(0.632) $XK_{\alpha1}$:68.8(55) XL:9.71(65)	0.1442	^{196}Hg(n,γ) ^{197}Au(p,n)
^{203}Hg	46.612 d	ß⁻ (100)	212.6(100) 491.8(0.002)	279.194(81.46) $XK_{\alpha1}$:72.87(6.36)	0.3370	^{202}Hg(n,γ)
^{200}Tl						
^{201}Tl	72.912 h 2.035 ms	EC (100) IT(100)		5.84(0.52) 30.6(0.253) 32.19(0.258) 135.34(2.565) 165.88(0.155) 167.43(10) $XK_{\alpha1}$:70.819(46.4) 225(2.2) 331.1(87) 588(87) $XK_{\alpha1}$:72.871(5)	0.1385	Hg(d,x) ^{203}Tl(p,3n)
^{204}Tl	3.78 y	ß⁻ (97.1) EC (2.9)	763.7(97.11)	 XK:80.3(0.357) $XK_{\alpha2}$:68.895(0.477) $XK_{\alpha1}$:70.819(0.81)	0.2385	^{203}Tl(n,γ)
^{210}Pb	22.2 y	ß⁻ (100)	16.6(84)	46.539(4.25)	0.0457	^{208}Pb(t,p)

			63.1(16)	XL:10.8(25)		^{226}Ra子体
^{206}Bi	6.243 d	EC(100)		183.977(15.8) 343.51(23.4) 497.06(15.31) 516.18(40.7) 537.45(30.5) 803.1(98.9) 881.01(66.2) 895.12(15.66) 1098.26(13.5) 1718.7(31.8) $XK_{\alpha1}$:74.969(54.9)	3.14175	^{206}Pb(d,2n)
$^{.207}$Bi	32.9 y	EC(99.988) β^+(0.012)	806.1(0.012)	569.698(97.76) 1063.656(74.58) 1770.228(6.87) $XK_{\alpha1}$:74.969(36.82)	1.6563	Pb(d,x)
^{210}Bi	5.013 d	β^- (100)	1161.5(100)	351.06(12.91) XK_{β}:82.6(0.56) $XK_{\alpha2}$:70.8319(0.747) XL:10.3(1.05) $XK_{\alpha1}$:72.8715(1.27)	0.3889	^{209}Bi(n,γ) ^{210}Pb子体
^{208}Po	2.898 y	EC(0.0018) α(99.9982)	5114(99.9998)	31.8(0.00108) 291.9(0.00135)	5.2154	^{210}Bi（d,3n)
^{210}Po	138.376 d	α(100)	5304.38	803(0.00121)	5.4075	^{210}Bi(β-)
^{222}Rn	3.8235 d	α(100)	5489.48(99.92)	510(0.076)	5.5903	天然
^{224}Ra	3.66 d	α(100)	5448.6(5.07) 5685.37(94.91)	240.986(4.1) $XK_{\alpha1}$:83.78(0.217)	5.7893	天然
^{226}Ra	1600 y	α(100)	4601(5.55) 4784.34(94.45)	186.211(3.59) $XK_{\alpha2}$:81.07(0.197) $XK_{\alpha1}$:83.78(0.328)	4.8716	天然
^{228}Ra	5.75 y	β^- (100)	12.8(30) 25.7(20) 39.2(40) 39.6(10)	12.75(0.3) 13.52(1.6) 26.4(0.014) XI:12.7(1.13)	0.0163	天然
^{227}Ac	21.772 y	α(1.38) β^- (98.62)	4940(0.55) 4953(0.66) 43.5(99)	69.21(0.0065) 100(0.009) 160.26(0.0058) XI:12(0.0037)	0.0853	天然
^{228}Th	1.9116 y	α(100)	5340.31(27.2) 5423.2(72.2)	84.373(1.22) 131.613(0.1305) 166.41(0.1036) 215.983(0.254) XL:12.3(9.7)	5.5202	天然
^{231}Th	25.52 h	β^- (100)	142.3(2.7)	10.52(0.76)	0.1891	^{230}Th(n,γ)

			206.1(12.8) 215.4(1.3) 287.3(12) 288.2(37) 305.4(35)	19.1(3.7) 25.64(14.5) 81.228(0.89) 84.214(6.6) 89.95(0.94) XL:13.3(103)		
^{232}Th	1.405E+10 y	α(100)	3947 (21.7) 4013 (78.2)	63.81(0.263) XL:12.3(7.9)	4.0829	天然
^{233}Th	22.3 m	β⁻(100)	478.9(1.58) 689.6(1.7) 795.7(1.18) 1148.8(16) 1236.8(50) 1243.5(30)	8.22(19) 29.36(2.5) 86.48(2.7) 94.68(0.8) 459.222(1.4) 669.901(0.68) XL:13.3(7)	0.4515	^{232}Th(n,γ)
^{231}Pa	32760 y	α(100)	4951.3(22.8) 5013.8(25.4) 5028.4(20) 5058.6(11)	27.36(10.3) 283.69(1.7) 300.07(2.47) 302.65(2.2) 330.06(1.4) XL:12.7(36)	5.1580	天然
^{233}Pa	26.967 d	β⁻(100)	156.3(27.7) 173.5(16.4) 231.6(40) 259.9(17) 273.2(0.011) 572.1(4)	75.354(1.39) 86.814(1.97) 300.34(6.62) 340.81(4.47) 375.45(0.679) XK_{β}:111(8.2) $XK_{\alpha 2}$:98.439(17.7)	0.4380	^{232}Th(d,n)
^{232}U	68.9 y	α(100)	5263.41(31.6) 5320.17(68.2)	57.78(0.1999) 129.08(0.0682) XL:13(12)	5.4135	Th(α,4n)
^{235}U	7.04E+8 y	α(100)	4214.7(6.4) 4366.1(17) 4397.8(57) 4596(5.6)	19.59(2.6) 109.16(1.54) 143.76(10.96) 163.33(5.08) 185.715(57.2) 205.311(5.01) $XK_{\alpha 1}$:93.35(5.81)	4.6891	天然
^{237}U	6.75 d	β⁻(100)	147.7(0.8) 186.2(3.4) 237.2(51) 251.1(42) 459.1(3)	26.348(2.43) 59.536(34.5) 64.83(1.282) 164.61(1.86) 208(21.2) 232.36(1.2)	0.3433	^{238}U(n,2n)

				XK_{a1}:101.07(25.5)		
^{238}U	4.468E+9 y	α(100)	4151(21) 4198(79)	49.55(0.064) 113.5(0.0102) XL:13(8)	4.2691	天然
^{239}U	23.45 m	β^- (100)	299.8(0.23) 419.9(0.25) 444.8(0.27) 601.7(0.28) 1146.2(2) 1189.3(70) 1232.9(2) 1264(25)	43.533(3.14) 74.664(48.1) 117.66(0.13) 662.24(0.178) 748.08(0.0101) 819.22(0.144) 844.1(0.159) XL:13.9(6.7)	0.4626	$^{238}U(n,\gamma)$
^{237}Np	2.144E+6 y	α(100)	464.4(5.9) 4796(14.3) 4774(18.1) 4788(47.6) 4877.3(0.7)	8.22(9) 29.374(15) 57.104(0.39) 86.477(12.4) 87.99(0.14) 94.64(0.6) 117.702(0.16) 143.249(0.43) XK_{a1}:95.868(2.73)	4.9529	^{237}U (β^-)
^{239}Np	2.3565 d	β^- (100)	210.2(1.58) 330.4(40.5) 391.9(11) 436.5(45) 664.7(1) 714.1(2)	61.46(1.29) 106.123(27.2) 209.753(3.42) 228.183(10.76) 277.599(14.38) 315.88(1.6) 334.31(2.07) XL:14.3(18.5)	0.4469	$^{239}U(\beta^-)$
^{238}Pu	87.7 y	α(100)	5.456.3(28.98) 5.499(70.91)	43.498(0.0395) 99.853(0.00735) 152.72(0.000937) XL:13.6(11.7)	5.5930	^{238}Np (β^-)
^{239}Pu	24110 y	α(100)	5105.8(11.5) 5144.3(15.1) 5156.6(73.3)	12.965(0.0184) 38.661(0.0105) 51.624(0.0271) XL13.6(4.9)	5.2442	^{239}Np (β^-)
^{240}Pu	6564 y	α(100)	5123.68(26.4) 5168.17(73.5)	45.244(0.045) 104.234(0.00708) XL13.6(11)	5.2559	$^{239}Pu(n,\gamma)$
^{241}Pu	14.35 y	β^- (100)	20.81	XL13.6(0.00139)	0.0054	$^{239}Pu(2n,\gamma)$
^{241}Am	432.2 y	α(100)	5442.9(13.3) 5485.6(85.1)	26.344(2.4) 33.196(0.126)	5.6379	^{241}Pu (β^-)

				59.54(35.78) XL:13.9(42)		
^{242}Am	16.02 h 141y	EC (17.3) ß⁻ (82.7) α(0.46) IT(99.54)	 5141.6(0.027) 5206.8(0.412)	44.52(0.0138)	0.1994	^{241}Am(n,γ)
^{243}Am	7370 y	α(100)	5233.3(11) 5275.3(87.4)	43.53(5.93) 74.66(68.2) 86.71(0.338) 117.6(0.57) 141.89(0.12) XL:13.9(21.4)	5.4402	^{238}U 多次中子俘获
^{242}Cm	162.8 d	α(100)	6.069.42(25.9) 6112.72(74.1)	XL:14.3(11.4) 其他弱	6.2156	^{238}U 多次中子俘获
^{244}Cm	18.1 y	α(100)	5762.7(23.6) 5804.82(92.7)	XL:14.3(9.7) 其他弱	5.9014	^{238}U 多次中子俘获
^{252}Cf	2.645 y	α(96.91) SF(3.09)	5976.2(0.23) 6075.64(15.7) 6118(84.2)	XL:15(7.1) 其他弱	12.8107	^{239}Pu 多次中子俘获

*数据选自 ICRP 1007 (2007)，nt 是 nuclear transformation（核转变）的英文缩写。表中的核素半衰期按 ICRP107 报告进行修正。