

Experimental Atomic Masses

G. Audi and A.H. Wapstra, *Nucl. Phys. A595*, 409(1995).

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹ n	8071.323 2		782.353 2				
¹ H	7288.969 1						
² H	13135.720 1	2224.573 2				2224.57	2224.57
³ H	14949.794 1	8481.821 4	18.591 1			6257.25	
³ He	14931.204 1	7718.058 2					5493.49
⁴ H	25930 110	5580 110	23500 110			-2910 110	
⁴ He	2424.911 1	28295.674 5				20577.62	19813.85
⁴ Li	25320 210	4620 210		22900 210			-3100 210
⁵ H	36800 900	2700 900	25400 900			-2800 1000	
⁵ He	11390 50	27410 50			890 50	-890 50	21830 120
⁵ Li	11680 50	26330 50		290 70	1970 50	21710 220	-1970 50
⁵ Be	(38000)	(-1000)		(26000)			(-5000)
⁶ H	41900 300	5800 300	24300 300			3000 1000	
⁶ He	17594.1 10	29269.1 10	3507.8 9			1860 50	26500 900
⁶ Li	14086.3 5	31994.6 5			-1474.3 5	5660 50	4590 50
⁶ Be	18374 5	26924 5		4288 5		(28000)	590 50
⁷ He	26110 30	28820 30	11200 30			-440 30	23000 300
⁷ Li	14907.7 5	39244.5 5			-2467.0 5	7249.96 9	9975.4 9
⁷ Be	15769.5 5	37600.4 5		861.815 18	-1586.6 5	10676 5	5605.79 9
⁷ B	27870 70	24720 70		12100 70			-2200 70
⁸ He	31598 7	31408 7	10652 7			2580 30	
⁸ Li	20946.2 5	41277.3 5	16004.5 5		-7410 110	2032.80 12	12450 30
⁸ Be	4941.66 3	56499.51 4			91.84 4	18899.2 5	17255.0 5
⁸ B	22921.0 11	37737.8 11		17979.3 11	-4820 210	13020 70	137.5 10
⁸ C	35094 23	24782 23		12173 23			60 70
⁹ He	40820 60	30260 60	15860 60			-1150 60	
⁹ Li	24953.9 19	45340.9 19	13606.3 19		-14300 900	4063.6 19	13933 7
⁹ Be	11347.6 4	58164.9 4			-2460 50	1665.4 4	16887.6 6
⁹ B	12415.7 10	56314.4 10		1068.1 9	-1690 50	18576.6 15	-185.1 10
⁹ C	28913.7 22	39034.1 22		16497.9 24	(-12000)	14252 23	1296.3 23
¹⁰ He	48810 70	30340 70	15760 70			80 90	
¹⁰ Li	33050 15	45316 15	20444 15		-11200 300	-25 15	15060 60
¹⁰ Be	12606.6 4	64977.2 4	555.8 5		-7412.5 11	6812.33 6	19636.3 19
¹⁰ B	12050.8 4	64750.7 4			-4460.5 6	8436.3 10	6585.8 5
¹⁰ C	15698.6 4	60320.5 4		3647.81 9	-5101 5	21286.4 22	4006.1 10
¹⁰ N	(39700)	(35500)		(24000)			(-3500)
¹¹ Li	40800 30	45640 30	20620 30			330 30	15300 80
¹¹ Be	20174 6	65481 6	11506 6		-8360 30	504 6	20165 16
¹¹ B	8668.0 4	76204.8 4			-8664.6 6	11454.10 20	11227.6 6
¹¹ C	10650.5 10	73439.9 10		1982.5 9	-7543.9 11	13119.4 9	8689.2 9
¹¹ N	24960 180	58350 180		14310 180	-5330 190	(22800)	-1970 180
¹² Li	(50100)	(44400)	(25000)			(-1200)	
¹² Be	25076 15	68650 15	11708 15		-8946 17	3169 16	23010 30
¹² B	13368.9 14	79575.2 14	13368.9 14		-10002.2 15	3370.4 15	14094 7
¹² C		92161.750 14			-7366.57 4	18721.8 9	15957.0 4
¹² N	17338.1 10	74041.3 10		17338.1 10	-8007.8 15	15690 180	601.4 14
¹² O	32048 18	58549 18		14710 18	-5470 30		200 180
¹³ Be	33700 500	68100 500	17100 500		-9600 500	-500 500	(23700)
¹³ B	16562.2 11	84453.2 11	13437.2 11		-10816.6 22	4878.0 18	15803 15
¹³ C	3125.011 1	97108.063 16			-10647.5 4	4946.31	17532.9 14
¹³ N	5345.5 3	94105.3 3		2220.4 3	-9495.2 10	20063.9 10	1943.5 3
¹³ O	23111 10	75558 10		17765 10	-8228 10	17008 21	1516 10
¹⁴ Be	39880 110	69990 110	16220 110		-11350 130	1800 500	
¹⁴ B	23664 21	85423 21	20644 21		-11810 30	970 21	17300 500
¹⁴ C	3019.892 4	105284.508 19	156.475 4		-12011.6 4	8176.44	20831.3 11
¹⁴ N	2863.417 1	104658.625 16			-11612.3 4	10553.4 3	7550.56
¹⁴ O	8006.46 7	98733.23 8		5143.04 7	-10117.0 4	23176 10	4628.0 3
¹⁴ F	(33600)	(72300)		(25600)	(-8500)		(-3200)
¹⁵ B	28967 22	88191 22	19094 22		-14250 40	2770 30	18200 110
¹⁵ C	9873.1 8	106502.6 8	9771.7 8		-12726 6	1218.1 8	21080 21
¹⁵ N	101.438 1	115491.930 19			-10991.5 4	10833.30	10207.42
¹⁵ O	2855.4 5	111955.6 5		2753.9 5	-10220.0 11	13222.4 5	7297.0 5

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁵ F	16780 130	97250 130		13920 130	-10610 220	(24900)	-1480 130
¹⁶ B	37080 60	88150 60	23390 60		(-15400)	-40 60	
¹⁶ C	13694 4	110753 4	8011 4		-13807 15	4250 4	22562 23
¹⁶ N	5683 3	117981 3	10420 3		-10110 3	2489 3	11479 3
¹⁶ O	-4736.998 1	127619.336 19			-7161.91	15663.7 5	12127.41
¹⁶ F	10680 8	111420 8		15417 8	-9083 8	14170 130	-536 8
¹⁶ Ne	23992 20	97325 20		13312 22	-10480 30		70 140
¹⁷ B	43720 140	89580 140	22680 140			1440 150	
¹⁷ C	21037 17	111482 17	13166 23		-15000 500	729 18	23330 60
¹⁷ N	7871 15	123865 15	8680 15		-11116 15	5884 15	13112 15
¹⁷ O	-809.00 21	131762.66 21			-6358.92 21	4143.33 21	13781 3
¹⁷ F	1951.70 25	128219.61 25		2760.7 3	-5818.7 4	16800 8	600.27 25
¹⁷ Ne	16490 50	112900 50		14530 50	-9050 50	15580 50	1480 50
¹⁸ B	(52300)	(89100)	(27400)			(-500)	
¹⁸ C	24920 30	115670 30	11810 40		-17380 110	4180 30	26080 140
¹⁸ N	13117 20	126690 20	13899 20		-12970 30	2825 25	15210 30
¹⁸ O	-782.1 8	139807.0 8			-6226.9 8	8044.4 8	15942 15
¹⁸ F	873.4 6	137369.2 6		1655.5 6	-4414.9 6	9149.6 6	5606.5 6
¹⁸ Ne	5306.8 15	132153.5 15		4433.4 16	-5124.6 15	19250 50	3933.9 15
¹⁸ Na	(25300)	(111400)		(20000)	(-10700)		(-1500)
¹⁹ B	(59400)	(90100)	(26500)			(1000)	
¹⁹ C	32830 110	115830 110	16970 110			160 110	(26800)
¹⁹ N	15860 16	132018 16	12527 17		-15530 30	5330 30	16350 30
¹⁹ O	3334 3	143763 3	4821 3		-8964 3	3956 3	17073 20
¹⁹ F	-1487.41 7	147801.36 7			-4013.75 7	10432.2 6	7994.3 8
¹⁹ Ne	1751.1 6	143780.5 6		3238.5 6	-3529.2 8	11627.0 16	6411.3 8
¹⁹ Na	12929 12	131821 12		11178 12	-6270 130	(20500)	-333 12
²⁰ C	37560 200	119170 200	15790 210			3340 230	(29100)
²⁰ N	21770 50	134180 50	17970 50		-17740 80	2170 60	18360 120
²⁰ O	3796.9 12	151370.7 12	3814.3 12		-12322 4	7608 3	19353 16
²⁰ F	-17.40 8	154402.67 9	7024.53 8		-8126 3	6601.31 5	10640 3
²⁰ Ne	-7041.930 2	160644.859 24			-4729.84	16864.3 6	12843.49 7
²⁰ Na	6845 7	145976 7		13887 7	-6260 11	14155 14	2195 7
²⁰ Mg	17570 30	134470 30		10730 30	-8850 30		2650 30
²¹ C	(46000)	(118800)	(20700)			(-300)	
²¹ N	25230 90	138790 90	17170 90		-20910 160	4610 100	19620 220
²¹ O	8062 12	155177 12	8109 12		-15400 21	3807 12	20990 50
²¹ F	-47.6 18	162504.2 18	5684.1 18		-10343 15	8101.5 18	11133.5 22
²¹ Ne	-5731.72 4	167405.97 5			-7347.63 21	6761.11 4	13003.29 9
²¹ Na	-2184.3 7	163076.2 7		3547.5 7	-6560.9 7	17100 7	2431.3 7
²¹ Mg	10912 16	149198 16		13096 16	-8000 50	14730 30	3222 18
²¹ Al	(26100)	(133200)		(15200)			(-1300)
²² C	(52600)	(120300)	(20500)			(1400)	
²² N	32080 200	140010 200	22800 200		(-22700)	1220 220	(21200)
²² O	9280 60	162030 60	6490 60		-18060 60	6850 60	23240 110
²² F	2794 12	167734 12	10818 12		-12748 24	5230 13	12557 17
²² Ne	-8024.34 22	177769.91 22			-9667.2 8	10363.95 22	15265.7 18
²² Na	-5182.1 5	174145.3 5		2842.2 4	-8480.5 7	11069.2 8	6739.4 4
²² Mg	-396.8 14	168577.6 14		4785.3 14	-8128.5 20	19380 16	5501.5 15
²² Al	(18180)	(149220)		(18580)	(-9600)	(16000)	(20)
²² Si	(32160)	(134450)		(13980)			(1200)
²³ N	(37700)	(142400)	(23100)		(-24100)	(2400)	(22100)
²³ O	14620 100	164770 100	11290 130		-20640 150	2740 120	24750 220
²³ F	3330 80	175270 80	8480 80		-14960 80	7540 80	13240 100
²³ Ne	-5153.64 25	182970.53 25	4375.84 20		-10912 3	5200.62 12	15236 12
²³ Na	-9529.49 21	186564.02 21			-10466.99 22	12418.7 4	8794.11 16
²³ Mg	-5472.7 13	181724.8 13		4056.8 12	-9648.6 14	13147.2 18	7579.5 13
²³ Al	6767 25	168703 25		12240 25	-8590 30	(19490)	125 25
²³ Si	(23770)	(150920)		(17010)		(16500)	(1700)
²⁴ N	(47000)	(141200)	(28100)			(-1200)	
²⁴ O	19000 300	168500 300	11400 300		-21000 400	3700 300	(26000)
²⁴ F	7540 70	179130 70	13490 70		-16650 80	3860 100	14360 120
²⁴ Ne	-5948 10	191836 10	2470 10		-12169 10	8865 10	16570 80
²⁴ Na	-8417.60 22	193523.47 22	5515.78 16		-10825.12 23	6959.44 5	10552.93 20
²⁴ Mg	-13933.38 19	198256.89 19			-9316.36 19	16532.0 12	11692.86 15
²⁴ Al	-55 4	183596 4		13878 4	-9325 8	14894 25	1871 4
²⁴ Si	10755 19	172004 19		10810 20	-9240 30	(21090)	3300 30
²⁴ P	(32000)	(150000)		(21200)			(-900)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²⁵ O	(27100)	(168400)	(15900)		(-21200)	(-100)	(27200)
²⁵ F	11270 <i>80</i>	183480 <i>80</i>	13330 <i>90</i>		-16390 <i>120</i>	4350 <i>100</i>	15000 <i>300</i>
²⁵ Ne	-2060 <i>40</i>	196020 <i>40</i>	7300 <i>40</i>		-12550 <i>50</i>	4180 <i>50</i>	16890 <i>80</i>
²⁵ Na	-9357.5 <i>12</i>	202534.6 <i>12</i>	3835.3 <i>12</i>		-11734.8 <i>22</i>	9011.2 <i>12</i>	10699 <i>10</i>
²⁵ Mg	-13192.73 <i>19</i>	205587.56 <i>19</i>			-9885.92 <i>19</i>	7330.67 <i>4</i>	12064.09 <i>16</i>
²⁵ Al	-8915.7 <i>7</i>	200528.2 <i>7</i>		4277.0 <i>7</i>	-9156.4 <i>10</i>	16932 <i>4</i>	2271.3 <i>7</i>
²⁵ Si	3825 <i>10</i>	187005 <i>10</i>		12741 <i>10</i>	-9511 <i>19</i>	15001 <i>22</i>	3409 <i>11</i>
²⁵ P	(18870)	(171180)		(15050)	(-9700)	(21200)	(-830)
²⁶ O	(35200)	(168400)	(16900)		(-19800)	(100)	
²⁶ F	18290 <i>120</i>	184530 <i>120</i>	17860 <i>140</i>		-16220 <i>230</i>	1050 <i>150</i>	(16100)
²⁶ Ne	430 <i>50</i>	201600 <i>50</i>	7330 <i>60</i>		-11280 <i>80</i>	5580 <i>70</i>	18130 <i>90</i>
²⁶ Na	-6902 <i>14</i>	208151 <i>14</i>	9312 <i>14</i>		-12121 <i>19</i>	5616 <i>14</i>	12130 <i>50</i>
²⁶ Mg	-16214.48 <i>19</i>	216680.63 <i>19</i>			-10615.04 <i>20</i>	11093.07 <i>4</i>	14146.0 <i>12</i>
²⁶ Al	-12210.34 <i>20</i>	211894.14 <i>20</i>		4004.14 <i>6</i>	-9453.2 <i>5</i>	11365.9 <i>7</i>	6306.58 <i>5</i>
²⁶ Si	-7145 <i>3</i>	206046 <i>3</i>		5066 <i>3</i>	-9173 <i>3</i>	19041 <i>10</i>	5518 <i>3</i>
²⁶ P	(10970)	(187150)		(18120)	(-9640)	(16000)	(140)
²⁶ S	(26000)	(171400)		(15000)	(-8600)		(200)
²⁷ F	25100 <i>400</i>	185800 <i>400</i>	18000 <i>400</i>		(-15100)	1300 <i>400</i>	(17400)
²⁷ Ne	7090 <i>90</i>	203010 <i>90</i>	12670 <i>100</i>		-9950 <i>140</i>	1410 <i>110</i>	18480 <i>150</i>
²⁷ Na	-5580 <i>40</i>	214900 <i>40</i>	9010 <i>40</i>		-11340 <i>90</i>	6750 <i>40</i>	13300 <i>70</i>
²⁷ Mg	-14586.50 <i>20</i>	223123.98 <i>20</i>	2610.33 <i>17</i>		-11857.77 <i>24</i>	6443.35 <i>4</i>	14973 <i>14</i>
²⁷ Al	-17196.83 <i>13</i>	224951.95 <i>13</i>			-10092.25 <i>20</i>	13057.81 <i>17</i>	8271.32 <i>16</i>
²⁷ Si	-12384.43 <i>16</i>	219357.20 <i>16</i>		4812.40 <i>10</i>	-9336.7 <i>12</i>	13311 <i>3</i>	7463.06 <i>19</i>
²⁷ P	-750 <i>40</i>	206940 <i>40</i>		11630 <i>40</i>	-9950 <i>40</i>	(19800)	900 <i>40</i>
²⁷ S	(17510)	(187900)		(18260)	(-8700)	(16500)	(800)
²⁸ F	(33200)	(185700)	(21900)		(-16200)	(-100)	
²⁸ Ne	11280 <i>110</i>	206890 <i>110</i>	12310 <i>140</i>		-10100 <i>300</i>	3890 <i>140</i>	21100 <i>400</i>
²⁸ Na	-1030 <i>80</i>	218420 <i>80</i>	13990 <i>80</i>		-11000 <i>100</i>	3520 <i>80</i>	15420 <i>120</i>
²⁸ Mg	-15018.8 <i>20</i>	231627.5 <i>20</i>	1831.8 <i>20</i>		-11496 <i>10</i>	8503.6 <i>20</i>	16730 <i>40</i>
²⁸ Al	-16850.55 <i>14</i>	232677.00 <i>14</i>	4642.24 <i>14</i>		-10857.86 <i>21</i>	7725.05 <i>6</i>	9553.02 <i>18</i>
²⁸ Si	-21492.793 <i>2</i>	236536.89 <i>3</i>			-9984.32 <i>19</i>	17179.69 <i>16</i>	11584.93 <i>13</i>
²⁸ P	-7161 <i>4</i>	221423 <i>4</i>		14332 <i>4</i>	-9531 <i>5</i>	14480 <i>40</i>	2066 <i>4</i>
²⁸ S	4070 <i>160</i>	209410 <i>160</i>		11230 <i>160</i>	-9110 <i>160</i>	(21500)	2460 <i>160</i>
²⁸ Cl	(26600)	(186100)		(22500)	(-7900)		(-1800)
²⁹ F	(40300)	(186700)	(22300)			(1000)	
²⁹ Ne	18000 <i>300</i>	208200 <i>300</i>	15400 <i>300</i>		(-11500)	1300 <i>300</i>	(22500)
²⁹ Na	2620 <i>90</i>	222840 <i>90</i>	13280 <i>90</i>		-11070 <i>120</i>	4420 <i>120</i>	15950 <i>140</i>
²⁹ Mg	-10660 <i>30</i>	235340 <i>30</i>	7550 <i>30</i>		-11030 <i>50</i>	3710 <i>30</i>	16920 <i>80</i>
²⁹ Al	-18215.5 <i>12</i>	242113.3 <i>12</i>	3679.5 <i>12</i>		-11283.0 <i>17</i>	9436.3 <i>12</i>	10485.7 <i>23</i>
²⁹ Si	-21895.03 <i>3</i>	245010.44 <i>5</i>			-11127.21 <i>19</i>	8473.55 <i>3</i>	12333.44 <i>14</i>
²⁹ P	-16951.9 <i>7</i>	239285.0 <i>7</i>		4943.1 <i>7</i>	-10461.1 <i>10</i>	17862 <i>4</i>	2748.1 <i>7</i>
²⁹ S	-3160 <i>50</i>	224710 <i>50</i>		13790 <i>50</i>	-9410 <i>50</i>	15300 <i>170</i>	3290 <i>50</i>
²⁹ Cl	(13140)	(207630)		(16300)	(-8200)	(21500)	(-1780)
³⁰ Ne	22200 <i>800</i>	212100 <i>800</i>	13600 <i>800</i>		(-15400)	3900 <i>900</i>	(25300)
³⁰ Na	8590 <i>90</i>	224940 <i>90</i>	17480 <i>110</i>		-12120 <i>160</i>	2100 <i>130</i>	16700 <i>300</i>
³⁰ Mg	-8880 <i>70</i>	241630 <i>70</i>	6990 <i>70</i>		-11740 <i>90</i>	6290 <i>70</i>	18790 <i>110</i>
³⁰ Al	-15872 <i>14</i>	247841 <i>14</i>	8561 <i>14</i>		-11395 <i>20</i>	5728 <i>14</i>	12500 <i>30</i>
³⁰ Si	-24432.88 <i>4</i>	255619.63 <i>6</i>			-10643.32 <i>20</i>	10609.18 <i>3</i>	13506.3 <i>12</i>
³⁰ P	-20200.6 <i>4</i>	250604.9 <i>4</i>		4232.3 <i>4</i>	-10415.1 <i>4</i>	11320.0 <i>8</i>	5594.5 <i>4</i>
³⁰ S	-14063 <i>3</i>	243685 <i>3</i>		6138 <i>3</i>	-9343 <i>4</i>	18980 <i>50</i>	4400 <i>3</i>
³⁰ Cl	(4440)	(224400)		(18510)	(-9000)	(16800)	(-310)
³⁰ Ar	(20100)	(208000)		(15600)	(-8300)		(300)
³¹ Ne	(30800)	(211500)	(18200)			(-500)	
³¹ Na	12660 <i>160</i>	228940 <i>160</i>	15880 <i>180</i>		-14800 <i>400</i>	4000 <i>190</i>	16900 <i>800</i>
³¹ Mg	-3220 <i>80</i>	244040 <i>80</i>	11740 <i>80</i>		-12730 <i>120</i>	2400 <i>100</i>	19100 <i>120</i>
³¹ Al	-14954 <i>20</i>	254995 <i>20</i>	7995 <i>20</i>		-11800 <i>40</i>	7153 <i>25</i>	13360 <i>70</i>
³¹ Si	-22948.96 <i>6</i>	262207.03 <i>8</i>	1492.03 <i>19</i>		-10787.37 <i>21</i>	6587.40 <i>5</i>	14366 <i>14</i>
³¹ P	-24440.99 <i>18</i>	262916.69 <i>19</i>			-9669.07 <i>22</i>	12311.8 <i>4</i>	7297.08 <i>19</i>
³¹ S	-19044.9 <i>15</i>	256738.3 <i>15</i>		5396.1 <i>15</i>	-9085.4 <i>15</i>	13053 <i>3</i>	6133.3 <i>16</i>
³¹ Cl	-7060 <i>50</i>	243980 <i>50</i>		11980 <i>50</i>	-8740 <i>60</i>	(19580)	290 <i>50</i>
³¹ Ar	(11300)	(224830)		(18360)	(-8600)	(16900)	(400)
³² Ne	(37200)	(213300)	(18900)			(1700)	
³² Na	18300 <i>500</i>	231400 <i>500</i>	19100 <i>500</i>		(-17300)	2400 <i>500</i>	(19800)
³² Mg	-800 <i>100</i>	249690 <i>100</i>	10270 <i>130</i>		-14500 <i>150</i>	5650 <i>120</i>	20750 <i>190</i>
³² Al	-11060 <i>90</i>	259170 <i>90</i>	13020 <i>90</i>		-12450 <i>120</i>	4180 <i>90</i>	15140 <i>120</i>
³² Si	-24080.9 <i>22</i>	271410.3 <i>22</i>	224.5 <i>22</i>		-11487 <i>3</i>	9203.2 <i>22</i>	16416 <i>20</i>
³² P	-24305.32 <i>19</i>	270852.34 <i>19</i>	1710.66 <i>21</i>		-9879.68 <i>23</i>	7935.65 <i>4</i>	8645.33 <i>20</i>
³² S	-26015.98 <i>11</i>	271780.66 <i>12</i>			-6948.10 <i>11</i>	15042.4 <i>15</i>	8863.96 <i>21</i>
³² Cl	-13331 <i>7</i>	258313 <i>7</i>		12685 <i>7</i>	-8595 <i>8</i>	14340 <i>50</i>	1575 <i>7</i>

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
³² Ar	-2180 50	246380 50		11150 50	-8680 170	(21550)	2400 70
³² K	(20400)	(223000)		(22600)	(-8600)		(-1800)
³³ Na	25500 1500	232200 1500	20300 1500		(-17200)	900 1600	(19000)
³³ Mg	5200 150	251760 150	13710 160		-15200 300	2070 170	20400 500
³³ Al	-8500 70	264690 70	11990 70		-13550 110	5510 110	15000 120
³³ Si	-20492 16	275893 16	5845 16		-12260 30	4483 16	16720 90
³³ P	-26337.7 11	280956.1 11	248.5 11		-10547.1 16	10103.7 11	9545.8 24
³³ S	-26586.23 11	280422.22 12			-7116.12 11	8641.58 3	9569.89 21
³³ Cl	-21003.5 5	274057.2 5		5582.7 5	-6476.5 9	15744 7	2276.5 5
³³ Ar	-9380 30	261650 30		11620 30	-8650 60	15270 60	3340 30
³³ K	(6760)	(244730)		(16140)	(-8800)	(21700)	(-1650)
³⁴ Na	(32500)	(233300)	(24100)			(1100)	
³⁴ Mg	8500 300	256600 300	11300 300		-16200 900	4800 300	24300 1500
³⁴ Al	-2860 90	267120 90	17090 90		-13880 130	2430 110	15360 170
³⁴ Si	-19957 14	283429 14	4601 15		-13500 70	7536 21	18740 70
³⁴ P	-24558 5	287247 5	5374 5		-11110 15	6291 5	11354 17
³⁴ S	-29931.85 10	291839.16 11			-7923.88 11	11416.94 5	10883.1 11
³⁴ Cl	-24440.57 12	285565.53 13		5491.28 7	-6664.9 4	11508.4 5	5143.30 5
³⁴ Ar	-18378 3	278721 3		6062 3	-6740 4	17070 30	4664 3
³⁴ K	(-1500)	(261000)		(16900)	(-8300)	(16300)	(-600)
³⁴ Ca	(13200)	(245600)		(14600)	(-9400)		(900)
³⁵ Na	(41200)	(232700)	(24900)			(-600)	
³⁵ Mg	(16300)	(256800)	(16400)		(-17000)	(200)	(23500)
³⁵ Al	-60 140	272380 140	14300 150		-15150 220	5270 170	15800 300
³⁵ Si	-14360 40	285900 40	10500 40		-13570 80	2470 40	18790 100
³⁵ P	-24857.6 19	295618.6 19	3988.8 19		-12328 20	8371 5	12190 14
³⁵ S	-28846.37 9	298825.00 10	167.14 8		-8322.32 11	6985.84 4	11578 5
³⁵ Cl	-29013.51 4	298209.81 6			-6997.43 19	12644.27 11	6370.63 9
³⁵ Ar	-23048.2 8	291462.2 8		5965.3 8	-6428.2 17	12741 3	5896.6 8
³⁵ K	-11167 20	278799 20		11881 20	-6530 50	(17800)	78 20
³⁵ Ca	(4440)	(262410)		(15610)	(-9280)	(16800)	(1400)
³⁶ Mg	(20900)	(260300)	(15000)		(-18700)	(3500)	(27500)
³⁶ Al	5900 300	274500 300	18300 300		-14800 600	2100 300	(17700)
³⁶ Si	-12400 100	292020 100	7850 100		-14030 140	6110 110	19630 170
³⁶ P	-20251 13	299083 13	10413 13		-11610 90	3465 13	13180 40
³⁶ S	-30663.96 23	308713.94 24			-9008.0 22	9888.91 25	13095.3 19
³⁶ Cl	-29521.89 8	306789.50 9	708.6 3	1142.07 25	-7641.48 20	8579.70 7	7964.48 11
³⁶ Ar	-30230.4 3	306715.7 3			-6639.4 3	15253.5 8	8505.90 25
³⁶ K	-17425 8	293128 8		12805 8	-6519 10	14329 21	1666 8
³⁶ Ca	-6440 40	281360 40		10990 40	-6690 60	(18950)	2560 40
³⁶ Sc	(13900)	(260200)		(20300)	(-8900)		(-2200)
³⁷ Mg	(29100)	(260200)	(19500)			(-100)	
³⁷ Al	9600 500	278900 500	16100 600		-18300 1600	4400 600	(18600)
³⁷ Si	-6520 130	294210 130	12470 130		-14150 190	2190 160	19700 300
³⁷ P	-18990 40	305900 40	7900 40		-12910 80	6820 40	13880 110
³⁷ S	-26896.2 3	313017.5 3	4865.30 25		-8829 16	4303.58 9	13934 13
³⁷ Cl	-31761.52 5	317100.47 7			-7848.7 11	10310.96 9	8386.53 23
³⁷ Ar	-30948.0 3	315504.6 3		813.5 3	-6786.7 3	8788.9 4	8715.1 3
³⁷ K	-24799.2 3	308573.5 3		6148.8 4	-6220.6 6	15445 8	1857.77 9
³⁷ Ca	-13161 22	296152 22		11639 22	-6200 40	14790 50	3025 24
³⁷ Sc	(2800)	(279400)		(16000)	(-6300)	(19100)	(-2000)
³⁸ Al	(15700)	(280800)	(19500)		(-19200)	(1900)	(20600)
³⁸ Si	-3700 300	299500 300	10700 300		-14600 400	5300 300	20600 600
³⁸ P	-14470 140	309440 140	12390 140		-14030 170	3540 140	15230 190
³⁸ S	-26861 7	321054 7	2937 7		-9329 16	8036 7	15160 40
³⁸ Cl	-29797.98 11	323208.25 12	4916.8 5		-7665 5	6107.78 10	10190.7 3
³⁸ Ar	-34714.8 5	327342.7 5			-7207.8 5	11838.0 6	10242.2 5
³⁸ K	-28801.7 7	320647.3 7		5913.1 6	-6786.0 7	12073.8 8	5142.6 8
³⁸ Ca	-22059 5	313122 5		6743 5	-6106 5	16970 23	4549 5
³⁸ Sc	(-4900)	(295200)		(17100)	(-5900)	(15800)	(-900)
³⁸ Ti	(9100)	(280400)		(14000)	(-6500)		(1000)
³⁹ Al	(20400)	(284200)	(18300)		(-23200)	(3400)	
³⁹ Si	(2100)	(301700)	(14800)		(-16600)	(2200)	(20900)
³⁹ P	-12650 150	315700 150	10510 160		-15020 210	6250 200	16200 300
³⁹ S	-23160 50	325430 50	6640 50		-11230 60	4370 50	15980 150
³⁹ Cl	-29800.7 17	331282.2 17	3441 5		-7368 3	8074.0 17	10229 7
³⁹ Ar	-33242 5	333941 5	565 5		-6820 5	6598 5	10733 5
³⁹ K	-33806.8 3	333723.7 3			-7218.2 3	13076.5 7	6381.0 4
³⁹ Ca	-27276.3 18	326410.8 18		6530.6 18	-6653.0 19	13289 5	5763.5 19

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
³⁹ Sc	-14168.24	312520.24		13108.24	-5430.30	(17300)	-602.24
³⁹ Ti	(1230)	(296340)		(15400)	(-5630)	(15900)	(1100)
⁴⁰ Si	(5400)	(306500)	(13700)		(-17900)	(4800)	(22300)
⁴⁰ P	-8340.200	319450.200	14500.300		-16700.300	3760.250	(17800)
⁴⁰ S	-22850.230	333180.230	4710.240		-12870.250	7760.240	17500.300
⁴⁰ Cl	-27560.30	337110.30	7480.30		-9730.30	5830.30	11690.60
⁴⁰ Ar	-35039.891.4	343810.44.5			-6800.84.23	9869.5	12528.2.17
⁴⁰ K	-33535.0.3	341523.2.3	1311.09.12	1504.9.3	-6438.0.3	7799.50.8	7582.5
⁴⁰ Ca	-34846.1.3	342052.0.3			-7040.6.4	15641.2.18	8328.24.9
⁴⁰ Sc	-20526.4	326950.4		14320.4	-5526.9	14430.24	539.4
⁴⁰ Ti	-8850.160	314490.160		11680.160	-4840.160	(18150)	1970.160
⁴⁰ V	(10300)	(294500)		(19200)	(-6000)		(-1800)
⁴¹ Si	(11800)	(308100)	(16700)		(-19700)	(1600)	
⁴¹ P	-4800.500	324000.500	13800.500		-16900.700	4600.500	(17500)
⁴¹ S	-18600.210	337010.210	8740.220		-14500.250	3800.300	17600.300
⁴¹ Cl	-27340.60	344960.60	5730.60		-10770.80	7850.70	11780.240
⁴¹ Ar	-33067.3.7	349909.1.7	2491.6.7		-8596.0.7	6098.7.6	12800.30
⁴¹ K	-35558.9.3	351618.4.3			-6222.3.3	10095.18.10	7808.0.3
⁴¹ Ca	-35137.5.4	350414.7.4		421.4.3	-6614.4.5	8362.7.3	8891.4.3
⁴¹ Sc	-28642.2.3	343137.0.3		6495.3.3	-6267.9.4	16187.4	1085.07.9
⁴¹ Ti	(-15710)	(329430)		(12930)	(-4980)	(14930)	(2480)
⁴¹ V	(-240)	(313170)		(15470)	(-5500)	(18600)	(-1300)
⁴² Si	(15000)	(313000)	(14900)			(4900)	
⁴² P	(100)	(327200)	(17300)		(-18100)	(3100)	(19000)
⁴² S	-17200.300	343700.300	7700.300		-15900.400	6700.400	19700.600
⁴² Cl	-24990.110	350680.110	9430.120		-12950.180	5720.130	13670.240
⁴² Ar	-34420.40	359340.40	600.40		-9990.40	9430.40	14370.80
⁴² K	-35021.3.3	359152.2.3	3525.4.3		-7648.3.3	7533.77.15	9243.0.7
⁴² Ca	-38546.8.4	361895.3.4			-6256.9.5	11480.60.6	10276.9.3
⁴² Sc	-32120.9.4	354687.1.4		6425.84.13	-5744.1.8	11550.0.3	4272.41.12
⁴² Ti	-25121.5	346905.5		7000.5	-5487.7	(17480)	3768.5
⁴² V	(-8170)	(329170)		(16950)	(-5700)	(16000)	(-260)
⁴² Cr	(6000)	(314200)		(14200)	(-5500)		(1100)
⁴³ P	(3100)	(332200)	(15600)		(-19700)	(5100)	(19200)
⁴³ S	-12500.800	347000.800	11500.900		(-17000)	3300.900	(19900)
⁴³ Cl	-24030.160	357800.160	7950.180		-13800.220	7110.200	14100.400
⁴³ Ar	-31980.70	364960.70	4620.70		-11240.90	5630.80	14280.130
⁴³ K	-36593.9	368795.9	1815.9		-9217.9	9643.9	9460.40
⁴³ Ca	-38408.4.5	369828.3.5			-7592.5	7933.0.3	10676.1.4
⁴³ Sc	-36187.6.19	366825.1.19		2220.8.19	-4805.7.19	12138.0.19	4929.8.19
⁴³ Ti	-29320.7	359175.7		6867.7	-4469.7	12271.9	4488.7
⁴³ V	(-18020)	(347100)		(11300)	(-6280)	(17900)	(190)
⁴³ Cr	(-2140)	(330430)		(15890)	(-5790)	(16200)	(1260)
⁴⁴ P	(9200)	(334200)	(20100)			(2000)	
⁴⁴ S	(-10900)	(353500)	(9100)		(-18700)	(6500)	(21300)
⁴⁴ Cl	-19990.220	361830.220	12270.220		-14100.300	4000.300	14800.900
⁴⁴ Ar	-32262.20	373318.20	3550.40		-11840.230	8360.70	15520.160
⁴⁴ K	-35810.40	376080.40	5660.40		-10680.50	7290.40	11120.80
⁴⁴ Ca	-41469.1.9	380960.2.9			-8854.1.8	11132.0.7	12165.9
⁴⁴ Sc	-37815.8.18	376524.6.18		3653.3.19	-6705.7.18	9700.3	6696.3.17
⁴⁴ Ti	-37548.3.8	375474.7.8		267.5.19	-5127.1.7	16299.7	8649.6.20
⁴⁴ V	(-23850)	(360990)		(13700)	(-5750)	(13890)	(1820)
⁴⁴ Cr	(-13540)	(349900)		(10310)	(-7110)	(19470)	(2800)
⁴⁴ Mn	(6400)	(329200)		(19900)	(-6400)		(-1200)
⁴⁵ P	(14100)	(337400)	(18900)			(3200)	
⁴⁵ S	(-4800)	(355500)	(14100)		(-19100)	(2000)	(21300)
⁴⁵ Cl	-18900.700	368800.700	10800.700		-16500.800	7000.700	(15300)
⁴⁵ Ar	-29720.60	378850.60	6890.60		-13540.220	5530.60	17020.230
⁴⁵ K	-36608.10	384953.10	4205.10		-11690.70	8870.40	11635.23
⁴⁵ Ca	-40812.5.9	388375.0.9	256.8.9		-10170.2.11	7414.8.3	12290.40
⁴⁵ Sc	-41069.3.11	387849.4.11			-7935.4.11	11324.8.20	6889.2.9
⁴⁵ Ti	-39006.9.12	385004.7.12		2062.4.5	-6294.3.12	9529.9.14	8480.1.21
⁴⁵ V	-31874.17	377089.17		7133.17	-5656.17	(16100)	1614.17
⁴⁵ Cr	(-19410)	(363850)		(12460)	(-6120)	(13950)	(2860)
⁴⁵ Mn	(-5100)	(348800)		(14300)	(-7300)	(19600)	(-1100)
⁴⁵ Fe	(13600)	(329300)		(18700)			(100)
⁴⁶ P	(22200)	(337300)	(22600)			(-0)	
⁴⁶ S	(-400)	(359200)	(14400)		(-17800)	(3600)	(21800)
⁴⁶ Cl	(-14800)	(372800)	(14900)		(-17300)	(4000)	(17300)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁴⁶ Ar	-29720 40	386920 40	5700 40		-14900 300	8070 70	18100 700
⁴⁶ K	-35419 16	391835 16	7716 16		-12860 110	6882 18	12990 60
⁴⁶ Ca	-43134.9 24	398768.7 24			-11140 40	10393.7 24	13816 10
⁴⁶ Sc	-41758.6 11	396610.1 11	2366.7 7	1376.3 24	-9162.2 11	8760.62 11	8235.1 9
⁴⁶ Ti	-44125.3 11	398194.4 11			-8003.5 11	13189.8 8	10345.0 7
⁴⁶ V	-37073.9 15	390360.7 15		7051.4 10	-7377.9 15	13272 17	5356.0 13
⁴⁶ Cr	-29471 20	381975 20		7603 20	-6775 21	(18130)	4890 30
⁴⁶ Mn	(-12370)	(364090)		(17100)	(-6630)	(15300)	(250)
⁴⁶ Fe	(800)	(350200)		(13100)	(-7700)	(20900)	(1400)
⁴⁷ S	(7100)	(359700)	(18300)			(600)	(22400)
⁴⁷ Cl	(-11200)	(377300)	(14700)		(-16700)	(4500)	(18100)
⁴⁷ Ar	-25910 100	391180 100	9790 100		-15900 800	4260 110	(18400)
⁴⁷ K	-35697 8	400184 8	6643 8		-14090 160	8349 16	13270 40
⁴⁷ Ca	-42339.7 23	406044.8 23	1991.9 12		-12790 70	7276.1 5	14210 16
⁴⁷ Sc	-44331.6 21	407254.4 21	600.1 19		-10164 9	10644.3 21	8485.7 13
⁴⁷ Ti	-44931.7 10	407072.1 10			-8948.2 10	8877.7 10	10462.1 11
⁴⁷ V	-42003.9 11	403362.0 11		2927.8 10	-8241.2 22	13001.3 10	5167.56 7
⁴⁷ Cr	-34552 14	395128 14		7452 14	-7657 16	13153 24	4767 14
⁴⁷ Mn	(-22260)	(382060)		(12290)	(-6700)	(17960)	(80)
⁴⁷ Fe	(-6600)	(365600)		(15600)	(-6900)	(15400)	(1500)
⁴⁸ S	(12100)	(362800)	(16900)			(3100)	
⁴⁸ Cl	(-4800)	(378900)	(18400)		(-16400)	(1600)	(19200)
⁴⁸ Ar	(-23200)	(396600)	(8900)		(-14800)	(5400)	(19300)
⁴⁸ K	-32124 24	404683 24	12090 24		-14560 220	4499 25	13510 100
⁴⁸ Ca	-44215 4	415991 4	278 5		-14378 20	9946 4	15807 7
⁴⁸ Sc	-44493 5	415487 5	3994 5		-11110 40	8233 5	9442 5
⁴⁸ Ti	-48487.0 10	418698.7 10			-9442.8 11	11626.59 4	11444.3 19
⁴⁸ V	-44475 3	413904 3		4012.3 24	-9084 3	10542 3	6831.9 24
⁴⁸ Cr	-42815 7	411462 7		1659 8	-7692 7	16334 16	8100 7
⁴⁸ Mn	(-29000)	(396860)		(13820)	(-7580)	(14810)	(1730)
⁴⁸ Fe	(-18110)	(385190)		(10890)	(-7000)	(19600)	(3140)
⁴⁸ Co	(1600)	(364700)		(19700)	(-7200)		(-1000)
⁴⁹ S	(20500)	(362500)	(20600)			(-300)	
⁴⁹ Cl	(-100)	(382300)	(16500)		(-16600)	(3400)	(19500)
⁴⁹ Ar	(-16600)	(398000)	(13700)		(-14200)	(1400)	(19100)
⁴⁹ K	-30320 70	410950 70	10970 70		-13800 700	6270 70	(14400)
⁴⁹ Ca	-41290 4	421138 4	5262 3		-14000 60	5146.6 4	16455 24
⁴⁹ Sc	-46552 4	425618 4	2006 4		-12369 11	10131 6	9627 3
⁴⁹ Ti	-48558.0 10	426841.1 10			-10170.4 11	8142.36 5	11354 5
⁴⁹ V	-47956.2 13	425456.9 13		601.9 8	-9311.8 13	11553 3	6758.1 8
⁴⁹ Cr	-45325 3	422044 3		2631 3	-8743 3	10581 8	8140 3
⁴⁹ Mn	-37611 24	413547 24		7715 24	-8160 30	(16680)	2084 25
⁴⁹ Fe	(-24580)	(399740)		(13030)	(-7600)	(14550)	(2870)
⁴⁹ Co	(-9600)	(383900)		(15000)	(-6900)	(19300)	(-1200)
⁵⁰ Cl	(7200)	(383100)	(20300)		(-17400)	(800)	(20600)
⁵⁰ Ar	(-13100)	(402600)	(12300)		(-15100)	(4600)	(20300)
⁵⁰ K	-25400 300	414100 300	14200 300		(-13000)	3100 300	(16000)
⁵⁰ Ca	-39571 9	427491 9	4966 17		-12280 40	6353 8	16540 70
⁵⁰ Sc	-44538 16	431674 16	6888 16		-11543 21	6057 15	10536 15
⁵⁰ Ti	-51425.8 10	437780.2 10			-10715.8 22	10939.13 4	12163 4
⁵⁰ V	-49217.5 13	434789.6 13	1036.9 4	2208.3 11	-9883.8 15	9332.7 14	7948.5 11
⁵⁰ Cr	-50254.5 13	435044.1 13			-8554.0 14	13000.3 22	9587.3 14
⁵⁰ Mn	-42621.5 14	426628.8 14		7633.0 3	-7972.5 18	13082 24	4585.0 22
⁵⁰ Fe	-34470 60	417700 60		8150 60	-7430 60	(17960)	4150 60
⁵⁰ Co	(-17200)	(399640)		(17280)	(-7250)	(15700)	(-100)
⁵⁰ Ni	(-3800)	(385500)		(13400)	(-7000)		(1500)
⁵¹ Cl	(12600)	(385700)	(18900)			(2700)	
⁵¹ Ar	(-6300)	(403900)	(15700)		(-15800)	(1300)	(20800)
⁵¹ K	(-22000)	(418800)	(13900)		(-13200)	(4700)	(16200)
⁵¹ Ca	-35890 90	431880 90	7330 90		-12400 140	4390 90	17800 300
⁵¹ Sc	-43219 20	438427 20	6508 20		-9947 21	6753 25	10936 22
⁵¹ Ti	-49726.9 13	444152.5 13	2470.6 15		-9812.1 23	6372.3 9	12478 16
⁵¹ V	-52197.5 13	445840.8 13			-10290.8 22	11051.28 9	8060.6 11
⁵¹ Cr	-51444.8 13	444305.8 13		752.73 24	-8937.9 11	9261.6 3	9516.19 25
⁵¹ Mn	-48237.0 13	440315.6 13		3207.8 5	-8657.9 15	13686.8 5	5271.5 4
⁵¹ Fe	-40217 15	431514 15		8020 15	-8090 21	13820 60	4885 15
⁵¹ Co	(-27270)	(417790)		(12940)	(-7440)	(18150)	(90)
⁵¹ Ni	(-11400)	(401200)		(15800)	(-7200)	(15700)	(1500)
⁵² Ar	(-1700)	(407300)	(14500)		(-16200)	(3500)	(21600)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁵² K	(-16200)	(421000)	(16300)		(-13800)	(2300)	(17200)
⁵² Ca	-32500 500	436600 500	7900 500		(-11700)	4700 500	(17800)
⁵² Sc	-40380 230	443660 230	9080 230		-10680 230	5230 230	11780 250
⁵² Ti	-49464 7	451961 7	1973 7		-7674 8	7808 7	13534 22
⁵² V	-51437.4 13	453152.1 13	3975.4 11		-9370 5	7311.24 23	8999.5 15
⁵² Cr	-55412.8 14	456345.1 14			-9350.7 14	12039.4 11	10504.3 11
⁵² Mn	-50701.1 24	450851.1 24		4711.7 20	-8651 3	10535.5 22	6545.4 22
⁵² Fe	-48329 10	447697 10		2372 10	-7939 13	16183 18	7381 10
⁵² Co	(-33920)	(432500)		(14410)	(-7340)	(14710)	(990)
⁵² Ni	(-22650)	(420460)		(11260)	(-6970)	(19300)	(2670)
⁵² Cu	(-2600)	(399600)		(20000)	(-6700)		(-1500)
⁵³ Ar	(5800)	(407900)	(17800)		(-17100)	(600)	
⁵³ K	(-12000)	(424900)	(15900)		(-14300)	(3900)	(17600)
⁵³ Ca	(-27900)	(440000)	(10100)		(-13700)	(3500)	(19000)
⁵³ Sc	(-38000)	(449300)	(8900)		(-10100)	(5700)	(12700)
⁵³ Ti	-46820 100	457390 100	5020 100		-7960 100	5430 100	13730 250
⁵³ V	-51845 3	461631 3	3436 3		-7717 5	8479 3	9670 8
⁵³ Cr	-55280.6 14	464284.3 14			-9147.5 14	7939.16 16	11132.2 11
⁵³ Mn	-54683.6 14	462904.9 14		597.0 4	-9152.4 16	12053.8 20	6559.8 4
⁵³ Fe	-50941.3 21	458380.2 21		3742.4 17	-8041 3	10683 10	7529 3
⁵³ Co	-42639 18	449296 18		8302 18	-7450 30	(16800)	1599 21
⁵³ Ni	(-29380)	(435250)		(13260)	(-7220)	(14800)	(2750)
⁵³ Cu	(-13500)	(418600)		(15900)	(-6300)	(18900)	(-1900)
⁵⁴ K	(-5600)	(426600)	(18000)		(-15200)	(1700)	(18700)
⁵⁴ Ca	(-23600)	(443800)	(10900)		(-12900)	(3800)	(18900)
⁵⁴ Sc	-34500 500	453900 500	11300 500		-11500 500	(4600)	(13900)
⁵⁴ Ti	-45760 230	464400 230	4120 230		-8620 230	7010 250	(15100)
⁵⁴ V	-49887 15	467744 15	7042 15		-7774 22	6113 15	10350 100
⁵⁴ Cr	-56928.3 14	474003.3 14			-7927.4 14	9719.01 25	12373 3
⁵⁴ Mn	-55551.3 17	471843.9 17	697.1 11	1377.1 10	-8758.7 15	8939.0 11	7559.6 10
⁵⁴ Fe	-56248.4 13	471758.7 13			-8418.9 10	13378.5 16	8853.8 6
⁵⁴ Co	-48005.3 13	462733.2 13		8243.08 22	-7808.8 10	13438 18	4353.0 16
⁵⁴ Ni	-39210 50	453150 50		8800 50	-7160 80	(17900)	3860 50
⁵⁴ Cu	(-21690)	(434860)		(17510)	(-6900)	(16300)	(-400)
⁵⁴ Zn	(-6600)	(418900)		(15100)	(-5200)		(400)
⁵⁵ K	(-600)	(429600)	(17500)		(-15600)	(3000)	
⁵⁵ Ca	(-18100)	(446400)	(12200)		(-14200)	(2600)	(19800)
⁵⁵ Sc	(-30300)	(457800)	(11500)		(-10800)	(3900)	(14000)
⁵⁵ Ti	-41810 240	468520 240	7300 300		-8300 300	4100 300	14600 500
⁵⁵ V	-49150 100	475080 100	5960 100		-8350 100	7330 100	10670 250
⁵⁵ Cr	-55103.3 14	480249.6 14	2603.1 5		-7801.4 17	6246.3 4	12506 15
⁵⁵ Mn	-57706.4 13	482070.3 13			-7933.8 10	10226.4 11	8067.0 4
⁵⁵ Fe	-57475.0 13	481056.6 13		231.38 10	-8455.2 10	9297.9 3	9212.7 11
⁵⁵ Co	-54023.7 14	476822.9 14		3451.3 4	-8211.7 10	14089.7 4	5064.3 3
⁵⁵ Ni	-45330 11	467347 11		8694 11	-7538 19	14200 50	4614 11
⁵⁵ Cu	(-31600)	(452900)		(13700)	(-6800)	(18000)	(-300)
⁵⁵ Zn	(-14920)	(435380)		(16700)	(-5900)	(16400)	(500)
⁵⁶ Ca	(-13200)	(449600)	(12200)		(-14000)	(3200)	(20000)
⁵⁶ Sc	(-25500)	(461000)	(13700)		(-11700)	(3200)	(14600)
⁵⁶ Ti	-39100 300	473900 300	7100 400		-9000 500	5400 400	(16100)
⁵⁶ V	-46240 240	480240 240	9050 240		-8300 300	5200 300	11700 300
⁵⁶ Cr	-55289 10	488506 10	1617 9		-8249 12	8257 9	13430 100
⁵⁶ Mn	-56905.6 14	489340.8 14	3695.5 3		-7893.0 11	7270.5 3	9091.2 6
⁵⁶ Fe	-60601.0 14	492253.9 14			-7613.1 5	11197.32 19	10183.59 17
⁵⁶ Co	-56035.0 24	486905.5 24		4566.0 20	-7759 3	10082.6 20	5849.0 20
⁵⁶ Ni	-53900 11	483988 11		2135 11	-7995 15	16641 16	7165 11
⁵⁶ Cu	(-38600)	(467910)		(15300)	(-7110)	(15000)	(560)
⁵⁶ Zn	(-25700)	(454300)		(12900)	(-5500)	(18900)	(1400)
⁵⁶ Ga	(-4700)	(432500)		(21000)	(-4500)		(-2900)
⁵⁷ Ca	(-7100)	(451500)	(14300)		(-15300)	(2000)	
⁵⁷ Sc	(-21400)	(465000)	(13200)		(-11800)	(4000)	(15400)
⁵⁷ Ti	(-34600)	(477400)	(9800)		(-9100)	(3500)	(16400)
⁵⁷ V	-44380 250	486450 250	8000 300		(-8800)	6200 300	12500 400
⁵⁷ Cr	-52390 90	493680 90	5090 90		-7990 140	5180 90	13400 300
⁵⁷ Mn	-57485 3	497991 3	2691 3		-8065 4	8651 3	9485 10
⁵⁷ Fe	-60175.7 14	499899.9 14			-7320.0 4	7646.03 10	10559.1 4
⁵⁷ Co	-59339.7 14	498281.5 14		836.0 4	-7081.0 7	11376.0 20	6027.6 4
⁵⁷ Ni	-56075 3	494235 3		3264 3	-7559 3	10247 11	7329 3
⁵⁷ Cu	-47305 16	484682 16		8770 16	-7091 24	(16780)	695 19
⁵⁷ Zn	(-32690)	(469280)		(14620)	(-5730)	(15000)	(1370)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁵⁷ Ga	(-15900)	(451700)		(16800)	(-4900)	(19200)	(-2500)
⁵⁸ Sc	(-15800)	(467500)	(15800)		(-12600)	(2500)	(15900)
⁵⁸ Ti	(-31600)	(482500)	(8800)		(-10400)	(5100)	(17500)
⁵⁸ V	-40400 <i>300</i>	490500 <i>300</i>	11600 <i>400</i>		-8300 <i>500</i>	4100 <i>400</i>	(13100)
⁵⁸ Cr	-51930 <i>240</i>	501290 <i>240</i>	3970 <i>240</i>		-8600 <i>300</i>	7600 <i>300</i>	14800 <i>300</i>
⁵⁸ Mn	-55900 <i>30</i>	504480 <i>30</i>	6250 <i>30</i>		-8440 <i>30</i>	6490 <i>30</i>	10800 <i>100</i>
⁵⁸ Fe	-62148.8 <i>14</i>	509944.4 <i>14</i>			-7645.4 <i>5</i>	10044.5 <i>3</i>	11953 <i>3</i>
⁵⁸ Co	-59841.4 <i>17</i>	506854.6 <i>17</i>	381.6 <i>12</i>	2307.4 <i>11</i>	-6715.1 <i>16</i>	8573.1 <i>11</i>	6954.7 <i>11</i>
⁵⁸ Ni	-60223.0 <i>14</i>	506453.8 <i>14</i>			-6399.5 <i>6</i>	12219 <i>3</i>	8172.3 <i>6</i>
⁵⁸ Cu	-51660 <i>3</i>	497108 <i>3</i>		8563.0 <i>21</i>	-6079.5 <i>22</i>	12426 <i>16</i>	2873 <i>3</i>
⁵⁸ Zn	-42290 <i>50</i>	486960 <i>50</i>		9370 <i>50</i>	-5510 <i>70</i>	(17680)	2280 <i>50</i>
⁵⁸ Ga	(-23990)	(467870)		(18310)	(-4700)	(16200)	(-1400)
⁵⁸ Ge	(-8400)	(451500)		(15600)	(-4200)		(-200)
⁵⁹ Sc	(-11100)	(470900)	(15000)		(-13000)	(3400)	
⁵⁹ Ti	(-26100)	(485100)	(11800)		(-10400)	(2600)	(17600)
⁵⁹ V	-37900 <i>300</i>	496100 <i>300</i>	9900 <i>400</i>		(-10000)	5600 <i>400</i>	(13600)
⁵⁹ Cr	-47850 <i>250</i>	505280 <i>250</i>	7620 <i>250</i>		-8500 <i>300</i>	4000 <i>300</i>	14800 <i>400</i>
⁵⁹ Mn	-55470 <i>30</i>	512120 <i>30</i>	5190 <i>30</i>		-8750 <i>100</i>	7640 <i>40</i>	10830 <i>240</i>
⁵⁹ Fe	-60658.4 <i>14</i>	516525.3 <i>14</i>	1565.2 <i>6</i>		-7980.0 <i>7</i>	6580.90 <i>20</i>	12050 <i>30</i>
⁵⁹ Co	-62223.6 <i>14</i>	517308.1 <i>14</i>			-6942.1 <i>6</i>	10453.5 <i>11</i>	7363.7 <i>6</i>
⁵⁹ Ni	-61151.1 <i>14</i>	515453.3 <i>14</i>		1072.5 <i>6</i>	-6101.0 <i>6</i>	8999.43 <i>14</i>	8598.7 <i>11</i>
⁵⁹ Cu	-56351.5 <i>17</i>	509871.3 <i>17</i>		4799.6 <i>9</i>	-4752.8 <i>11</i>	12762.9 <i>23</i>	3417.5 <i>9</i>
⁵⁹ Zn	-47260 <i>40</i>	499990 <i>40</i>		9090 <i>40</i>	-4350 <i>40</i>	13040 <i>60</i>	2890 <i>40</i>
⁵⁹ Ga	(-34120)	(486080)		(13140)	(-4900)	(18200)	(-880)
⁵⁹ Ge	(-17000)	(468200)		(17100)	(-4500)	(16700)	(300)
⁶⁰ Ti	(-22700)	(489800)	(10400)		(-11900)	(4600)	(18800)
⁶⁰ V	-33100 <i>600</i>	499400 <i>600</i>	13800 <i>600</i>		(-10000)	3200 <i>600</i>	(14200)
⁶⁰ Cr	-46800 <i>300</i>	512300 <i>300</i>	6100 <i>400</i>		-10100 <i>400</i>	7000 <i>400</i>	16200 <i>400</i>
⁶⁰ Mn	-52900 <i>300</i>	517600 <i>300</i>	8500 <i>300</i>		-9100 <i>400</i>	5500 <i>300</i>	12400 <i>400</i>
⁶⁰ Fe	-61407 <i>4</i>	525345 <i>4</i>	237 <i>3</i>		-8543 <i>10</i>	8820 <i>3</i>	13220 <i>30</i>
⁶⁰ Co	-61644.2 <i>14</i>	524800.1 <i>14</i>	2823.9 <i>5</i>		-7163.6 <i>7</i>	7491.93 <i>8</i>	8274.8 <i>6</i>
⁶⁰ Ni	-64468.1 <i>14</i>	526841.6 <i>14</i>			-6292.0 <i>6</i>	11388.3 <i>5</i>	9533.5 <i>5</i>
⁶⁰ Cu	-58341 <i>3</i>	519932 <i>3</i>		6126.9 <i>21</i>	-4731 <i>3</i>	10061.0 <i>23</i>	4479.0 <i>21</i>
⁶⁰ Zn	-54183 <i>11</i>	514992 <i>11</i>		4158 <i>11</i>	-2708 <i>15</i>	15000 <i>40</i>	5121 <i>11</i>
⁶⁰ Ga	(-40000)	(500030)		(14190)	(-3820)	(13950)	(30)
⁶⁰ Ge	(-27770)	(487010)		(12200)	(-4500)	(18800)	(900)
⁶⁰ As	(-6400)	(464900)		(21400)	(-4100)		(-3300)
⁶¹ Ti	(-16800)	(491900)	(13600)		(-12100)	(2100)	
⁶¹ V	(-30400)	(504700)	(12400)		(-11400)	(5400)	(15000)
⁶¹ Cr	-42800 <i>300</i>	516300 <i>300</i>	9000 <i>400</i>		(-10600)	4000 <i>400</i>	17000 <i>600</i>
⁶¹ Mn	-51700 <i>300</i>	524500 <i>300</i>	7200 <i>300</i>		-9800 <i>400</i>	6900 <i>400</i>	12200 <i>400</i>
⁶¹ Fe	-58917 <i>20</i>	530927 <i>20</i>	3978 <i>20</i>		-8950 <i>90</i>	5582 <i>20</i>	13300 <i>300</i>
⁶¹ Co	-62895.0 <i>16</i>	534122.2 <i>16</i>	1321.7 <i>9</i>		-7835 <i>3</i>	9322.2 <i>9</i>	8777 <i>4</i>
⁶¹ Ni	-64216.8 <i>14</i>	534661.6 <i>14</i>			-6466.0 <i>6</i>	7820.00 <i>13</i>	9861.5 <i>5</i>
⁶¹ Cu	-61979.6 <i>18</i>	531642.0 <i>18</i>		2237.2 <i>12</i>	-5064.8 <i>13</i>	11709.7 <i>24</i>	4800.4 <i>12</i>
⁶¹ Zn	-56342 <i>16</i>	525223 <i>16</i>		5637 <i>16</i>	-2692 <i>16</i>	10231 <i>19</i>	5290 <i>16</i>
⁶¹ Ga	(-47350)	(515450)		(9000)	(-2470)	(15420)	(450)
⁶¹ Ge	(-33700)	(501000)		(13600)	(-3500)	(14000)	(1000)
⁶¹ As	(-18100)	(484600)		(15700)	(-4600)	(19700)	(-2400)
⁶² V	(-25000)	(507400)	(16200)		(-11700)	(2700)	(15600)
⁶² Cr	-41200 <i>400</i>	522800 <i>400</i>	7300 <i>500</i>		(-12000)	6500 <i>500</i>	(18100)
⁶² Mn	-48500 <i>300</i>	529300 <i>300</i>	10400 <i>300</i>		-10500 <i>400</i>	4800 <i>400</i>	13000 <i>400</i>
⁶² Fe	-58898 <i>15</i>	538979 <i>15</i>	2530 <i>25</i>		-9390 <i>240</i>	8052 <i>25</i>	14500 <i>300</i>
⁶² Co	-61428 <i>20</i>	540727 <i>20</i>	5315 <i>20</i>		-7950 <i>40</i>	6604 <i>20</i>	9800 <i>30</i>
⁶² Ni	-66742.7 <i>14</i>	545258.8 <i>14</i>			-7018.8 <i>7</i>	10597.2 <i>5</i>	11136.6 <i>7</i>
⁶² Cu	-62795 <i>4</i>	540528 <i>4</i>		3948 <i>4</i>	-5378 <i>4</i>	8886 <i>4</i>	5867 <i>4</i>
⁶² Zn	-61167 <i>10</i>	538119 <i>10</i>		1627 <i>11</i>	-3369 <i>10</i>	12896 <i>19</i>	6477 <i>10</i>
⁶² Ga	-52000 <i>30</i>	528170 <i>30</i>		9170 <i>30</i>	-2760 <i>30</i>	(12720)	2940 <i>30</i>
⁶² Ge	(-42240)	(517630)		(9750)	(-2380)	(16600)	(2180)
⁶² As	(-25000)	(499600)		(17300)	(-3400)	(15000)	(-1500)
⁶³ V	(-21700)	(512200)	(13900)		(-12900)	(4700)	
⁶³ Cr	(-35500)	(525200)	(11200)		(-11800)	(2400)	(17800)
⁶³ Mn	-46800 <i>300</i>	535700 <i>300</i>	9000 <i>300</i>		-11300 <i>400</i>	6400 <i>400</i>	12900 <i>500</i>
⁶³ Fe	-55780 <i>190</i>	543930 <i>190</i>	6060 <i>190</i>		-10400 <i>300</i>	4950 <i>190</i>	14600 <i>300</i>
⁶³ Co	-61837 <i>20</i>	549207 <i>20</i>	3672 <i>20</i>		-8790 <i>40</i>	8480 <i>30</i>	10228 <i>25</i>
⁶³ Ni	-65509.2 <i>14</i>	552096.7 <i>14</i>	66.945 <i>5</i>		-7275.7 <i>7</i>	6837.85 <i>7</i>	11370 <i>20</i>
⁶³ Cu	-65576.2 <i>14</i>	551381.3 <i>14</i>			-5777.5 <i>5</i>	10853 <i>4</i>	6122.44 <i>7</i>
⁶³ Zn	-62209.3 <i>21</i>	547232.0 <i>21</i>		3366.9 <i>16</i>	-3483.1 <i>17</i>	9113 <i>10</i>	6704 <i>4</i>
⁶³ Ga	-56690 <i>100</i>	540930 <i>100</i>		5520 <i>100</i>	-2760 <i>100</i>	12760 <i>100</i>	2810 <i>100</i>

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁶³ Ge	(-46910)	(530370)		(9780)	(-2080)	(12740)	(2200)
⁶³ As	(-33800)	(516500)		(13100)	(-2100)	(16900)	(-1100)
⁶⁴ Cr	(-33300)	(531100)	(9800)		(-13100)	(5900)	(19000)
⁶⁴ Mn	-43100 <i>300</i>	540100 <i>300</i>	12000 <i>400</i>		-12500 <i>600</i>	4400 <i>400</i>	(14900)
⁶⁴ Fe	-55100 <i>300</i>	551300 <i>300</i>	4700 <i>300</i>		-10700 <i>400</i>	7400 <i>300</i>	15600 <i>400</i>
⁶⁴ Co	-59789 <i>20</i>	555230 <i>20</i>	7307 <i>20</i>		-9300 <i>300</i>	6020 <i>30</i>	11300 <i>190</i>
⁶⁴ Ni	-67095.9 <i>14</i>	561754.7 <i>14</i>			-8114 <i>3</i>	9658.01 <i>19</i>	12548 <i>20</i>
⁶⁴ Cu	-65420.8 <i>14</i>	559297.2 <i>14</i>	578.7 <i>9</i>	1675.10 <i>20</i>	-6201.5 <i>5</i>	7915.96 <i>11</i>	7200.55 <i>11</i>
⁶⁴ Zn	-65999.5 <i>17</i>	559093.6 <i>17</i>			-3956.3 <i>10</i>	11861.6 <i>15</i>	7712.3 <i>9</i>
⁶⁴ Ga	-58835 <i>4</i>	551146 <i>4</i>		7165 <i>4</i>	-2918 <i>4</i>	10220 <i>100</i>	3914 <i>4</i>
⁶⁴ Ge	-54420 <i>250</i>	545950 <i>250</i>		4410 <i>250</i>	-2670 <i>250</i>	(15600)	5000 <i>300</i>
⁶⁴ As	(-39500)	(530300)		(14900)	(-1900)	(13800)	(-100)
⁶⁵ Cr	(-27600)	(533500)	(13300)		(-13300)	(2300)	
⁶⁵ Mn	-40900 <i>600</i>	546000 <i>600</i>	10400 <i>600</i>		(-13000)	5900 <i>600</i>	(14800)
⁶⁵ Fe	-51300 <i>300</i>	555600 <i>300</i>	7900 <i>300</i>		-10900 <i>400</i>	4300 <i>400</i>	15500 <i>400</i>
⁶⁵ Co	-59164 <i>13</i>	562677 <i>13</i>	5958 <i>13</i>		-9900 <i>300</i>	7446 <i>24</i>	11400 <i>300</i>
⁶⁵ Ni	-65122.6 <i>15</i>	567852.7 <i>15</i>	2137.1 <i>10</i>		-8630 <i>20</i>	6098.01 <i>20</i>	12622 <i>20</i>
⁶⁵ Cu	-67259.7 <i>17</i>	569207.4 <i>17</i>			-6789.6 <i>12</i>	9910.2 <i>10</i>	7452.8 <i>10</i>
⁶⁵ Zn	-65907.8 <i>17</i>	567073.1 <i>17</i>		1351.9 <i>3</i>	-4115.9 <i>10</i>	7979.6 <i>5</i>	7775.9 <i>9</i>
⁶⁵ Ga	-62652.9 <i>18</i>	563035.9 <i>18</i>		3254.9 <i>9</i>	-3098.3 <i>10</i>	11890 <i>4</i>	3942.4 <i>7</i>
⁶⁵ Ge	-56410 <i>100</i>	556010 <i>100</i>		6240 <i>100</i>	-2490 <i>100</i>	10100 <i>300</i>	4860 <i>100</i>
⁶⁵ As	(-47100)	(545900)		(9400)	(-2100)	(15600)	(-100)
⁶⁵ Se	(-32900)	(531000)		(14100)	(-1600)	(13800)	(700)
⁶⁶ Mn	(-36500)	(549600)	(13800)		(-13900)	(3700)	(16200)
⁶⁶ Fe	-50300 <i>300</i>	562700 <i>300</i>	5700 <i>400</i>		-11600 <i>500</i>	7100 <i>400</i>	16700 <i>600</i>
⁶⁶ Co	-56100 <i>300</i>	567600 <i>300</i>	10000 <i>300</i>		-10000 <i>400</i>	5000 <i>300</i>	12100 <i>400</i>
⁶⁶ Ni	-66029 <i>16</i>	576830 <i>16</i>	226 <i>16</i>		-9556 <i>22</i>	8977 <i>16</i>	14153 <i>21</i>
⁶⁶ Cu	-66254.3 <i>17</i>	576273.4 <i>17</i>	2642.0 <i>12</i>		-7251 <i>20</i>	7065.93 <i>11</i>	8420.7 <i>10</i>
⁶⁶ Zn	-68896.3 <i>15</i>	578133.0 <i>15</i>			-4578.5 <i>8</i>	11059.8 <i>12</i>	8925.5 <i>12</i>
⁶⁶ Ga	-63721 <i>3</i>	572176 <i>3</i>		5175 <i>3</i>	-3352 <i>5</i>	9140 <i>3</i>	5103 <i>3</i>
⁶⁶ Ge	-61620 <i>30</i>	569290 <i>30</i>		2100 <i>30</i>	-2880 <i>30</i>	13280 <i>100</i>	6260 <i>30</i>
⁶⁶ As	(-51820)	(558710)		(9800)	(-2250)	(12800)	(2700)
⁶⁶ Se	(-41700)	(547800)		(10100)	(-1900)	(16900)	(2000)
⁶⁷ Mn	(-33700)	(554900)	(12900)		(-14500)	(5300)	
⁶⁷ Fe	-46600 <i>500</i>	567000 <i>500</i>	8700 <i>500</i>		(-13500)	4300 <i>600</i>	(17400)
⁶⁷ Co	-55300 <i>300</i>	575000 <i>300</i>	8400 <i>300</i>		-11000 <i>400</i>	7300 <i>400</i>	12300 <i>400</i>
⁶⁷ Ni	-63742 <i>19</i>	582615 <i>19</i>	3558 <i>21</i>		-10390 <i>190</i>	5785 <i>25</i>	15000 <i>300</i>
⁶⁷ Cu	-67300 <i>8</i>	585391 <i>8</i>	577 <i>8</i>		-7888 <i>22</i>	9117 <i>8</i>	8560 <i>18</i>
⁶⁷ Zn	-67877.2 <i>16</i>	585185.2 <i>16</i>			-4792.9 <i>8</i>	7052.2 <i>4</i>	8911.8 <i>13</i>
⁶⁷ Ga	-66876.7 <i>17</i>	583402.4 <i>18</i>		1000.5 <i>13</i>	-3725.4 <i>14</i>	11227 <i>3</i>	5269.4 <i>13</i>
⁶⁷ Ge	-62654 <i>5</i>	578397 <i>5</i>		4223 <i>5</i>	-2869 <i>5</i>	9100 <i>30</i>	6221 <i>6</i>
⁶⁷ As	-56640 <i>100</i>	571600 <i>100</i>		6010 <i>100</i>	-2380 <i>140</i>	(12890)	2310 <i>100</i>
⁶⁷ Se	(-46490)	(560670)		(10150)	(-2000)	(12800)	(2000)
⁶⁷ Br	(-32800)	(546200)		(13700)	(-1400)	(16900)	(-1600)
⁶⁸ Fe	(-44200)	(572700)	(7600)		(-13300)	(5700)	(17800)
⁶⁸ Co	-51800 <i>300</i>	579600 <i>300</i>	11700 <i>300</i>		-11200 <i>500</i>	4600 <i>400</i>	12500 <i>600</i>
⁶⁸ Ni	-63486 <i>17</i>	590430 <i>17</i>	2060 <i>50</i>		-10800 <i>300</i>	7815 <i>25</i>	15500 <i>300</i>
⁶⁸ Cu	-65540 <i>50</i>	591700 <i>50</i>	4460 <i>50</i>		-8180 <i>50</i>	6310 <i>50</i>	9090 <i>50</i>
⁶⁸ Zn	-70004.0 <i>16</i>	595383.4 <i>16</i>			-5333.0 <i>10</i>	10198.2 <i>5</i>	9993 <i>8</i>
⁶⁸ Ga	-67082.9 <i>20</i>	591679.9 <i>20</i>		2921.1 <i>12</i>	-4087.0 <i>15</i>	8277.6 <i>18</i>	6494.7 <i>13</i>
⁶⁸ Ge	-66977 <i>6</i>	590792 <i>6</i>		106 <i>6</i>	-3402 <i>6</i>	12395 <i>8</i>	7389 <i>6</i>
⁶⁸ As	-58880 <i>100</i>	581910 <i>100</i>		8100 <i>100</i>	-2470 <i>100</i>	10300 <i>140</i>	3510 <i>100</i>
⁶⁸ Se	(-54100)	(576400)		(4700)	(-2100)	(15700)	(4800)
⁶⁸ Br	(-38900)	(560400)		(15300)	(-1800)	(14200)	(-300)
⁶⁹ Fe	(-39400)	(576000)	(11600)		(-14200)	(3200)	
⁶⁹ Co	-51000 <i>400</i>	586800 <i>400</i>	9300 <i>400</i>		-12600 <i>700</i>	7300 <i>500</i>	(14100)
⁶⁹ Ni	-60380 <i>140</i>	595390 <i>140</i>	5360 <i>140</i>		-11500 <i>300</i>	4960 <i>140</i>	15800 <i>400</i>
⁶⁹ Cu	-65740 <i>8</i>	599973 <i>8</i>	2675 <i>8</i>		-9001 <i>15</i>	8270 <i>50</i>	9543 <i>18</i>
⁶⁹ Zn	-68414.9 <i>17</i>	601865.6 <i>17</i>	906 <i>3</i>		-5717.3 <i>11</i>	6482.2 <i>5</i>	10160 <i>50</i>
⁶⁹ Ga	-69321 <i>3</i>	601989 <i>3</i>			-4486 <i>3</i>	10309 <i>3</i>	6606 <i>3</i>
⁶⁹ Ge	-67094 <i>3</i>	598980 <i>3</i>		2227.3 <i>5</i>	-3611 <i>3</i>	8188 <i>7</i>	7300 <i>3</i>
⁶⁹ As	-63080 <i>30</i>	594180 <i>30</i>		4010 <i>30</i>	-2850 <i>30</i>	12270 <i>100</i>	3390 <i>30</i>
⁶⁹ Se	-56300 <i>30</i>	586620 <i>30</i>		6780 <i>40</i>	-2310 <i>110</i>	(10200)	4710 <i>110</i>
⁶⁹ Br	(-46400)	(575900)		(9900)	(-1800)	(15600)	(-450)
⁶⁹ Kr	(-32300)	(561100)		(14100)	(-1800)		(700)
⁷⁰ Co	(-46800)	(590600)	(12700)		(-12700)	(3800)	(14600)
⁷⁰ Ni	-59500 <i>300</i>	602600 <i>300</i>	3500 <i>300</i>		-11600 <i>500</i>	7200 <i>400</i>	15700 <i>500</i>
⁷⁰ Cu	-62960 <i>15</i>	605265 <i>15</i>	6599 <i>14</i>		-9300 <i>300</i>	5292 <i>16</i>	9870 <i>140</i>
⁷⁰ Zn	-69559 <i>3</i>	611081 <i>3</i>			-5956 <i>16</i>	9216 <i>3</i>	11108 <i>7</i>

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁷⁰ Ga	-68905 3	609644 3	1656 3	654.7 16	-5075 3	7655.1 8	7779 3
⁷⁰ Ge	-70560.3 17	610517.6 17			-4088.9 16	11538 3	8528 3
⁷⁰ As	-64340 50	603520 50		6220 50	-3040 50	9330 60	4540 50
⁷⁰ Se	(-61940)	(600330)		(2400)	(-2740)	(13710)	(6150)
⁷⁰ Br	(-51600)	(589200)		(10400)	(-2200)	(13300)	(2600)
⁷⁰ Kr	(-41000)	(577800)		(10600)	(-1700)	(16700)	(1900)
⁷¹ Co	(-45000)	(596900)	(10900)		(-13700)	(6300)	
⁷¹ Ni	-55900 400	607000 400	6900 400		-11700 600	4500 500	(16400)
⁷¹ Cu	-62760 40	613140 40	4560 40		-9900 300	7880 40	10600 300
⁷¹ Zn	-67322 11	616915 11	2815 11		-6004 21	5834 10	11650 17
⁷¹ Ga	-70136.8 18	618947.8 18			-5262 8	9303 3	7866 3
⁷¹ Ge	-69904.9 17	617933.5 17		231.9 3	-4452.6 16	7415.90 5	8289 3
⁷¹ As	-67892 4	615138 4		2013 4	-3440 4	11620 50	4621 4
⁷¹ Se	(-63090)	(609560)		(4800)	(-2860)	(9200)	(6040)
⁷¹ Br	(-56600)	(602300)		(6500)	(-2400)	(13100)	(1900)
⁷¹ Kr	(-46100)	(591000)		(10500)	(-2000)	(13200)	(1800)
⁷¹ Rb	(-32300)	(576400)		(13800)	(-1900)		(-1400)
⁷² Co	(-40600)	(600600)	(14100)			(3700)	
⁷² Ni	-54700 500	613900 500	(5400)		(-12900)	6900 600	(17000)
⁷² Cu	(-60060)	(618510)	(8070)		(-10700)	(5370)	(11500)
⁷² Zn	-68128 6	625793 6	458 6		-7067 18	8878 12	12650 40
⁷² Ga	-68586.5 20	625468.8 20	3999.1 23		-5470 50	6521.0 10	8554 11
⁷² Ge	-72585.6 15	628685.5 15			-5006.4 21	10752.0 20	9737.7 20
⁷² As	-68229 4	623547 4		4356 4	-3571 5	8409 6	5614 5
⁷² Se	-67894 12	622430 12		335 13	-3342 14	(12870)	7291 13
⁷² Br	-59200 300	612900 300		8700 300	-2700 300	(10600)	(3400)
⁷² Kr	-54100 300	607100 300		5040 80	(-2400)	(16100)	(4800)
⁷² Rb	(-38100)	(590300)		(16000)	(-1700)	(13900)	(-700)
⁷³ Ni	(-50200)	(617500)	(8900)		(-13200)	(3600)	(16900)
⁷³ Cu	(-59200)	(625700)	(6300)		(-10500)	(7200)	(11800)
⁷³ Zn	-65410 40	631150 40	4290 40		-7460 140	5350 40	(12640)
⁷³ Ga	-69704 6	634657 6	1593 6		-6389 10	9189 7	8864 9
⁷³ Ge	-71297.1 15	635468.4 15			-5307.1 21	6782.90 5	9999.6 23
⁷³ As	-70956 4	634345 4		341 4	-4060 5	10798 5	5660 4
⁷³ Se	-68216 11	630823 11		2740 10	-3548 11	8393 16	7276 11
⁷³ Br	-63530 130	625360 130		4680 130	-2880 140	12450 220	2930 130
⁷³ Kr	-56890 140	617930 140		6650 190	-3010 140	10800 300	5000 300
⁷³ Rb	(-46200)	(606500)		(10700)	(-2300)	(16200)	(-600)
⁷³ Sr	(-31700)	(591200)		(14500)	(-1800)		(900)
⁷⁴ Ni	(-48500)	(623900)	(7200)			(6400)	
⁷⁴ Cu	(-55700)	(630300)	(10000)		(-11400)	(4600)	(12800)
⁷⁴ Zn	-65710 50	639520 50	2340 90		-8600 300	8370 60	(13800)
⁷⁴ Ga	-68050 70	641080 70	5370 70		-7520 70	6420 70	9930 80
⁷⁴ Ge	-73422.0 15	645664.6 15			-6288 4	10196.20 6	11007 6
⁷⁴ As	-70859.6 22	642319.8 22	1353.0 18	2562.4 17	-4380 4	7975 4	6851.4 17
⁷⁴ Se	-72212.6 15	642890.5 15			-4077.2 21	12068 11	8545 4
⁷⁴ Br	-65306 15	635202 15		6907 15	-3390 50	9840 130	4379 18
⁷⁴ Kr	-62170 60	631280 60		3140 60	(-2650)	13360 150	5930 150
⁷⁴ Rb	-51700 700	620100 700		10400 700	(-2600)	(13600)	2100 700
⁷⁴ Sr	(-40700)	(608200)		(11000)	(-2100)	(17100)	(1800)
⁷⁵ Ni	(-43800)	(627300)	(10500)			(3400)	
⁷⁵ Cu	(-54300)	(637000)	(8200)		(-11800)	(6700)	(13100)
⁷⁵ Zn	-62470 70	644350 70	6000 70		-9000 400	4830 90	(14100)
⁷⁵ Ga	-68464 7	649560 7	3392 7		-8120 40	8480 70	10040 50
⁷⁵ Ge	-71855.9 15	652169.8 15	1176.5 10		-6959 11	6505.22 8	11090 70
⁷⁵ As	-73032.5 16	652564.0 17			-5320.5 22	10244.2 19	6899.4 9
⁷⁵ Se	-72168.8 15	650918.0 15		863.6 8	-4688.8 21	8027.53 8	8598.2 18
⁷⁵ Br	-69139 14	647106 14		3030 14	-3672 14	11904 20	4215 14
⁷⁵ Kr	-64242 15	641426 15		4897 21	(-3570)	10140 60	6225 22
⁷⁵ Rb	-57222 8	633625 8		7019 17	(-3100)	13600 700	2340 60
⁷⁵ Sr	(-46600)	(622300)		(10600)	(-3000)	(14000)	(2200)
⁷⁶ Ni	(-41600)	(633100)	(8700)			(5900)	
⁷⁶ Cu	(-50300)	(641000)	(11700)		(-12100)	(4100)	(13800)
⁷⁶ Zn	-62040 120	651990 120	4160 80		-9800 500	7650 140	(15000)
⁷⁶ Ga	-66200 90	655370 90	7010 90		(-8570)	5810 90	11020 110
⁷⁶ Ge	-73212.9 15	661598.1 15			-7509 6	9428.3 5	12038 7
⁷⁶ As	-72289.6 16	659892.4 17	2962.0 8	923.3 9	-6128.0 24	7328.44 7	7722.6 10
⁷⁶ Se	-75251.6 15	662072.1 15			-5090.9 6	11154.1 3	9508.1 8
⁷⁶ Br	-70289 9	656327 9		4963 9	-4484 10	9221 16	5409 9

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁷⁶ Kr	-68979 11	654235 11		1310 14	-3509 16	12808 16	7129 17
⁷⁶ Rb	-60481 8	644954 8		8498 13	-3800 300	11329 11	3528 17
⁷⁶ Sr	(-54400)	(638100)		(6100)	(-2700)	(15800)	(4500)
⁷⁷ Ni	(-36500)	(636100)	(12000)			(2900)	
⁷⁷ Cu	(-48500)	(647300)	(10100)			(6200)	(14200)
⁷⁷ Zn	-58600 130	656630 130	7270 120		(-10800)	4630 180	(15600)
⁷⁷ Ga	-65870 60	663110 60	5340 60		(-9100)	7740 110	11120 130
⁷⁷ Ge	-71214.1 18	667670.7 18	2702.0 21		-8230 40	6072.6 11	12300 90
⁷⁷ As	-73916.2 22	669590.4 22	682.9 18		-6637 6	9697.9 19	7992.3 18
⁷⁷ Se	-74599.0 15	669490.9 15			-5726.8 6	7418.81 7	9598.4 8
⁷⁷ Br	-73234 3	667343 3		1365 3	-4703 5	11017 10	5271 3
⁷⁷ Kr	-70171 9	663499 9		3063 9	-4380 14	9264 11	7172 13
⁷⁷ Rb	-64826 8	657371 8		5346 12	-3720 130	12417 10	3136 13
⁷⁷ Sr	-57970 150	649740 150		6850 150	-3510 200	(11700)	4780 150
⁷⁷ Y	(-46900)	(637900)		(11000)	(-3100)		(-200)
⁷⁸ Ni	(-33700)	(641400)	(10200)			(5300)	
⁷⁸ Cu	(-44000)	(650800)	(13300)			(3500)	(14800)
⁷⁸ Zn	-57220 160	663310 160	6440 140		(-11100)	6690 210	(16000)
⁷⁸ Ga	-63660 80	668970 80	8200 80		(-10400)	5860 100	12350 160
⁷⁸ Ge	-71862 4	676390 4	954 10		-8580 50	8719 4	13280 60
⁷⁸ As	-72816 10	676562 10	4209 10		-7190 70	6971 10	8891 10
⁷⁸ Se	-77025.7 15	679988.8 15			-6028.6 6	10498.0 3	10398.5 18
⁷⁸ Br	-73452 4	675633 4	708 8	3574 4	-5017 4	8289 5	6142 4
⁷⁸ Kr	-74160 7	675558 7			-4372 7	12060 7	8215 7
⁷⁸ Rb	-66936 8	667552 8		7224 10	-4055 17	10181 10	4053 12
⁷⁸ Sr	-63175 8	663008 8		3761 11	-3430 60	13270 150	5638 10
⁷⁸ Y	(-52600)	(651700)		(10500)	(-3300)	(13800)	(1900)
⁷⁹ Cu	(-41700)	(656600)	(11700)			(5800)	(15200)
⁷⁹ Zn	(-53400)	(667600)	(9090)		(-12000)	(4200)	(16700)
⁷⁹ Ga	-62490 120	675870 120	7000 80		(-10600)	6900 140	12550 200
⁷⁹ Ge	-69490 90	682090 90	4150 90		-9440 110	5700 90	13110 120
⁷⁹ As	-73636 6	685453 6	2281 5		-7597 9	8891 11	9063 7
⁷⁹ Se	-75916.9 15	686951.4 15	151.0 17		-6485.9 7	6962.6 3	10390 10
⁷⁹ Br	-76068.0 19	686320.1 19			-5460.4 18	10687 4	6331.3 16
⁷⁹ Kr	-74442 4	683912 4		1626 3	-4698 4	8354 8	8279 5
⁷⁹ Rb	-70797 7	679484 7		3646 8	-4083 15	11932 10	3926 7
⁷⁹ Sr	-65477 9	673383 9		5319 11	-3661 18	10374 11	5831 11
⁷⁹ Y	-58400 500	665500 500		7100 500	-3600 500	(13800)	2500 500
⁷⁹ Zr	(-47400)	(653700)		(11000)	(-3100)		(2000)
⁸⁰ Cu	(-35500)	(658500)	(16300)			(1900)	
⁸⁰ Zn	-51780 170	674010 170	7290 120		(-12600)	(6500)	(17400)
⁸⁰ Ga	-59070 120	680520 120	10380 120		(-11200)	4650 170	(13000)
⁸⁰ Ge	-69448 23	690118 23	2670 18		-9830 120	8030 90	14250 120
⁸⁰ As	-72118 21	692006 21	5641 21		-8340 90	6553 22	9920 90
⁸⁰ Se	-77759.4 19	696865.2 19			-6971.4 16	9913.8 16	11412 5
⁸⁰ Br	-75888.9 19	694212.3 19	2004 4	1870.6 3	-6024.2 18	7892.19 20	7260.9 16
⁸⁰ Kr	-77893 4	695434 4			-5067 4	11522 5	9114 4
⁸⁰ Rb	-72173 7	688932 7		5721 8	-4309 12	9448 9	5020 8
⁸⁰ Sr	-70305 8	686281 8		1868 10	-3751 13	12899 11	6797 10
⁸⁰ Y	(-61200)	(676400)		(9100)	(-3100)	(10900)	(3000)
⁸⁰ Zr	(-55400)	(669800)		(5800)	(-3400)	(16100)	(4300)
⁸¹ Zn	(-46100)	(676400)	(11900)		(-12100)	(2400)	(17900)
⁸¹ Ga	-57980 190	687510 190	8320 150		(-11900)	6990 230	13500 300
⁸¹ Ge	-66300 120	695040 120	6230 120		-10120 180	4930 120	14520 170
⁸¹ As	-72533 6	700492 6	3856 5		-9080 60	8486 22	10374 24
⁸¹ Se	-76389.1 20	703566.2 20	1585 3		-7599.9 20	6701.0 6	11560 21
⁸¹ Br	-77974 3	704369 3			-6483 3	10157 3	7504 3
⁸¹ Kr	-77694 3	703306 3		280.7 5	-5520 3	7872 3	9094 3
⁸¹ Rb	-75456 6	700287 6		2237 7	-4647 7	11355 9	4852 7
⁸¹ Sr	-71527 8	695574 8		3930 10	-3780 12	9293 11	6643 10
⁸¹ Y	-66020 60	689280 60		5510 60	-3620 60	(12900)	3000 60
⁸¹ Zr	-58900 300	681300 300		7200 300	-3300 300	(11600)	(5000)
⁸¹ Nb	(-47500)	(669200)		(11400)	(-3000)		(-600)
⁸² Zn	(-42100)	(680400)	(10900)		(-10800)	(4000)	
⁸² Ga	(-52900)	(690500)	(12700)		(-11400)	(3000)	(14100)
⁸² Ge	-65620 240	702440 240	4700 140		-10800 300	7400 300	14900 300
⁸² As	-70320 200	706350 200	7270 200		-9090 220	5860 200	11310 230
⁸² Se	-77593.4 21	712841.9 21			-8156 4	9275.7 13	12350 5
⁸² Br	-77496 3	711962 3	3092.6 15	97.5 24	-7105 10	7592.90 20	8396 3

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁸² Kr	-80589 3	714272 3			-5988 3	10966.2 15	9903.2 15
⁸² Rb	-76189 7	709090 7		4400 7	-5162 8	8804 9	5784 7
⁸² Sr	-76009 6	708128 6		180 9	-4274 9	12554 9	7841 8
⁸² Y	-68190 100	699530 100		7820 100	-3680 100	10250 120	3960 100
⁸² Zr	-64200 500	694700 500		4000 500	-3400 500	13400 600	5500 500
⁸² Nb	(-53000)	(682700)		(11200)	(-2800)	(13600)	(1400)
⁸³ Ga	(-49500)	(695200)	(11500)		(-10300)	(4600)	(14700)
⁸³ Ge	(-61000)	(705900)	(8900)		(-10000)	(3500)	(15300)
⁸³ As	-69880 220	713980 220	5460 220		-9820 250	7600 300	11500 300
⁸³ Se	-75340 4	718660 4	3669 5		-8280 90	5818 3	12310 200
⁸³ Br	-79009 4	721547 4	973 4		-7798 7	9584 5	8705 4
⁸³ Kr	-79982 3	721737 3			-6490 3	7465 4	9775 4
⁸³ Rb	-79073 6	720045 6		909 7	-5430 6	10955 9	5773 6
⁸³ Sr	-76797 9	716987 9		2276 6	-4780 9	8860 10	7897 11
⁸³ Y	-72330 40	711740 40		4470 40	-3960 40	12210 110	3610 40
⁸³ Zr	-66460 100	705090 100		5870 90	-3410 100	10300 500	5560 140
⁸³ Nb	-59000 300	696800 300		7500 300	-3000 500	(14100)	2100 600
⁸³ Mo	(-47700)	(684800)		(11200)	(-2800)		(2100)
⁸⁴ Ga	(-44400)	(698100)	(14000)		(-11300)	(3000)	
⁸⁴ Ge	(-58400)	(711400)	(7700)		(-9000)	(5500)	(16200)
⁸⁴ As	(-66100)	(718300)	(9900)		(-9400)	(4300)	(12400)
⁸⁴ Se	-75950 15	727341 15	1830 30		-8930 30	8681 15	13360 220
⁸⁴ Br	-77776 25	728385 25	4655 25		-8080 30	6840 30	9730 30
⁸⁴ Kr	-82431 3	732257 3			-7097 3	10520.5 19	10711 4
⁸⁴ Rb	-79750 3	728794 3	894 3	2680.9 23	-6286 3	8749 6	7057 3
⁸⁴ Sr	-80644 3	728906 3			-5176 5	11919 9	8861 7
⁸⁴ Y	-74160 90	721640 90		6490 90	-4410 90	9900 100	4650 90
⁸⁴ Zr	(-71490)	(718190)		(2670)	(-3610)	(13100)	(6450)
⁸⁴ Nb	(-61900)	(707800)		(9600)	(-3100)	(11000)	(2700)
⁸⁴ Mo	(-55800)	(700900)		(6100)	(-2900)	(16100)	(4100)
⁸⁵ Ge	(-53400)	(714400)	(10100)		(-9700)	(3100)	(16300)
⁸⁵ As	(-63500)	(723800)	(8900)		(-8000)	(5500)	(12400)
⁸⁵ Se	-72430 30	731890 30	6182 23		-8550 120	4550 30	(13600)
⁸⁵ Br	-78611 19	737291 19	2870 19		-8503 20	8910 30	9950 24
⁸⁵ Kr	-81481 3	739378 3	687.1 19		-7516 3	7121 4	10990 30
⁸⁵ Rb	-82167.7 23	739283.1 23			-6618 3	10489 3	7026 3
⁸⁵ Sr	-81103 3	737436 3		1065 3	-5834 4	8530 4	8641 4
⁸⁵ Y	-77848 25	733398 25		3255 25	-4820 30	11760 90	4492 25
⁸⁵ Zr	-73150 100	727920 100		4690 100	-4050 100	(9730)	6290 140
⁸⁵ Nb	-67150 220	721140 220		6000 200	-3560 230	(13300)	(3000)
⁸⁵ Mo	(-59100)	(712300)		(8100)	(-2600)	(11300)	(4500)
⁸⁵ Tc	(-47600)	(700000)		(11500)	(-2500)		(-1000)
⁸⁶ Ge	(-50000)	(719100)	(9400)		(-10400)	(4700)	
⁸⁶ As	(-59400)	(727700)	(11100)		(-8900)	(4000)	(13300)
⁸⁶ Se	-70541 16	738075 16	5099 11		-7340 240	6180 30	(14300)
⁸⁶ Br	-75640 11	742391 11	7626 11		-7740 200	5101 22	10500 30
⁸⁶ Kr	-83265.9 11	749235.0 11			-8097.4 23	9857 3	11944 19
⁸⁶ Rb	-82747.3 23	747934.0 23	1774.2 14	519 3	-7676 3	8651.0 10	8555.7 22
⁸⁶ Sr	-84521.6 22	748925.9 22			-6358 3	11490 3	9642.8 16
⁸⁶ Y	-79282 14	742904 14		5240 14	-5517 16	9510 30	5468 14
⁸⁶ Zr	-77810 30	740640 30		1480 30	-4220 30	12720 110	7250 40
⁸⁶ Nb	-69830 90	731880 90		7980 80	-4060 130	10740 240	3960 130
⁸⁶ Mo	-64600 400	725800 400		5300 400	-2800 700	(13600)	4700 500
⁸⁶ Tc	(-53200)	(713700)		(11400)	(-2700)	(13700)	(1400)
⁸⁷ As	(-56300)	(732700)	(10300)		(-9200)	(5000)	(13500)
⁸⁷ Se	-66580 40	742190 40	7280 40		(-8000)	4110 40	(14500)
⁸⁷ Br	-73857 18	748680 18	6853 18		-6400 220	6289 21	10606 24
⁸⁷ Kr	-80710.0 13	754750.4 13	3885 3		-7795 4	5515.4 8	12359 11
⁸⁷ Rb	-84595.0 25	757853.1 25	283.3 15		-8011 5	9919.0 20	8618 3
⁸⁷ Sr	-84878.4 22	757354.0 22			-7321 3	8428.12 17	9420.0 14
⁸⁷ Y	-83017 3	754710 3		1861.6 14	-6369 6	11807 14	5784.2 14
⁸⁷ Zr	-79348 8	750259 8		3669 8	-4976 12	9610 30	7355 16
⁸⁷ Nb	-74180 60	744310 60		5170 60	-4280 70	12430 100	3670 70
⁸⁷ Mo	-67690 220	737040 220		6490 210	-3660 240	11200 500	5160 240
⁸⁷ Tc	(-59100)	(727700)		(8600)	(-2600)	(14000)	(1900)
⁸⁷ Ru	(-47300)	(715100)		(11800)	(-2000)		(1400)
⁸⁸ As	(-51600)	(736100)	(12200)		(-9700)	(3400)	
⁸⁸ Se	-63880 50	747550 50	6850 30		(-7900)	5370 60	(14900)
⁸⁸ Br	-70730 40	753630 40	8960 40		(-7100)	4950 40	11440 50

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁸⁸ Kr	-79692 13	761804 13	2914 14		-6167 20	7053 13	13124 22
⁸⁸ Rb	-82606 4	763936 4	5313 4		-7250 30	6083 4	9185 5
⁸⁸ Sr	-87919.7 22	768466.6 22			-7914 3	11112.63 22	10613.6 15
⁸⁸ Y	-84297 3	764062 3		3622.6 15	-6972 3	9351.6 20	6707.7 15
⁸⁸ Zr	-83624 10	762606 10		673 10	-5404 11	12347 13	7896 10
⁸⁸ Nb	(-76420)	(754620)		(7200)	(-4690)	(10310)	(4370)
⁸⁸ Mo	-72701 20	750118 20		(3720)	(-3630)	13080 220	5810 60
⁸⁸ Tc	(-62600)	(739200)		(10100)	(-3100)	(11500)	(2200)
⁸⁸ Ru	(-55500)	(731400)		(7100)	(-2100)	(16200)	(3700)
⁸⁹ As	(-47300)	(739800)	(12300)			(3700)	
⁸⁹ Se	(-59600)	(751300)	(9000)		(-8600)	(3800)	(15200)
⁸⁹ Br	-68570 60	759540 60	8160 30		(-7500)	5910 70	11980 80
⁸⁹ Kr	-76720 50	766910 50	4990 50		-6720 60	5100 50	13280 60
⁸⁹ Rb	-81711 6	771111 6	4496 5		-5525 20	7176 7	9308 15
⁸⁹ Sr	-86207.0 22	774825.4 22	1495.1 22		-7151 3	6358.71 13	10890 4
⁸⁹ Y	-87702.1 23	775538.1 23			-7959 3	11476 3	7071.4 22
⁸⁹ Zr	-84869 3	771923 3		2833 3	-6192 4	9317 10	7861 4
⁸⁹ Nb	-80580 40	766850 40		4290 40	-5160 40	(12230)	4240 40
⁸⁹ Mo	-75003 15	760492 15		5580 40	-4270 100	10374 25	(5870)
⁸⁹ Tc	-67490 210	752200 210		7510 210	-2800 300	(13000)	2080 210
⁸⁹ Ru	(-59500)	(743400)		(8000)	(-2900)	(12100)	(4200)
⁸⁹ Rh	(-47200)	(730300)		(12400)	(-2000)		(-1100)
⁹⁰ Se	(-56400)	(756200)	(8200)		(-8800)	(4900)	(16400)
⁹⁰ Br	-64610 80	763650 80	10350 80		(-7600)	4110 100	(12300)
⁹⁰ Kr	-74963 19	773217 19	4392 17		-6847 25	6310 60	13680 60
⁹⁰ Rb	-79355 8	776827 8	6587 8		-6140 14	5716 10	9920 50
⁹⁰ Sr	-85942 3	782632 3	546.0 14		-5101 3	7806 3	11520 6
⁹⁰ Y	-86487.9 23	782395.1 23	2280.1 16		-6165.5 25	6857.08 15	7569.8 22
⁹⁰ Zr	-88767.9 22	783892.9 22			-6671.3 24	11970 3	8354.8 16
⁹⁰ Nb	-82657 5	777000 5		6111 4	-5800 15	10150 40	5076 5
⁹⁰ Mo	-80168 6	773728 6		2489 4	-4790 30	13236 16	6880 40
⁹⁰ Tc	-71210 240	763990 240		8960 240	-3800 300	11800 300	3490 240
⁹⁰ Ru	(-65400)	(757400)		(5800)	(-3300)	(14000)	(5200)
⁹⁰ Rh	(-53200)	(744400)		(12200)	(-2400)	(14100)	(1000)
⁹¹ Se	(-50900)	(758800)	(10600)			(2500)	
⁹¹ Br	-61510 70	768620 70	9800 40		(-7700)	4970 110	(12400)
⁹¹ Kr	-71310 60	777640 60	6440 60		-7160 70	4420 60	13990 100
⁹¹ Rb	-77748 8	783291 8	5891 9		-6315 20	6464 11	10074 20
⁹¹ Sr	-83639 6	788400 6	2707 6		-5354 6	5768 6	11573 10
⁹¹ Y	-86346 3	790325 3	1544.8 18		-4176 3	7929.8 25	7693 3
⁹¹ Zr	-87891.1 22	791087.4 22			-5437.7 24	7194.5 5	8692.2 17
⁹¹ Nb	-86638 3	789052 3		1253.4 24	-6046 4	12052 5	5158.8 24
⁹¹ Mo	-82204 11	783835 11		4434 11	-5281 14	10107 13	6836 12
⁹¹ Tc	-75980 200	776830 200		6220 200	-4230 210	12800 300	3100 200
⁹¹ Ru	-68600 500	768600 500		7400 500	-3300 500	(11200)	4700 600
⁹¹ Rh	(-59100)	(758400)		(9500)	(-2400)	(14000)	(1000)
⁹¹ Pd	(-47100)	(745600)		(12000)	(-2100)		(1100)
⁹² Se	(-47200)	(763200)	(9400)			(4400)	
⁹² Br	-56580 50	771760 50	12200 50		(-7400)	3140 90	(13000)
⁹² Kr	-68788 12	783185 12	5987 10		-7340 50	5550 60	14570 70
⁹² Rb	-74775 7	788390 7	8100 7		-6470 40	5099 10	10750 60
⁹² Sr	-82875 7	795707 7	1940 10		-5608 15	7307 8	12416 10
⁹² Y	-84815 9	796865 9	3639 9		-4634 10	6540 9	8465 11
⁹² Zr	-88454.6 21	799722.1 22			-2959.8 24	8634.8 3	9397.2 19
⁹² Nb	-86449 3	796934 3	357 4	2005.6 18	-4577 3	7883 3	5846.8 18
⁹² Mo	-86805 4	796508 4			-5607 11	12673 11	7457 4
⁹² Tc	-78940 30	787860 30		7870 30	(-4940)	11020 200	4020 30
⁹² Ru	(-74400)	(782500)		(4500)	(-4100)	(13900)	(5700)
⁹² Rh	(-63400)	(770700)		(11000)	(-3200)	(12300)	(2100)
⁹² Pd	(-55500)	(762100)		(7900)	(-2400)	(16500)	(3700)
⁹³ Br	(-53000)	(776300)	(11000)		(-8100)	(4500)	(13100)
⁹³ Kr	-64030 100	786490 100	8600 100		(-6900)	3310 100	14730 110
⁹³ Rb	-72626 8	794312 8	7462 9		-6480 60	5922 10	11127 14
⁹³ Sr	-80088 8	800991 8	4137 12		-5790 50	5284 10	12601 10
⁹³ Y	-84224 11	804345 11	2893 10		-4938 12	7480 14	8638 12
⁹³ Zr	-87117.4 21	806456.3 22	91.4 16		-3335.2 24	6734.1 6	9591 9
⁹³ Nb	-87208.7 22	805765.3 22			-1931.6 22	8831.1 20	6043.1 16
⁹³ Mo	-86804 4	804578 4		405 3	-4359 5	8069.71 9	7644 4
⁹³ Tc	-83603 4	800595 4		3200.9 10	-5450 40	12740 30	4086.5 10
⁹³ Ru	-77270 90	793480 90		6340 90	-4690 90	(10900)	5620 90

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁹³ Rh	(-69200)	(784600)		(8100)	(-4100)	(13900)	(2100)
⁹³ Pd	(-59700)	(774300)		(9500)	(-2600)	(12300)	(3600)
⁹⁴ Br	(-47800)	(779100)	(13300)			(2900)	
⁹⁴ Kr	(-61100)	(791700)	(7400)		(-7100)	(5200)	(15400)
⁹⁴ Rb	-68551.9	798308.9	10291.10		-6360.80	3996.11	11810.100
⁹⁴ Sr	-78842.7	807817.7	3508.8		-6304.20	6826.10	13505.10
⁹⁴ Y	-82350.8	810542.8	4917.7		-5420.11	6197.13	9551.11
⁹⁴ Zr	-87266.323	814676.523			-3749.3	8220.219	10331.11
⁹⁴ Nb	-86364.922	812992.822	2045.419	901.422	-2301.922	7227.479	6536.516
⁹⁴ Mo	-88410.318	814255.818			-2067.321	9678.4	8490.619
⁹⁴ Tc	-84155.4	809218.4		4256.4	-3923.6	8623.6	4640.5
⁹⁴ Ru	-82568.13	806849.13		1587.13	-4825.14	13370.90	6254.13
⁹⁴ Rh	(-72900)	(796400)		(9600)	(-4200)	(11800)	(3000)
⁹⁴ Pd	(-66400)	(789100)		(6600)	(-3400)	(14700)	(4500)
⁹⁴ Ag	(-53300)	(775200)		(13100)	(-2500)		(900)
⁹⁵ Kr	(-56000)	(794700)	(9800)		(-7600)	(3000)	(15500)
⁹⁵ Rb	-65839.19	803667.19	9279.19		-6750.80	5359.20	(12000)
⁹⁵ Sr	-75117.8	812164.8	6087.8		-6230.60	4347.10	13855.11
⁹⁵ Y	-81204.8	817468.8	4453.7		-5881.11	6926.10	9651.10
⁹⁵ Zr	-85657.623	821139.123	1124.819		-4444.6	6462.79	10597.8
⁹⁵ Nb	-86782.519	821481.619	925.65		-2861.3	8488.920	6805.120
⁹⁵ Mo	-87708.118	821624.918			-2241.920	7369.0610	8632.219
⁹⁵ Tc	-86017.5	819152.5		1691.5	-1805.6	9934.7	4896.5
⁹⁵ Ru	-83450.12	815802.12		2567.13	-3671.16	8953.14	6584.13
⁹⁵ Rh	-78340.150	809910.150		5110.150	-4780.250	(13500)	3060.150
⁹⁵ Pd	(-70200)	(800900)		(8200)	(-4000)	(11900)	(4500)
⁹⁵ Ag	(-60100)	(790100)		(10100)	(-3400)	(14900)	(1000)
⁹⁶ Kr	(-53000)	(799700)	(8200)		(-8300)	(5100)	
⁹⁶ Rb	-61210.30	807110.30	11740.30		-7060.60	3450.30	(12500)
⁹⁶ Sr	-72954.25	818072.25	5387.15		-6590.30	5908.25	14400.30
⁹⁶ Y	-78341.22	822676.22	7100.22		-5990.23	5208.23	10512.23
⁹⁶ Zr	-85441.3	828994.3	164.4		-4990.7	7854.3	11525.8
⁹⁶ Nb	-85604.4	828375.4	3187.3		-3214.10	6893.3	7236.4
⁹⁶ Mo	-88791.018	830779.218			-2761.420	9154.265	9297.55
⁹⁶ Tc	-85818.5	827024.5	254.10	2973.5	-1794.6	7872.7	5399.5
⁹⁶ Ru	-86072.8	826496.8			-1692.9	10694.10	7344.9
⁹⁶ Rh	-79626.13	819267.13		6446.10	-3120.30	9360.150	3465.14
⁹⁶ Pd	-76180.150	815030.150		3450.150	(-4200)	(14100)	5120.210
⁹⁶ Ag	(-64600)	(802600)		(11600)	(-3600)	(12500)	(1700)
⁹⁶ Cd	(-56100)	(793400)		(8500)	(-3000)		(3300)
⁹⁷ Kr	(-47900)	(802700)	(10400)			(3000)	
⁹⁷ Rb	-58360.30	812340.30	10430.30		(-7800)	5220.30	(12600)
⁹⁷ Sr	-68792.19	821981.19	7468.16		-7190.100	3910.30	14870.30
⁹⁷ Y	-76260.12	828667.12	6688.11		-6059.14	5991.24	10600.30
⁹⁷ Zr	-82949.3	834573.3	2658.119		-5286.8	5580.3	11897.22
⁹⁷ Nb	-85607.3	836449.3	1933.919		-3808.11	8074.4	7455.3
⁹⁷ Mo	-87540.818	837600.318			-2848.420	6821.1425	9226.3
⁹⁷ Tc	-87221.4	836498.5		320.4	-2437.5	9474.7	5719.4
⁹⁷ Ru	-86112.8	834607.8		1108.9	-1733.9	8112.3	7584.10
⁹⁷ Rh	-82590.40	830300.40		3520.40	-1410.40	11030.40	3810.40
⁹⁷ Pd	-77800.300	824700.300		4800.300	-3000.300	9700.300	5500.300
⁹⁷ Ag	(-70800)	(816900)		(7000)	(-4000)	(14300)	(1900)
⁹⁷ Cd	(-60600)	(806000)		(10200)	(-3300)	(12600)	(3300)
⁹⁸ Rb	-54300.30	816350.30	12326.24		(-8900)	4010.40	(13700)
⁹⁸ Sr	-66630.30	827890.30	5823.10		(-7900)	5910.30	15550.40
⁹⁸ Y	-72452.24	832930.24	8824.15		-6326.25	4260.30	10950.30
⁹⁸ Zr	-81276.20	840972.20	2250.20		-4859.21	6399.20	12305.22
⁹⁸ Nb	-83526.6	842440.6	4586.6		-3602.9	5991.6	7867.6
⁹⁸ Mo	-88112.018	846242.818			-3270.620	8642.507	9794.019
⁹⁸ Tc	-86428.4	843776.4	1796.7	1684.3	-2488.4	7279.5	6176.3
⁹⁸ Ru	-88224.6	844791.6			-2239.6	10183.10	8293.8
⁹⁸ Rh	-83167.12	838951.12		5057.10	-1437.13	8650.40	4344.14
⁹⁸ Pd	-81300.21	836301.21		1867.24	-1157.22	11600.300	6000.40
⁹⁸ Ag	-72880.150	827100.150		8420.150	(-2400)	(10200)	2400.300
⁹⁸ Cd	(-67460)	(820900)		(5420)	(-3500)	(14900)	(4000)
⁹⁸ In	(-53800)	(806500)		(13700)	(-2900)		(500)
⁹⁹ Rb	-50840.150	820950.150	11280.110			4610.150	
⁹⁹ Sr	-62120.140	831450.140	8090.140		(-8500)	3560.140	15100.140
⁹⁹ Y	-70202.24	838751.24	7567.14		-6790.30	5820.30	10860.40

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
⁹⁹ Zr	-77769.20	845536.20	4558.15		-5077.21	4560.30	12610.30
⁹⁹ Nb	-82327.13	849312.13	3639.13		-3548.15	6872.14	8340.24
⁹⁹ Mo	-85966.118	852168.218	1357.210		-2733.419	5925.3915	9729.6
⁹⁹ Tc	-87323.319	852743.119	293.714		-2965.811	8967.3	6500.310
⁹⁹ Ru	-87617.020	852254.420			-2333.816	7464.7	8478.4
⁹⁹ Rh	-85574.7	849429.7		2043.7	-1982.9	10479.14	4639.9
⁹⁹ Pd	-82188.15	845261.15		3387.15	-1163.18	8959.25	6310.19
⁹⁹ Ag	-76760.150	839050.150		5430.150	-840.210	11950.210	2750.150
⁹⁹ Cd	(-69850)	(831360)		(6910)	(-2100)	(10500)	(4300)
⁹⁹ In	(-60900)	(821600)		(8900)	(-3200)	(15200)	(700)
¹⁰⁰ Rb	(-46700)	(824900)	(13500)			(3900)	
¹⁰⁰ Sr	-60220.130	837620.130	7080.100		(-9600)	6170.190	16670.200
¹⁰⁰ Y	-67290.80	843910.80	9310.70		-8510.80	5160.80	12470.160
¹⁰⁰ Zr	-76600.40	852440.40	3335.25		-6080.40	6910.40	13690.40
¹⁰⁰ Nb	-79940.30	855000.30	6245.25		-4020.30	5680.30	9460.30
¹⁰⁰ Mo	-86184.6	860458.6			-3169.6	8290.6	11146.12
¹⁰⁰ Tc	-86016.422	859507.522	3202.417	168.6	-2837.3	6764.410	7339.314
¹⁰⁰ Ru	-89218.820	861927.520			-2852.716	9673.1614	9184.514
¹⁰⁰ Rh	-85589.20	857515.20		3630.20	-2196.21	8086.21	5261.20
¹⁰⁰ Pd	-85227.11	856371.11		361.23	-1580.13	11111.19	6942.13
¹⁰⁰ Ag	-78180.80	848540.80		7050.80	-980.80	9490.170	3280.80
¹⁰⁰ Cd	-74310.100	843880.100		3880.70	-550.180	(12520)	4840.180
¹⁰⁰ In	-64100.400	832900.400		10200.400	(-2000)	(11300)	(1600)
¹⁰⁰ Sn	(-56900)	(824900)		(7270)	(-3200)		(3200)
¹⁰¹ Rb	-43600.170	829850.170	11810.110			(5000)	
¹⁰¹ Sr	-55410.120	840880.120	9510.80		(-9900)	3260.180	(16000)
¹⁰¹ Y	-64910.100	849600.100	8550.90		-8970.100	5690.120	11980.160
¹⁰¹ Zr	-73460.30	857370.30	5485.25		-7090.40	4920.50	13450.80
¹⁰¹ Nb	-78943.19	862070.19	4569.18		-5107.22	7070.30	9630.40
¹⁰¹ Mo	-83512.6	865856.6	2824.24		-2988.6	5398.5020	10861.25
¹⁰¹ Tc	-86336.24	867899.24	1613.24		-3154.24	8391.24	7441.24
¹⁰¹ Ru	-87949.620	868729.620			-2833.717	6802.17	9222.218
¹⁰¹ Rh	-87408.17	867406.17		541.17	-2612.18	9890.30	5478.17
¹⁰¹ Pd	-85428.18	864643.18		1980.4	-1741.20	8272.21	7130.30
¹⁰¹ Ag	-81220.100	859660.100		4200.100	-1060.110	11110.130	3290.100
¹⁰¹ Cd	-75750.150	853400.150		5480.110	-400.300	9510.180	4860.170
¹⁰¹ In	(-68400)	(845300)		(7300)	(-0)	(12300)	(1400)
¹⁰¹ Sn	(-59600)	(835600)		(8800)	(-1400)	(10800)	(2700)
¹⁰² Rb	(-38000)	(832300)	(15100)			(2500)	
¹⁰² Sr	-53080.110	846620.110	8820.70			5740.170	16770.200
¹⁰² Y	-61890.90	854660.90	9850.70		-10010.90	5050.130	13770.150
¹⁰² Zr	-71740.50	863720.50	4610.30		-7540.60	6360.60	14120.110
¹⁰² Nb	-76350.40	867550.40	7210.40		-6320.50	5480.40	10180.50
¹⁰² Mo	-83558.21	873974.21	1010.23		-4710.30	8117.20	11900.30
¹⁰² Tc	-84568.9	874201.9	4530.9		-3466.11	6300.30	8345.10
¹⁰² Ru	-89097.920	877949.320			-3410.817	9219.595	10051.24
¹⁰² Rh	-86775.5	874844.5	1151.5	2323.5	-2772.6	7439.18	6115.5
¹⁰² Pd	-87926.3	875213.3			-2126.7	10569.18	7807.17
¹⁰² Ag	-81970.70	868480.70		5950.70	-1230.70	8820.130	3830.70
¹⁰² Cd	-79380.70	865110.70		2587.8	-510.70	11710.170	5450.130
¹⁰² In	-70100.400	855100.400		9300.400	300.400	(9800)	1700.400
¹⁰² Sn	(-64700)	(848900)		(5400)	(300)	(13300)	(3600)
¹⁰³ Sr	(-47600)	(849200)	(11200)			(2500)	(16800)
¹⁰³ Y	(-58700)	(859600)	(9600)		(-10300)	(4900)	(13000)
¹⁰³ Zr	-68370.110	868430.110	6950.90		-8680.180	4700.120	13770.140
¹⁰³ Nb	-75320.70	874590.70	5530.30		-7540.70	7040.80	10870.80
¹⁰³ Mo	-80850.60	879340.60	3750.60		-5500.60	5360.60	11790.70
¹⁰³ Tc	-84599.10	882304.10	2660.10		-4697.17	8103.13	8331.23
¹⁰³ Ru	-87258.920	884181.621	763.421		-3717.817	6232.43	9980.9
¹⁰³ Rh	-88022.3	884163.3			-3124.3	9318.5	6213.421
¹⁰³ Pd	-87479.3	882837.3		543.18	-2287.124	7624.715	7993.5
¹⁰³ Ag	-84792.17	879367.17		2688.17	-1642.18	10890.70	4155.17
¹⁰³ Cd	-80650.15	874443.15		4142.10	-887.22	9340.70	5970.70
¹⁰³ In	-74600.25	867611.25		6050.20	-270.150	12500.400	2500.70
¹⁰³ Sn	(-66900)	(859200)		(7700)	(500)	(10300)	(4100)
¹⁰³ Sb	(-55800)	(847200)		(11200)	(2700)		(-1700)
¹⁰⁴ Sr	(-44400)	(854100)	(10100)			(4900)	
¹⁰⁴ Y	(-54500)	(863400)	(11800)		(-10300)	(3900)	(14300)
¹⁰⁴ Zr	(-66300)	(874500)	(5900)		(-8500)	(6000)	(14900)
¹⁰⁴ Nb	-72230.110	879570.110	8110.90		-7360.130	4980.130	11140.150

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁰⁴ Mo	-80330 60	886890 60	2160 40		-6150 70	7560 90	12300 90
¹⁰⁴ Tc	-82490 50	888260 50	5600 50		-4970 50	5960 50	8930 80
¹⁰⁴ Ru	-88091 4	893085 4			-4332 7	8904 3	10781 9
¹⁰⁴ Rh	-86950 3	891162 3	2441 5	1141 4	-3359 3	6999.05 6	6980.0 21
¹⁰⁴ Pd	-89391 5	892820 5			-2597 5	9983 5	8658 5
¹⁰⁴ Ag	-85112 6	887759 6		4279 4	-1948 21	8392 18	4922 7
¹⁰⁴ Cd	-83976 10	885841 10		1136 11	-1173 15	11398 17	6473 18
¹⁰⁴ In	-76070 140	877150 140		7910 140	-310 160	9540 140	2710 140
¹⁰⁴ Sn	-71550 150	871850 150		4520 60	330 180	(12700)	4240 160
¹⁰⁴ Sb	(-59300)	(858900)		(12200)	(2400)	(11600)	(-310)
¹⁰⁵ Y	(-51100)	(868100)	(11200)		(-10000)	(4700)	(14000)
¹⁰⁵ Zr	(-62400)	(878600)	(8500)		(-9400)	(4100)	(15100)
¹⁰⁵ Nb	-70850 100	886270 100	6490 70		-8370 140	6700 150	(11800)
¹⁰⁵ Mo	-77340 70	891970 70	4950 50		-6310 80	5080 90	12400 130
¹⁰⁵ Tc	-82290 60	896140 60	3640 60		-5770 60	7870 70	9250 80
¹⁰⁵ Ru	-85930 4	898995 4	1917 4		-4843 7	5910.07 19	10730 50
¹⁰⁵ Rh	-87847 5	900130 5	567 3		-3936 24	8968 5	7045 4
¹⁰⁵ Pd	-88414 5	899914 5			-2889 5	7094.1 7	8753 5
¹⁰⁵ Ag	-87068 11	897787 11		1345 11	-2085 20	10027 12	4966 11
¹⁰⁵ Cd	-84330 11	894266 11		2738 4	-1327 21	8426 14	6507 12
¹⁰⁵ In	-79481 17	888635 17		4849 13	-680 110	11490 140	2794 19
¹⁰⁵ Sn	-73220 90	881600 90		6260 90	100 180	9740 180	4450 170
¹⁰⁵ Sb	-63780 150	871370 150		9440 180	(2200)	(12500)	-483 15
¹⁰⁶ Y	(-46400)	(871400)	(13300)		(-10800)	(3300)	
¹⁰⁶ Zr	(-59700)	(884000)	(7200)		(-9000)	(5400)	(15800)
¹⁰⁶ Nb	(-66900)	(890400)	(9400)		(-7400)	(4100)	(11800)
¹⁰⁶ Mo	-76257 22	898959 22	3520 17		-6940 60	6990 70	12690 100
¹⁰⁶ Tc	-79777 14	901696 14	6547 11		-5850 40	5560 60	9730 70
¹⁰⁶ Ru	-86324 8	907461 8	39.40 21		-5192 22	8466 8	11320 60
¹⁰⁶ Rh	-86364 8	906718 8	3541 6		-4221 12	6588 7	7723 8
¹⁰⁶ Pd	-89905 5	909477 5			-3232 5	9562.6 4	9347 3
¹⁰⁶ Ag	-86940 5	905729 5	194 8	2965 3	-2589 7	7943 11	5815 3
¹⁰⁶ Cd	-87134 6	905141 6			-1633 7	10875 12	7354 12
¹⁰⁶ In	-80610 14	897835 14		6523 12	-1060 70	9201 22	3569 17
¹⁰⁶ Sn	-77430 50	893870 50		3190 50	-470 90	12270 100	5230 50
¹⁰⁶ Sb	(-66400)	(882000)		(11100)	(1400)	(10600)	(400)
¹⁰⁶ Te	(-58000)	(872900)		(8300)	4293 9		(1500)
¹⁰⁷ Zr	(-55100)	(887400)	(9800)		(-10000)	(3500)	(16000)
¹⁰⁷ Nb	(-64900)	(896500)	(8000)		(-8600)	(6100)	(12500)
¹⁰⁷ Mo	-72940 160	903710 160	6160 60		-6990 190	4750 160	(13300)
¹⁰⁷ Tc	-79100 150	909090 150	4820 90		-6210 160	7390 150	10130 150
¹⁰⁷ Ru	-83920 120	913130 120	2940 120		-5500 140	5670 120	11430 120
¹⁰⁷ Rh	-86861 12	915287 12	1511 13		-4687 16	8569 14	7826 14
¹⁰⁷ Pd	-88372 6	916016 6	33 3		-3538 7	6539 7	9297 9
¹⁰⁷ Ag	-88405 6	915266 6			-2808 6	9537 7	5789 6
¹⁰⁷ Cd	-86988 7	913067 7		1417 4	-1934 7	7926 9	7338 8
¹⁰⁷ In	-83562 13	908859 13		3426 11	-1196 21	11023 19	3717 14
¹⁰⁷ Sn	-78560 90	903070 90		5010 90	-330 90	9200 90	5230 90
¹⁰⁷ Sb	(-70700)	(894400)		(7900)	(1500)	(12400)	(500)
¹⁰⁷ Te	(-60500)	(883500)		(10100)	4008 5	(10600)	(1400)
¹⁰⁸ Zr	(-51900)	(892300)	(8600)		(-9900)	(4900)	
¹⁰⁸ Nb	(-60500)	(900200)	(10600)		(-8400)	(3700)	(12700)
¹⁰⁸ Mo	(-71190)	(910030)	(4750)		(-7300)	(6300)	(13600)
¹⁰⁸ Tc	-75940 130	914000 130	7720 50		-6130 170	4910 200	10280 210
¹⁰⁸ Ru	-83660 120	920930 120	1360 60		-5750 140	7810 170	11840 190
¹⁰⁸ Rh	-85020 110	921510 110	4510 110		-4950 110	6230 110	8380 160
¹⁰⁸ Pd	-89522 4	925236 4			-3855 5	9221 7	9949 12
¹⁰⁸ Ag	-87604 6	922536 6	1649 8	1918 6	-3078 6	7269.6 6	6520 3
¹⁰⁸ Cd	-89253 6	923403 6			-2287 7	10336 9	8136 8
¹⁰⁸ In	-84100 40	917460 40		5160 40	-1410 40	8600 40	4400 40
¹⁰⁸ Sn	-82000 40	914590 40		2092 25	-450 40	11520 80	5730 50
¹⁰⁸ Sb	(-72510)	(904310)		(9500)	(1140)	(9900)	(1240)
¹⁰⁸ Te	-65680 150	896700 150		(6800)	3445 4	(13200)	(2300)
¹⁰⁸ I	(-52800)	(883100)		(12900)	4100 50		(-400)
¹⁰⁹ Nb	(-58100)	(905800)	(9100)		(-9400)	(5600)	(13500)
¹⁰⁹ Mo	(-67200)	(914200)	(7600)		(-7300)	(4100)	(14000)
¹⁰⁹ Tc	(-74870)	(921000)	(5990)		(-6440)	(7000)	(11000)
¹⁰⁹ Ru	-80850 70	926200 70	4160 70		-5940 100	5270 140	12210 150
¹⁰⁹ Rh	-85012 12	929581 12	2591 12		-5150 60	8070 110	8650 120
¹⁰⁹ Pd	-87604 4	931390 4	1115.9 20		-4099 5	6153.3 3	9880 110

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁰⁹ Ag	-88720 3	931723 3			-3298 5	9187 6	6486.9 20
¹⁰⁹ Cd	-88505 4	930727 4		214 3	-2517 6	7324 6	8191 7
¹⁰⁹ In	-86485 6	927924 6		2020 6	-1842 12	10460 40	4522 5
¹⁰⁹ Sn	-82636 10	923292 10		3850 11	-730 15	8700 40	5830 40
¹⁰⁹ Sb	-76256 19	916130 19		6380 16	800 30	(11820)	1540 50
¹⁰⁹ Te	-67570 70	906670 70		8680 80	3230 50	9960 170	(2360)
¹⁰⁹ I	-57570 150	895880 150		10000 170	3782 16	(12800)	-819.5 19
¹¹⁰ Nb	(-53400)	(909200)	(12100)		(-9400)	(3400)	
¹¹⁰ Mo	(-65500)	(920400)	(5900)		(-8200)	(6300)	(14600)
¹¹⁰ Tc	(-71400)	(925600)	(8800)		(-6900)	(4600)	(11400)
¹¹⁰ Ru	-80140 230	933560 230	2810 50		-6310 230	7360 240	(12600)
¹¹⁰ Rh	-82950 220	935590 220	5400 220		-5600 220	6010 220	9390 230
¹¹⁰ Pd	-88350 11	940207 11			-4450 13	8818 11	10627 5
¹¹⁰ Ag	-87458 3	938532 3	2892.2 16	892 11	-3519 8	6809.20 10	7142.8 20
¹¹⁰ Cd	-90350 3	940642 3			-2870 6	9916 3	8919.0 16
¹¹⁰ In	-86472 12	935982 12		3878 12	-1957 13	8058 13	5255 12
¹¹⁰ Sn	-85835 16	934563 16		637 19	-1126 17	11270 17	6638 16
¹¹⁰ Sb	(-77540)	(925480)		(8300)	(650)	(9350)	(2190)
¹¹⁰ Te	-72280 50	919440 50		(5260)	2723 16	12770 90	3310 60
¹¹⁰ I	(-60300)	(906700)		(11900)	3580 50	(10800)	(100)
¹¹⁰ Xe	(-51700)	(897300)		(8600)	3885 14		(1400)
¹¹¹ Mo	(-61000)	(924100)	(8800)		(-8300)	(3600)	(14900)
¹¹¹ Tc	(-69800)	(932100)	(7000)		(-7300)	(6500)	(11600)
¹¹¹ Ru	(-76800)	(938300)	(5500)		(-6300)	(4700)	(12700)
¹¹¹ Rh	(-82290)	(943000)	(3740)		(-5610)	(7400)	(9400)
¹¹¹ Pd	-86030 40	945960 40	2190 40		-4530 130	5750 40	10370 230
¹¹¹ Ag	-88217 3	947364 3	1036.8 14		-3781 12	8831.2 22	7156 11
¹¹¹ Cd	-89254 3	947618 3			-3307 7	6975.84 19	9085.7 16
¹¹¹ In	-88389 5	945970 5		865 5	-2408 7	9988 12	5328 5
¹¹¹ Sn	-85944 7	942743 7		2445 8	-1381 10	8181 16	6761 14
¹¹¹ Sb	(-80840)	(936860)		(5100)	(290)	(11400)	(2300)
¹¹¹ Te	-73480 70	928710 70		(7370)	2660 110	9270 90	(3230)
¹¹¹ I	(-64900)	(919400)		(8500)	3280 50	(12700)	(-0)
¹¹¹ Xe	(-54400)	(908000)		(10600)	3720 50	(10700)	(1300)
¹¹² Mo	(-58800)	(930000)	(7100)		(-9400)	(5900)	
¹¹² Tc	(-65900)	(936300)	(10000)		(-7800)	(4200)	(12200)
¹¹² Ru	(-75900)	(945400)	(3670)		(-7100)	(7100)	(13300)
¹¹² Rh	(-79500)	(948300)	(6800)		(-6000)	(5300)	(10000)
¹¹² Pd	-86337 18	954337 18	288 17		-5110 120	8380 40	(11340)
¹¹² Ag	-86625 17	953843 17	3956 17		-4030 110	6479 17	7880 40
¹¹² Cd	-90581 3	957016 3			-3484 3	9398.1 22	9653 3
¹¹² In	-87995 5	953648 5	664 5	2586 5	-2816 8	7678 6	6030 5
¹¹² Sn	-88659 4	953529 4			-1831 7	10786 6	7559 5
¹¹² Sb	-81604 23	945692 23		7055 23	70 40	(8830)	2949 24
¹¹² Te	-77260 170	940560 170		4350 170	2320 160	11850 180	(3700)
¹¹² I	(-67100)	(929620)		(10200)	2990 50	(10200)	(910)
¹¹² Xe	-59930 150	921670 150		(7200)	3330 6	(13600)	(2300)
¹¹² Cs	(-46300)	(907200)		(13700)	(4130)		-814 7
¹¹³ Mo	(-54000)	(933200)	(10000)			(3200)	
¹¹³ Tc	(-64000)	(942400)	(8200)		(-8300)	(6100)	(12400)
¹¹³ Ru	(-72200)	(949800)	(6600)		(-7300)	(4400)	(13500)
¹¹³ Rh	(-78800)	(955600)	(4900)		(-6300)	(7300)	(10200)
¹¹³ Pd	-83690 40	959760 40	3340 40		-5270 80	5430 40	(11400)
¹¹³ Ag	-87033 17	962322 17	2016 17		-4446 20	8480 24	7985 24
¹¹³ Cd	-89050 3	963556 3	316 3		-3871 3	6540.2 6	9714 17
¹¹³ In	-89366 3	963091 3			-3072 4	9443 5	6074 3
¹¹³ Sn	-88330 4	961272 4		1036 3	-2250 5	7742.9 18	7624 5
¹¹³ Sb	-84414 22	956573 22		3917 22	-353 23	10880 30	3044 22
¹¹³ Te	(-78310)	(949690)		(6100)	(1900)	(9100)	(4000)
¹¹³ I	-71120 50	941720 50		(7190)	2710 50	(12100)	1160 180
¹¹³ Xe	-62050 90	931870 90		9070 100	3100 50	10200 180	(2250)
¹¹³ Cs	-51660 150	920690 150		10390 180	3484 7	(13500)	-974 3
¹¹⁴ Tc	(-59700)	(946200)	(11100)		(-8800)	(3800)	(13000)
¹¹⁴ Ru	(-70800)	(956500)	(4800)		(-7800)	(6700)	(14100)
¹¹⁴ Rh	(-75600)	(960500)	(7900)		(-6700)	(4900)	(10700)
¹¹⁴ Pd	-83494 25	967637 25	1451 25		-5780 230	7870 50	(12000)
¹¹⁴ Ag	-84940 30	968310 30	5080 30		-4420 230	5980 30	8540 50
¹¹⁴ Cd	-90021 3	972599 3			-4096 11	9042.7 3	10277 17
¹¹⁴ In	-88569 3	970365 3	1988.7 7	1452 3	-3537 4	7274.4 12	6809 3
¹¹⁴ Sn	-90558 3	971571 3			-2633 4	10299 3	8480.7 13

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹¹⁴ Sb	-84680 200	964910 200		5880 200	-630 200	8330 200	3640 200
¹¹⁴ Te	(-81920)	(961370)		(2800)	(1490)	(11700)	(4790)
¹¹⁴ I	(-72800)	(951500)		(9100)	(2300)	(9700)	(1800)
¹¹⁴ Xe	(-66930)	(944820)		(5900)	(2920)	(12950)	(3100)
¹¹⁴ Cs	(-54600)	(931700)		(12400)	3360 50	(11000)	(-200)
¹¹⁴ Ba	(-45700)	(922000)		(8900)	(3600)		(1300)
¹¹⁵ Tc	(-57500)	(952100)	(9300)			(5800)	
¹¹⁵ Ru	(-66800)	(960600)	(7600)		(-8200)	(4100)	(14300)
¹¹⁵ Rh	-74400 500	967400 500	6000 500		(-7000)	(6900)	(10900)
¹¹⁵ Pd	-80400 60	972620 60	4580 50		(-6000)	4980 70	(12100)
¹¹⁵ Ag	-84990 30	976420 30	3100 30		(-5120)	8110 40	8780 40
¹¹⁵ Cd	-88091 3	978740 3	1446 4		-4490 40	6140.9 6	10430 30
¹¹⁵ In	-89537 4	979404 4	496 4		-3744 5	9039 4	6804 4
¹¹⁵ Sn	-90033 3	979117 3			-3203 4	7545.8 16	8752.2 18
¹¹⁵ Sb	-87003 20	975305 20		3030 20	-1039 21	10400 200	3733 20
¹¹⁵ Te	-82360 110	969880 110		4640 100	1160 110	(8520)	4980 230
¹¹⁵ I	(-76500)	(963200)		(5900)	(2000)	(11700)	(1800)
¹¹⁵ Xe	(-68430)	(954390)		(8000)	(2620)	(9600)	(2900)
¹¹⁵ Cs	(-59700)	(944800)		(8800)	(2900)	(13200)	(0)
¹¹⁵ Ba	(-48700)	(933100)		(11000)	(3200)	(11100)	(1400)
¹¹⁶ Ru	(-65100)	(966900)	(6000)		(-8600)	(6300)	(14900)
¹¹⁶ Rh	(-71100)	(972100)	(8900)		(-7600)	(4700)	(11600)
¹¹⁶ Pd	-79960 60	980250 60	2610 30		(-6500)	7630 80	12800 500
¹¹⁶ Ag	-82570 50	982070 50	6150 50		(-5500)	5650 60	9450 80
¹¹⁶ Cd	-88720 3	987440 3			-4808 18	8700.2 20	11020 30
¹¹⁶ In	-88250 4	986188 4	3275 4	470 4	-4050 17	6784.3 8	7448 4
¹¹⁶ Sn	-91525 3	988681 3			-3369 3	9563.41 11	9277 4
¹¹⁶ Sb	-86818 6	983191 6		4707 5	-1248 7	7886 21	4074 5
¹¹⁶ Te	-85310 90	980900 90		1510 90	930 90	11010 140	5590 90
¹¹⁶ I	-77560 140	972370 140		7750 110	1620 140	(9200)	2490 180
¹¹⁶ Xe	(-72900)	(966930)		(4660)	(1900)	(12500)	(3700)
¹¹⁶ Cs	-62500 400	955700 400		(10400)	(2200)	(10900)	(1300)
¹¹⁶ Ba	(-54300)	(946800)		(8200)	(3200)	(13700)	(1900)
¹¹⁷ Ru	(-60700)	(970700)	(8800)		(-9200)	(3800)	
¹¹⁷ Rh	(-69500)	(978700)	(7000)		(-8000)	(6500)	(11800)
¹¹⁷ Pd	(-76500)	(984900)	(5700)		(-6800)	(4600)	(12800)
¹¹⁷ Ag	-82270 50	989840 50	4160 50		(-5900)	7770 70	9590 70
¹¹⁷ Cd	-86426 3	993217 3	2517 6		-5160 40	5777.2 10	11150 50
¹¹⁷ In	-88943 6	994952 6	1455 5		-4334 18	8765 6	7512 6
¹¹⁷ Sn	-90398 3	995625 3			-3773 3	6944.6 11	9437 4
¹¹⁷ Sb	-88641 9	993086 9		1757 9	-1700 9	9895 10	4406 9
¹¹⁷ Te	-85107 19	988769 19		3535 17	799 19	7870 90	5578 19
¹¹⁷ I	-80440 70	983320 70		4670 70	1550 70	10950 160	2420 110
¹¹⁷ Xe	-73990 180	976090 180		6440 180	(1900)	(9200)	3720 200
¹¹⁷ Cs	-66470 50	967790 50		7520 190	2230 80	12100 400	(860)
¹¹⁷ Ba	(-57000)	(957500)		(9500)	(2700)	(10700)	(1800)
¹¹⁷ La	(-46600)	(946300)		(10400)	(2700)		(-500)
¹¹⁸ Ru	(-58700)	(976600)	(7100)			(6000)	
¹¹⁸ Rh	(-65700)	(982900)	(9700)		(-8400)	(4300)	(12300)
¹¹⁸ Pd	-75470 210	991890 210	4100 200		(-7100)	(7000)	(13200)
¹¹⁸ Ag	-79570 60	995210 60	7140 60		(-6400)	5370 80	(10300)
¹¹⁸ Cd	-86709 20	1001572 20	521 22		-5640 30	8355 20	11730 50
¹¹⁸ In	-87230 8	1001311 8	4423 8		-4710 30	6358 6	8093 9
¹¹⁸ Sn	-91653 3	1004952 3			-4057 3	9326.5 14	9999 5
¹¹⁸ Sb	-87996 4	1000513 4		3657 3	-1852 4	7426 10	4887 3
¹¹⁸ Te	-87723 16	999457 16		273 16	410 16	10688 25	6371 18
¹¹⁸ I	-80690 80	991640 80		7030 80	1560 220	8330 110	2870 80
¹¹⁸ Xe	-77700 1000	987900 1000		3000 1000	(1800)	11800 1000	4600 1000
¹¹⁸ Cs	-68414 13	977800 13		9300 1000	(2000)	10010 60	1710 180
¹¹⁸ Ba	(-62000)	(970600)		(6400)	(2500)	(13100)	(2800)
¹¹⁸ La	(-49800)	(957600)		(12200)	(2400)	(11300)	(100)
¹¹⁹ Rh	(-63900)	(989200)	(8100)		(-8900)	(6300)	(12600)
¹¹⁹ Pd	(-72000)	(996500)	(6500)		(-7700)	(4600)	(13600)
¹¹⁹ Ag	-78560 90	1002270 90	5350 40		-6600 500	7060 110	10380 230
¹¹⁹ Cd	-83910 80	1006840 80	3800 80		-5930 100	5270 80	11630 100
¹¹⁹ In	-87704 8	1009856 8	2364 8		-5140 40	8545 9	8284 22
¹¹⁹ Sn	-90067 3	1011437 3			-4401 3	6485.4 14	10126 8
¹¹⁹ Sb	-89473 8	1010061 8		594 8	-2361 9	9548 8	5109 8
¹¹⁹ Te	-87180 8	1006985 8		2293.0 20	427 8	7528 18	6473 8
¹¹⁹ I	-83670 60	1002690 60		3510 60	910 70	11050 90	3230 70

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹¹⁹ Xe	-78660 120	996900 120		5010 110	1280 160	9000 1000	5260 140
¹¹⁹ Cs	-72311 14	989769 14		6350 120	(1700)	11969 19	1900 1000
¹¹⁹ Ba	-64200 1000	980900 1000		8100 1000	(1800)	(10300)	3100 1000
¹¹⁹ La	(-55000)	(970900)		(9300)	(2300)	(13300)	(300)
¹¹⁹ Ce	(-44000)	(959100)		(11000)	(2300)		(1500)
¹²⁰ Rh	(-59800)	(993200)	(10900)			(4000)	
¹²⁰ Pd	(-70800)	(1003300)	(4900)		(-8100)	(6800)	(14100)
¹²⁰ Ag	-75650 70	1007440 70	8330 70		(-7000)	5160 120	(10900)
¹²⁰ Cd	-83973 19	1014979 19	1760 40		-6440 60	8140 80	12710 90
¹²⁰ In	-85730 40	1015960 40	5370 40		-5590 60	6100 40	9120 90
¹²⁰ Sn	-91103 3	1020544 3			-4808 4	9107.4 22	10689 7
¹²⁰ Sb	-88423 8	1017081 8	982 13	2681 7	-2598 8	7021 11	5644 7
¹²⁰ Te	-89405 10	1017281 10			-305 11	10296 13	7221 13
¹²⁰ I	-83790 18	1010884 18		5615 15	603 19	8200 70	3899 20
¹²⁰ Xe	-81830 40	1008140 40		1960 40	1050 100	11240 130	5450 80
¹²⁰ Cs	-73888 10	999417 10		7940 50	1250 140	9648 17	2520 120
¹²⁰ Ba	-68900 300	993600 300		5000 300	(1600)	12700 1100	3900 300
¹²⁰ La	(-57700)	(981700)		(11200)	(2400)	(10800)	(800)
¹²⁰ Ce	(-49700)	(972900)		(8000)	(2200)	(13800)	(2000)
¹²¹ Rh	(-57700)	(999100)	(9200)			(5900)	
¹²¹ Pd	(-66900)	(1007500)	(7800)		(-8600)	(4200)	(14400)
¹²¹ Ag	-74660 150	1014520 150	6400 120		(-7500)	7080 160	(11200)
¹²¹ Cd	-81060 80	1020140 80	4780 80		(-7000)	5160 90	12700 110
¹²¹ In	-85840 30	1024130 30	3360 30		-6000 60	8180 50	9150 30
¹²¹ Sn	-89202.8 25	1026715.2 25	390.1 21		-5202 4	6170.8 6	10760 40
¹²¹ Sb	-89592.9 23	1026322.9 23			-3075 6	9242 7	5778.6 21
¹²¹ Te	-88557 25	1024505 25		1036 25	-584 25	7220 30	7420 30
¹²¹ I	-86288 11	1021453 11		2270 30	-72 15	10569 16	4172 4
¹²¹ Xe	-82543 24	1016926 24		3750 30	140 30	8780 50	6040 30
¹²¹ Cs	-77143 14	1010744 14		5400 20	870 70	11327 16	2600 50
¹²¹ Ba	-70300 300	1003200 300		6800 300	1200 400	9500 400	3700 300
¹²¹ La	(-62400)	(994400)		(7900)	(1600)	(12800)	(800)
¹²¹ Ce	(-52500)	(983700)		(9900)	(2100)	(10800)	(2100)
¹²¹ Pr	(-41600)	(972100)		(10900)	(2600)		-840 50
¹²² Pd	(-65400)	(1014100)	(6000)		(-9200)	(6600)	(15000)
¹²² Ag	(-71430)	(1019360)	(9100)		(-8100)	(4840)	(11800)
¹²² Cd	(-80570)	(1027720)	(3000)		(-7500)	(7590)	(13210)
¹²² In	-83580 50	1029940 50	6370 50		-6440 80	5810 60	9810 100
¹²² Sn	-89945 3	1035529 3			-5661 20	8813.5 25	11400 30
¹²² Sb	-88328.5 22	1033129.9 22	1982.5 20	1616 3	-3523 8	6806.9 10	6414.7 22
¹²² Te	-90311.1 18	1034330.1 19			-1083 3	9825 25	8007.1 21
¹²² I	-86077 5	1029314 5		4234 5	-506 7	7860 12	4810 30
¹²² Xe	-85190 90	1027640 90		890 90	110 90	10720 90	6190 90
¹²² Cs	-78132 16	1019804 16		7050 90	130 80	9060 20	2880 30
¹²² Ba	(-74300)	(1015200)		(3900)	(1000)	(12000)	(4400)
¹²² La	(-64500)	(1004700)		(9700)	(1400)	(10200)	(1500)
¹²² Ce	(-57700)	(997100)		(6800)	(1800)	(13300)	(2600)
¹²² Pr	(-45000)	(983600)		(12700)	(2300)	(11500)	(-100)
¹²³ Pd	(-61200)	(1018000)	(8700)			(3900)	
¹²³ Ag	(-70000)	(1026000)	(7400)		(-8400)	(6600)	(11900)
¹²³ Cd	-77310 40	1032530 40	6120 30		(-7700)	(4810)	(13170)
¹²³ In	-83426 24	1037863 24	4394 24		-7290 90	7920 60	(10140)
¹²³ Sn	-87819 3	1041475 3	1403 3		-6340 80	5945.9 12	11530 50
¹²³ Sb	-89222.5 20	1042095.2 20			-3944 8	8965.3 22	6567 3
¹²³ Te	-89169.2 18	1041259.5 18		53.3 18	-1527 3	6929.4 5	8129.6 20
¹²³ I	-87935 4	1039243 4		1234 3	-887 9	9929 6	4913 3
¹²³ Xe	-85259 15	1035785 15		2676 15	-504 17	8140 90	6471 16
¹²³ Cs	-81049 12	1030792 12		4210 20	190 60	10989 20	3150 90
¹²³ Ba	(-75600)	(1024600)		(5500)	(600)	(9400)	(4700)
¹²³ La	(-68700)	(1016900)		(6900)	(1200)	(12200)	(1700)
¹²³ Ce	(-60100)	(1007500)		(8600)	(1700)	(10400)	(2800)
¹²³ Pr	(-50300)	(997000)		(9700)	(2200)	(13400)	(-100)
¹²⁴ Ag	(-66600)	(1030600)	(10100)		(-9200)	(4700)	(12600)
¹²⁴ Cd	-76710 60	1040000 60	4170 40		(-8400)	7470 70	(14000)
¹²⁴ In	-80880 50	1043380 50	7360 50		-7650 90	5520 50	10850 60
¹²⁴ Sn	-88236.1 14	1049962.5 14			-6688 19	8488 3	12100 24
¹²⁴ Sb	-87618.6 20	1048562.6 20	2904.5 15	617.5 21	-4310 40	6467.45 7	7088 3
¹²⁴ Te	-90523.1 15	1050684.8 15			-1844.7 25	9425.2 11	8589.5 15
¹²⁴ I	-87363.5 24	1046742.8 24	294 3	3159.6 19	-1366 8	7500 4	5483.3 22
¹²⁴ Xe	-87657.5 20	1046254.4 20			-678 10	10470 16	7012 4

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹²⁴ Cs	-81743 12	1039557 12		5915 12	-378 22	8765 16	3773 19
¹²⁴ Ba	-79095 14	1036127 14		2648 18	310 50	(11600)	5334 18
¹²⁴ La	(-70300)	(1026600)		(8800)	(1200)	(9700)	(2000)
¹²⁴ Ce	(-64700)	(1020200)		(5600)	(1700)	(12700)	(3300)
¹²⁴ Pr	(-53100)	(1007800)		(11600)	(2100)	(10900)	(300)
¹²⁵ Ag	(-64700)	(1036800)	(8700)		(-9400)	(6200)	
¹²⁵ Cd	-73360 70	1044720 70	7120 60		(-8900)	4720 90	(14100)
¹²⁵ In	-80480 30	1051060 30	5420 30		-8250 150	7680 60	11060 70
¹²⁵ Sn	-85897.8 15	1055695.5 15	2363 3		-7260 80	5733.0 5	12310 50
¹²⁵ Sb	-88261 3	1057276 3	766.7 21		-4850 30	8714 3	7314 3
¹²⁵ Te	-89027.8 19	1057260.8 19			-2250 3	6576.0 14	8698.1 20
¹²⁵ I	-88842.0 19	1056292.6 19		185.77 6	-1674.0 25	9549.9 23	5607.9 14
¹²⁵ Xe	-87189.5 20	1053857.8 20		1653 3	-1057 25	7603.3 4	7115 3
¹²⁵ Cs	-84091 8	1049977 8		3099 8	-228 14	10419 14	3722 8
¹²⁵ Ba	-79530 250	1044630 250		4560 250	590 250	8510 250	5080 250
¹²⁵ La	(-73900)	(1038200)		(5600)	(800)	(11700)	(2100)
¹²⁵ Ce	(-66600)	(1030100)		(7300)	(1400)	(9900)	(3600)
¹²⁵ Pr	(-57900)	(1020700)		(8700)	(2100)	(12900)	(500)
¹²⁶ Ag	(-61000)	(1041200)	(11300)			(4400)	
¹²⁶ Cd	-72330 50	1051760 50	5490 40		(-9400)	7040 90	(14900)
¹²⁶ In	-77810 40	1056460 40	8210 40		(-8810)	5400 50	11740 80
¹²⁶ Sn	-86020 11	1063889 11	380 30		(-7870)	8193 11	12830 30
¹²⁶ Sb	-86400 30	1063480 30	3670 30		-5250 60	6210 30	7790 30
¹²⁶ Te	-90070.3 19	1066374.6 19			-2550 3	9113.8 4	9098.2 22
¹²⁶ I	-87915 4	1063437 4	1258 5	2155 4	-2011 4	7144 4	6176 4
¹²⁶ Xe	-89173 6	1063913 6			-1287 6	10055 7	7620 6
¹²⁶ Cs	-84349 12	1058306 12		4824 14	-697 13	8329 14	4448 12
¹²⁶ Ba	-82676 14	1055850 14		1673 18	90 90	11220 250	5874 16
¹²⁶ La	(-75100)	(1047500)		(7600)	(600)	(9300)	(2900)
¹²⁶ Ce	(-70700)	(1042300)		(4400)	(1200)	(12200)	(4100)
¹²⁶ Pr	(-60300)	(1031100)		(10400)	(1900)	(10400)	(1000)
¹²⁶ Nd	(-53000)	(1023100)		(7200)	(2300)		(2400)
¹²⁷ Ag	(-58800)	(1047100)	(9700)			(5900)	
¹²⁷ Cd	-68530 70	1056030 70	8470 60		(-9700)	4270 90	(14800)
¹²⁷ In	-76990 40	1063720 40	6510 30		(-9500)	7250 60	11960 70
¹²⁷ Sn	-83508 25	1069448 25	3201 24		-8620 50	5560 30	12980 50
¹²⁷ Sb	-86709 6	1071867 6	1581 5		-5708 25	8380 30	7978 12
¹²⁷ Te	-88290 3	1072665 3	698 4		-2895 4	6291 3	9180 30
¹²⁷ I	-88987 4	1072580 4			-2190 4	9143 3	6206 4
¹²⁷ Xe	-88325 4	1071136 4		662.4 21	-1580 4	7223 6	7699 3
¹²⁷ Cs	-86240 9	1068269 9		2085 9	-730 9	9963 15	4356 10
¹²⁷ Ba	-82790 100	1064040 100		3450 100	40 100	8190 100	5730 100
¹²⁷ La	(-78100)	(1058560)		(4690)	(530)	(11100)	(2710)
¹²⁷ Ce	(-72000)	(1051600)		(6100)	(1200)	(9300)	(4100)
¹²⁷ Pr	(-64400)	(1043300)		(7500)	(1900)	(12200)	(1000)
¹²⁷ Nd	(-55400)	(1033500)		(9000)	(2200)	(10500)	(2500)
¹²⁸ Cd	-67300 300	1062900 300	7100 300			6800 300	(15800)
¹²⁸ In	-74360 50	1069150 50	8980 40		(-10200)	5440 60	13120 90
¹²⁸ Sn	-83340 30	1077350 30	1274 15		-9050 70	7900 40	13630 50
¹²⁸ Sb	-84610 25	1077839 25	4384 25		-6160 60	5970 30	8390 40
¹²⁸ Te	-88993.6 18	1081440.6 18			-3182.4 22	8775 4	9574 6
¹²⁸ I	-87742 4	1079406 4	2119 4	1252 4	-2548 4	6826.07 5	6741 4
¹²⁸ Xe	-89860.8 14	1080743.0 14			-1762.7 19	9607 4	8163 4
¹²⁸ Cs	-85932 6	1076032 6		3929 5	-994 6	7764 10	4897 7
¹²⁸ Ba	-85410 11	1074727 11		523 12	-177 11	10690 100	6459 14
¹²⁸ La	-78800 400	1067300 400		6700 400	600 400	(8700)	3300 400
¹²⁸ Ce	(-75600)	(1063300)		(3200)	(1100)	(11700)	(4800)
¹²⁸ Pr	(-66300)	(1053300)		(9300)	(1600)	(10000)	(1700)
¹²⁸ Nd	(-60200)	(1046400)		(6100)	(2100)	(12800)	(3000)
¹²⁸ Pm	(-48200)	(1033600)		(12000)	(2500)		(100)
¹²⁹ Cd	(-63100)	(1066700)	(9900)			(3900)	
¹²⁹ In	-72980 130	1075840 130	7660 30		(-10700)	6690 140	13000 300
¹²⁹ Sn	-80630 120	1082710 120	4000 120		-9700 140	5370 120	13560 130
¹²⁹ Sb	-84626 21	1085927 21	2380 21		-6570 40	8090 30	8580 30
¹²⁹ Te	-87006 3	1087524 3	1498 3		-3533 3	6083 3	9685 25
¹²⁹ I	-88504 3	1088240 3	194 3		-2667 4	8833 5	6799 3
¹²⁹ Xe	-88697.4 8	1087650.9 8			-2094.5 20	6907.9 16	8244 4
¹²⁹ Cs	-87501 5	1085673 5		1196 5	-1084 5	9640 7	4930 5
¹²⁹ Ba	-85070 11	1082459 11		2432 11	-305 12	7731 16	6427 13
¹²⁹ La	-81350 50	1077960 50		3720 50	320 50	10700 400	3230 50

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹²⁹ Ce	(-76300)	(1072120)		(5050)	(800)	(8800)	(4800)
¹²⁹ Pr	(-70000)	(1065000)		(6300)	(1500)	(11700)	(1700)
¹²⁹ Nd	(-62200)	(1056400)		(7800)	(2000)	(10100)	(3100)
¹²⁹ Pm	(-52900)	(1046400)		(9200)	(2500)	(12800)	(100)
¹³⁰ Cd	(-61500)	(1073200)	(8500)			(6500)	
¹³⁰ In	-70000 50	1080930 50	10250 40		(-11400)	5090 130	(14200)
¹³⁰ Sn	-80250 30	1090400 30	2148 15		-10340 60	7690 130	14560 130
¹³⁰ Sb	-82394 25	1091766 25	4959 25		-7010 50	5840 30	9050 120
¹³⁰ Te	-87352.9 19	1095942.5 20			-3758 11	8419 3	10016 21
¹³⁰ I	-86933 3	1094740 3	2949 3	420 4	-2960 30	6500.33 4	7216 3
¹³⁰ Xe	-89881.8 9	1096906.6 9			-2236.4 21	9255.8 9	8667 3
¹³⁰ Cs	-86903 8	1093145 8	369 11	2979 8	-1413 9	7473 10	5494 8
¹³⁰ Ba	-87271 7	1092731 7			-523 9	10273 11	7059 8
¹³⁰ La	(-81670)	(1086350)		(5600)	(250)	(8400)	(3890)
¹³⁰ Ce	(-79500)	(1083400)		(2200)	(800)	(11200)	(5400)
¹³⁰ Pr	(-71400)	(1074500)		(8100)	(1300)	(9500)	(2400)
¹³⁰ Nd	(-66300)	(1068700)		(5000)	(1900)	(12200)	(3600)
¹³⁰ Pm	(-55500)	(1057000)		(10900)	(2400)	(10600)	(600)
¹³⁰ Sm	(-47900)	(1048600)		(7600)	(2800)		(2200)
¹³¹ In	-68220 80	1087220 80	9174 22		(-11800)	6290 90	(14000)
¹³¹ Sn	-77390 70	1095610 70	4632 20		-11290 100	5210 80	14680 90
¹³¹ Sb	-80200 70	1099460 70	3190 70		-7450 80	7700 70	9060 80
¹³¹ Te	-85211.3 20	1101872.3 20	2233.5 23		-4129 25	5929.7 5	10106 25
¹³¹ I	-87444.8 11	1103323.4 12	970.8 6		-3161 6	8584 4	7380.8 22
¹³¹ Xe	-88415.6 10	1103511.8 10			-2551 3	6605.1 13	8772 4
¹³¹ Cs	-88063 5	1102377 5		352 5	-1501 6	9232 10	5470 5
¹³¹ Ba	-86693 7	1100225 7		1370 7	-794 8	7493.5 3	7080 11
¹³¹ La	-83730 100	1096480 100		2960 100	80 100	(10130)	3750 100
¹³¹ Ce	-79700 400	1091700 400		4000 400	700 400	(8300)	(5300)
¹³¹ Pr	-74500 400	1085600 400		5250 150	(1200)	(11200)	(2300)
¹³¹ Nd	-67900 500	1078300 500		6560 150	(1600)	(9600)	(3800)
¹³¹ Pm	(-59800)	(1069400)		(8100)	(2200)	(12400)	(800)
¹³¹ Sm	(-50400)	(1059200)		(9400)	(2600)	(10600)	(2200)
¹³² In	-62490 70	1089560 70	14140 60			2340 100	
¹³² Sn	-76620 30	1102920 30	3103 12		-11800 300	7300 80	15690 80
¹³² Sb	-79724 23	1105238 23	5486 20		-7790 50	5770 70	9620 80
¹³² Te	-85210 11	1109942 11	493 4		-4300 30	8070 12	10480 70
¹³² I	-85703 11	1109652 11	3577 11		-3520 30	6329 11	7780 11
¹³² Xe	-89279.5 11	1112447.0 11			-2710.8 21	8935.3 8	9123.7 10
¹³² Cs	-87160 3	1109545 3	1279.5 22	2119 3	-1843 5	7168 6	6033 3
¹³² Ba	-88440 3	1110042 3			-1004 3	9818 7	7665 6
¹³² La	-83730 40	1104550 40		4710 40	-220 50	8070 110	4330 50
¹³² Ce	(-82450)	(1102490)		(1290)	(540)	(10800)	(6000)
¹³² Pr	(-75340)	(1094600)		(7100)	(1000)	(8900)	(2900)
¹³² Nd	(-71600)	(1090100)		(3700)	(1500)	(11800)	(4400)
¹³² Pm	(-61700)	(1079400)		(9900)	(2200)	(10000)	(1100)
¹³² Sm	(-55100)	(1072000)		(6600)	(2600)	(12800)	(2600)
¹³² Eu	(-42700)	(1058800)		(12400)	(3100)		(-400)
¹³³ In	(-57400)	(1092600)	(13500)			(3000)	
¹³³ Sn	-70970 80	1105340 80	7990 25		(-10300)	2420 80	15770 100
¹³³ Sb	-78960 80	1112540 80	4003 13		-8410 150	7300 80	9630 80
¹³³ Te	-82960 80	1115760 80	2920 70		-4750 140	5820 80	10530 80
¹³³ I	-85880 30	1117900 30	1770 30		-3680 30	8250 30	7960 30
¹³³ Xe	-87648 4	1118887 4	427.4 24		-3068 5	6440 4	9235 11
¹³³ Cs	-88076 3	1118532 3			-1997 4	8986.9 19	6085 3
¹³³ Ba	-87558 3	1117232 3		517.4 10	-1286 3	7189.9 4	7687.1 22
¹³³ La	-85330 200	1114220 200		2230 200	-250 200	9670 200	4180 200
¹³³ Ce	(-82390)	(1110500)		(2900)	(250)	(8000)	(5950)
¹³³ Pr	(-78060)	(1105390)		(4300)	(870)	(10800)	(2900)
¹³³ Nd	(-72500)	(1099000)		(5600)	(1400)	(8900)	(4400)
¹³³ Pm	(-65500)	(1091200)		(7000)	(2100)	(11800)	(1100)
¹³³ Sm	(-57100)	(1082100)		(8400)	(2700)	(10000)	(2700)
¹³³ Eu	(-47600)	(1071800)		(9500)	(2900)	(13000)	(-200)
¹³⁴ In	(-51500)	(1094800)	(15100)			(2200)	
¹³⁴ Sn	-66640 100	1109080 100	7370 90		(-7600)	3740 130	(16500)
¹³⁴ Sb	-74010 50	1115660 50	8390 40		-6430 70	3120 90	10330 100
¹³⁴ Te	-82400 30	1123270 30	1550 30		-4580 40	7510 80	10730 80
¹³⁴ I	-83949 15	1124042 15	4175 15		-3980 30	6140 30	8280 80
¹³⁴ Xe	-88124.4 8	1127434.6 9			-3196.4 21	8547 4	9540 30
¹³⁴ Cs	-86896 3	1125424 3	2058.7 4	1229 3	-2388 4	6891.540 10	6536.5 24

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹³⁴ Ba	-88955 3	1126700 3			-1498 3	9467.7 11	8167.9 4
¹³⁴ La	-85240 30	1122200 30		3710 30	-760 30	7980 200	4970 30
¹³⁴ Ce	-84740 200	1120920 200		500 200	100 200	(10400)	6700 300
¹³⁴ Pr	(-78600)	(1114000)		(6190)	(700)	(8600)	(3500)
¹³⁴ Nd	(-75800)	(1110400)		2770 150	(1300)	(11400)	(5000)
¹³⁴ Pm	(-66600)	(1100400)		9170 200	(2300)	(9200)	(1400)
¹³⁴ Sm	(-61500)	(1094500)		(5200)	(2500)	(12500)	(3300)
¹³⁴ Eu	(-50000)	(1082300)		(11500)	(3000)	(10500)	(200)
¹³⁵ Sn	(-60800)	(1111300)	(8900)			(2200)	(16500)
¹³⁵ Sb	-69710 110	1119430 110	8120 50		-3910 130	3770 120	10360 150
¹³⁵ Te	-77830 90	1126770 90	5960 90		-2860 120	3500 100	11110 110
¹³⁵ I	-83788 23	1131951 23	2648 24		-4190 70	7910 30	8680 40
¹³⁵ Xe	-86436 10	1133817 10	1151 10		-3649 10	6383 10	9775 18
¹³⁵ Cs	-87587 3	1134186 3	269.3 12		-2567 3	8762.0 10	6751 3
¹³⁵ Ba	-87856 3	1133673 3			-1865 3	6972.7 5	8249.0 6
¹³⁵ La	-86656 10	1131690 10		1200 10	-1018 11	9490 30	4990 10
¹³⁵ Ce	-84630 11	1128883 11		2026 5	-362 13	7960 200	6680 30
¹³⁵ Pr	-80910 150	1124380 150		3720 150	400 180	(10400)	3460 250
¹³⁵ Nd	(-76160)	(1118850)		(4750)	(1100)	(8400)	(4900)
¹³⁵ Pm	(-70200)	(1112100)		(5940)	(1800)	(11700)	(1700)
¹³⁵ Sm	(-63000)	(1104100)		(7200)	(2500)	(9600)	(3700)
¹³⁵ Eu	(-54300)	(1094600)		(8700)	(3100)	(12400)	(100)
¹³⁶ Sn	(-56500)	(1115100)	(8100)			(3800)	
¹³⁶ Sb	(-64600)	(1122400)	(9800)		(-4500)	(3000)	(11100)
¹³⁶ Te	-74420 50	1131440 50	5070 60		-230 60	4670 100	12010 110
¹³⁶ I	-79500 50	1135730 50	6930 50		-2200 60	3780 50	8960 100
¹³⁶ Xe	-86424 7	1141877 7			-3640 13	8060 12	9926 23
¹³⁶ Cs	-86344 4	1141015 4	2548.2 19	80 8	-3067 11	6828.9 22	7197 10
¹³⁶ Ba	-88892 3	1142781 3			-2038 3	9107.74 4	8594.7 12
¹³⁶ La	-86020 70	1139130 70	470 80	2870 70	-1290 70	7440 70	5460 70
¹³⁶ Ce	-86500 50	1138820 50			-480 50	9940 50	7130 50
¹³⁶ Pr	-81370 50	1132910 50		5126 18	-60 70	8530 160	4030 50
¹³⁶ Nd	-79160 60	1129920 60		2211 25	(860)	(11070)	5540 160
¹³⁶ Pm	-71310 210	1121280 210		7850 200	(1600)	(9200)	(2400)
¹³⁶ Sm	(-66800)	(1116000)		(4500)	(2400)	(11800)	(3900)
¹³⁶ Eu	(-56400)	(1104800)		(10400)	(2900)	(10100)	(600)
¹³⁶ Gd	(-49300)	(1096900)		(7100)	(3400)		(2300)
¹³⁷ Sn	(-50500)	(1117200)	(9800)			(2100)	
¹³⁷ Sb	(-60300)	(1126100)	(9300)		(-5200)	(3700)	(11000)
¹³⁷ Te	-69560 120	1134650 120	6940 120		-1020 150	3210 130	(12300)
¹³⁷ I	-76500 30	1140810 30	5880 30		30 80	5070 60	9370 60
¹³⁷ Xe	-82379 7	1145903 7	4173 7		-1840 80	4025.5 3	10170 50
¹³⁷ Cs	-86551 3	1149293 3	1175.63 17		-3100 30	8278.3 19	7416 7
¹³⁷ Ba	-87727 3	1149686 3			-2503.4 25	6905.74 3	8671.6 19
¹³⁷ La	-87130 50	1148300 50		600 50	-1480 50	9180 80	5520 50
¹³⁷ Ce	-85900 50	1146300 50		1222.1 16	-770 50	7480.7 4	7170 80
¹³⁷ Pr	-83200 50	1142820 50		2702 10	-300 210	9905 21	3996 10
¹³⁷ Nd	-79510 70	1138340 70		3690 50	(450)	8430 60	5430 60
¹³⁷ Pm	(-73860)	(1131900)		(5660)	(1780)	(10620)	(1990)
¹³⁷ Sm	-67960 110	1125220 110		(5900)	(2100)	(9200)	3940 230
¹³⁷ Eu	(-60400)	(1116800)		(7600)	(2700)	(12100)	(900)
¹³⁷ Gd	(-51600)	(1107300)		(8800)	(3100)	(10300)	(2500)
¹³⁸ Sb	(-55000)	(1128900)	(10900)		(-5900)	(2800)	(11800)
¹³⁸ Te	(-65930)	(1139090)	(6370)		(-1720)	(4440)	(13000)
¹³⁸ I	-72300 80	1144680 80	7820 70		-720 100	3870 80	10030 150
¹³⁸ Xe	-80120 40	1151710 40	2770 40		-140 50	5810 40	10910 50
¹³⁸ Cs	-82893 10	1153706 10	5374 9		-1369 18	4413 9	7804 12
¹³⁸ Ba	-88267 3	1158298 3			-2568 3	8611.72 4	9005.00 18
¹³⁸ La	-86529 4	1155778 4	1044 11	1738 4	-2058 4	7470 50	6092 4
¹³⁸ Ce	-87574 11	1156040 11			-1044 10	9740 50	7740 50
¹³⁸ Pr	-83137 15	1150821 15		4437 10	-320 30	8010 50	4520 50
¹³⁸ Nd	(-82040)	(1148940)		(1100)	(300)	(10600)	(6120)
¹³⁸ Pm	(-75000)	(1141200)		7000 250	(1100)	(9300)	(2800)
¹³⁸ Sm	(-71200)	(1136600)		(3800)	(2100)	(11300)	(4700)
¹³⁸ Eu	(-62000)	(1126500)		(9200)	(2200)	(9700)	(1300)
¹³⁸ Gd	(-55900)	(1119700)		(6100)	(3100)	(12400)	(2900)
¹³⁸ Tb	(-43900)	(1106900)		(12000)	(3700)		(-400)
¹³⁹ Sb	(-50600)	(1132600)	(10200)			(3600)	
¹³⁹ Te	(-60800)	(1142000)	(8000)		(-2400)	(2900)	(13100)
¹³⁹ I	-68840 30	1149290 30	6806 23		-1560 110	4620 90	(10200)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹³⁹ Xe	-75650.21	1155316.21	5057.21		-250.90	3600.40	10640.80
¹³⁹ Cs	-80707.4	1159591.4	4213.3		656.24	5885.10	7880.40
¹³⁹ Ba	-84919.3	1163021.3	2317.3		-909.10	4723.434	9315.9
¹³⁹ La	-87236.3	1164556.3			-2074.3	8778.3	6258.3
¹³⁹ Ce	-86958.8	1163496.8		278.7	-1527.7	7456.12	7718.7
¹³⁹ Pr	-84829.8	1160584.8		2129.3	-598.13	9764.16	4544.13
¹³⁹ Nd	-82040.50	1157010.50		2790.50	160.50	(8080)	6190.50
¹³⁹ Pm	-77540.60	1151730.60		4500.30	950.160	(10600)	(2790)
¹³⁹ Sm	-72375.15	1145783.15		5160.60	(1360)	(9200)	(4600)
¹³⁹ Eu	(-65360)	(1137980)		(7020)	(2400)	(11400)	(1400)
¹³⁹ Gd	(-57700)	(1129500)		(7700)	(2900)	(9800)	(3000)
¹³⁹ Tb	(-48400)	(1119500)		(9300)	(3500)	(12600)	(-200)
¹⁴⁰ Te	(-57100)	(1146400)	(7000)		(-3000)	(4400)	(13800)
¹⁴⁰ I	(-64080)	(1152600)	(8920)		(-1900)	(3310)	(10600)
¹⁴⁰ Xe	-73000.60	1160730.60	4060.60		-1000.80	5420.60	11440.70
¹⁴⁰ Cs	-77056.9	1164012.9	6220.10		20.50	4421.9	8695.22
¹⁴⁰ Ba	-83276.8	1169449.8	1050.8		724.11	6428.8	9858.9
¹⁴⁰ La	-84326.3	1169717.3	3761.919		-407.3	5160.975	6695.3
¹⁴⁰ Ce	-88088.3	1172696.3			-1620.3	9201.7	8140.519
¹⁴⁰ Pr	-84700.7	1168526.7		3388.6	-1100.70	7942.10	5030.9
¹⁴⁰ Nd	-84477.19	1167521.19		222.20	-410.50	10510.50	6937.21
¹⁴⁰ Pm	-78430.30	1160690.30		6047.23	510.60	8960.70	3680.60
¹⁴⁰ Sm	-75459.15	1156939.15		2970.30	1270.60	11156.21	5210.60
¹⁴⁰ Eu	-66990.50	1147690.50		8470.50	1890.210	(9710)	1900.50
¹⁴⁰ Gd	(-61500)	(1141400)		(5500)	(2800)	(11900)	(3500)
¹⁴⁰ Tb	(-50700)	(1129900)		(10800)	(3200)	(10400)	(300)
¹⁴⁰ Dy	(-43000)	(1121400)		(7700)	(3800)		(1900)
¹⁴¹ Te	(-51800)	(1149200)	(8900)		(-3700)	(2800)	
¹⁴¹ I	(-60700)	(1157300)	(7600)		(-2900)	(4700)	(10900)
¹⁴¹ Xe	-68330.90	1164140.90	6150.90		-1190.150	3400.110	(11540)
¹⁴¹ Cs	-74479.10	1169506.10	5251.11		-400.30	5494.13	8770.60
¹⁴¹ Ba	-79730.8	1173975.8	3213.9		224.11	4525.11	9963.11
¹⁴¹ La	-82943.5	1176405.5	2502.4		1183.5	6689.4	6956.9
¹⁴¹ Ce	-85445.3	1178125.3	580.711		-143.3	5428.67	8408.120
¹⁴¹ Pr	-86026.3	1177923.3			-1320.50	9397.6	5226.912
¹⁴¹ Nd	-84203.4	1175318.4		1823.3	-720.50	7797.19	6792.7
¹⁴¹ Pm	-80470.30	1170810.30		3730.30	300.60	10120.40	3290.30
¹⁴¹ Sm	-75946.12	1165497.12		4530.30	1140.70	8558.19	4800.30
¹⁴¹ Eu	-69970.30	1158740.30		5980.30	(1460)	11050.60	1800.30
¹⁴¹ Gd	(-63100)	(1151100)		(6800)	(2400)	(9700)	(3400)
¹⁴¹ Tb	(-54800)	(1142000)		(8300)	(3100)	(12200)	(600)
¹⁴¹ Dy	(-45500)	(1131900)		(9300)	(3700)	(10500)	(2000)
¹⁴² Te	(-48000)	(1153400)	(7800)			(4200)	
¹⁴² I	(-55700)	(1160400)	(9800)		(-3200)	(3100)	(11200)
¹⁴² Xe	-65480.100	1169360.100	5040.100		(-1980)	5220.140	(12100)
¹⁴² Cs	-70521.11	1173620.11	7307.10		-650.80	4114.14	9480.90
¹⁴² Ba	-77828.6	1180144.6	2211.4		-130.40	6169.10	10638.12
¹⁴² La	-80039.6	1181573.6	4504.5		429.11	5167.7	7598.9
¹⁴² Ce	-84543.3	1185294.3			1300.3	7169.024	8889.5
¹⁴² Pr	-83797.3	1183766.3	2162.215	745.324	307.3	5843.0610	5641.411
¹⁴² Nd	-85960.3	1185146.3			-811.10	9828.3	7222.915
¹⁴² Pm	-81090.40	1179490.40		4870.40	-370.40	8680.50	4170.40
¹⁴² Sm	-78997.11	1176619.11		2090.40	(620)	11122.16	5810.30
¹⁴² Eu	-71350.30	1168190.30		7640.30	(1300)	9460.40	2700.30
¹⁴² Gd	(-66900)	(1162900)		(4500)	(1900)	(11800)	(4200)
¹⁴² Tb	(-57000)	(1152200)		(9900)	(2600)	(10200)	(1100)
¹⁴² Dy	(-50100)	(1144500)		(6900)	(3400)	(12700)	(2500)
¹⁴² Ho	(-37400)	(1131100)		(12700)	(4100)		(-800)
¹⁴³ I	(-52100)	(1164800)	(8600)		(-4000)	(4400)	(11400)
¹⁴³ Xe	(-60650)	(1172600)	(7040)		(-2300)	(3240)	(12200)
¹⁴³ Cs	-67691.22	1178861.22	6253.20		-1270.40	5241.24	9500.100
¹⁴³ Ba	-73945.13	1184332.13	4246.18		-720.25	4188.14	10712.16
¹⁴³ La	-78191.15	1187796.15	3426.15		91.16	6223.16	7652.16
¹⁴³ Ce	-81616.3	1190439.3	1461.418		878.3	5145.13	8866.5
¹⁴³ Pr	-83078.3	1191118.3	933.914		1733.3	7351.919	5824.218
¹⁴³ Nd	-84012.3	1191270.3			521.7	6123.5913	7503.415
¹⁴³ Pm	-82970.4	1189446.4		1041.424	-566.8	9960.40	4299.924
¹⁴³ Sm	-79528.4	1185221.4		3443.4	90.50	8602.11	5730.40
¹⁴³ Eu	-74253.13	1179163.13		5275.14	860.60	10970.30	2545.17
¹⁴³ Gd	-68240.200	1172370.200		6010.200	1710.200	(9500)	4180.200

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁴³ Tb	(-60800)	(1164100)		(7500)	(2200)	(11900)	(1200)
¹⁴³ Dy	(-52300)	(1154900)		(8500)	(2900)	(10300)	(2700)
¹⁴³ Ho	(-42200)	(1144000)		(10100)	(3800)	(12900)	(-600)
¹⁴⁴ I	(-46900)	(1167700)	(10600)			(2900)	
¹⁴⁴ Xe	(-57500)	(1177600)	(5800)		(-2900)	(5000)	(12700)
¹⁴⁴ Cs	-63320 30	1182560 30	8460 30		(-1660)	3700 30	(9960)
¹⁴⁴ Ba	-71780 14	1190239 14	3120 60		-1210 60	5907 18	11378 25
¹⁴⁴ La	-74900 60	1192580 60	5540 60		-270 60	4780 60	8240 60
¹⁴⁴ Ce	-80441 4	1197335 4	318.7 8		410 9	6896 3	9539 15
¹⁴⁴ Pr	-80760 4	1196872 4	2997.5 24		1141 3	5753 3	6433 3
¹⁴⁴ Nd	-83757 3	1199087 3			1905.2 18	7817.02 7	7968.6 14
¹⁴⁴ Pm	-81426 4	1195973 4	551 3	2331.7 22	849 7	6526.7 15	4703.0 22
¹⁴⁴ Sm	-81976 3	1195741 3			76 19	10520.1 24	6295 3
¹⁴⁴ Eu	-75661 18	1188644 18		6315 17	340 30	9480 22	3423 17
¹⁴⁴ Gd	(-71920)	(1184120)		(3740)	(1110)	(11800)	(4960)
¹⁴⁴ Tb	(-62800)	(1174300)		(9100)	(1700)	(10100)	(1900)
¹⁴⁴ Dy	(-56800)	(1167400)		(6100)	(2300)	(12500)	(3300)
¹⁴⁴ Ho	(-45000)	(1154900)		(11700)	(3300)	(10900)	(0)
¹⁴⁴ Er	(-36700)	(1145800)		(8300)	(3900)		(1800)
¹⁴⁵ Xe	(-52500)	(1180600)	(7700)		(-3100)	(3000)	(12800)
¹⁴⁵ Cs	-60190 50	1187500 50	7880 40		(-1900)	4940 40	(9900)
¹⁴⁵ Ba	-68070 60	1194600 60	4920 70		-2170 110	4360 60	12040 60
¹⁴⁵ La	-72990 70	1198740 70	4110 70		-940 70	6160 90	8500 70
¹⁴⁵ Ce	-77100 40	1202070 40	2530 40		200 40	4730 40	9490 70
¹⁴⁵ Pr	-79636 8	1203819 8	1805 7		882 8	6948 7	6484 8
¹⁴⁵ Nd	-81442 3	1204842 3			1578.4 19	5755.4 6	7970.6 25
¹⁴⁵ Pm	-81279 4	1203897 4		163.0 22	2322 3	7924.0 15	4810.0 22
¹⁴⁵ Sm	-80662 3	1202498 3		616.4 24	1116 4	6757.1 3	6525 3
¹⁴⁵ Eu	-78002 4	1199056 4		2660 3	50 30	10412 17	3315 3
¹⁴⁵ Gd	-72950 40	1193220 40		5050 40	570 40	(9100)	4580 40
¹⁴⁵ Tb	(-66250)	(1185740)		(6700)	(1300)	(11500)	(1600)
¹⁴⁵ Dy	(-58700)	(1177400)		(7520)	(2000)	(10000)	(3200)
¹⁴⁵ Ho	(-49500)	(1167400)		(9200)	(2900)	(12500)	(0)
¹⁴⁵ Er	(-39600)	(1156800)		(9900)	(3400)	(11000)	(1900)
¹⁴⁶ Xe	(-49100)	(1185300)	(6600)		(-3500)	(4700)	
¹⁴⁶ Cs	-55740 80	1191120 80	9370 40		(-2400)	3620 70	(10600)
¹⁴⁶ Ba	-65110 80	1199710 80	4100 40		-2050 130	5110 80	12210 70
¹⁴⁶ La	-69210 70	1203030 70	6530 50		-1110 70	4290 90	8430 80
¹⁴⁶ Ce	-75740 70	1208780 70	1030 40		-340 70	6710 70	10040 90
¹⁴⁶ Pr	-76770 60	1209020 60	4170 60		850 60	5200 60	6950 70
¹⁴⁶ Nd	-80936 3	1212407 3			1182.2 22	7565.25 14	8588 7
¹⁴⁶ Pm	-79464 5	1210153 5	1542 3	1472 4	1909 4	6257 5	5311 4
¹⁴⁶ Sm	-81006 4	1210913 4			2529 3	8415 3	7016 3
¹⁴⁶ Eu	-77128 7	1206253 7		3878 6	1530 40	7197 7	3755 7
¹⁴⁶ Gd	-76098 5	1204441 5		1030 8	474 11	11220 40	5385 5
¹⁴⁶ Tb	-67830 50	1195390 50		8270 50	1100 50	(9660)	2170 60
¹⁴⁶ Dy	-62670 110	1189450 110		5160 100	(1800)	(12000)	(3710)
¹⁴⁶ Ho	(-52100)	(1178100)		(10600)	(2500)	(10700)	(600)
¹⁴⁶ Er	(-44600)	(1169800)		(7500)	(3000)	(13000)	(2400)
¹⁴⁶ Tm	(-31200)	(1155600)		(13400)	(3800)		-1127 5
¹⁴⁷ Xe	(-43800)	(1188000)	(8500)			(2800)	
¹⁴⁷ Cs	-52290 150	1195750 150	9200 180		(-2600)	4620 140	(10500)
¹⁴⁷ Ba	-61490 90	1204160 90	5750 50		(-3260)	4450 120	13040 120
¹⁴⁷ La	-67240 80	1209130 80	4950 60		-1970 80	6100 110	9420 110
¹⁴⁷ Ce	-72180 50	1213290 50	3290 40		-660 60	4510 80	10260 90
¹⁴⁷ Pr	-75470 40	1215800 40	2690 40		300 40	6780 70	7020 70
¹⁴⁷ Nd	-78156 3	1217700 3	896.0 9		1035.3 22	5292.07 15	8680 60
¹⁴⁷ Pm	-79052 3	1217813 3	224.1 3		1600.7 17	7660 4	5405.7 9
¹⁴⁷ Sm	-79276 3	1217255 3			2310.5 11	6342 3	7102 4
¹⁴⁷ Eu	-77555 4	1214751 4		1721.3 23	2990 3	8498 7	3838 4
¹⁴⁷ Gd	-75368 4	1211782 4		2187 3	1735.0 20	7341 4	5529 7
¹⁴⁷ Tb	-70759 12	1206390 12		4609 11	1069 18	11000 50	1950 12
¹⁴⁷ Dy	-64390 50	1199240 50		6370 50	1430 210	9790 120	3840 70
¹⁴⁷ Ho	(-56000)	(1190100)		(8300)	(2300)	(12000)	(700)
¹⁴⁷ Er	(-47200)	(1180500)		(8800)	(2700)	(10700)	(2400)
¹⁴⁷ Tm	(-36300)	(1168800)		(11000)	(3500)	(13100)	-1058 3
¹⁴⁸ Cs	-47600 600	1199100 600	10400 600		(-3100)	3400 600	(11100)
¹⁴⁸ Ba	-58050 140	1208790 140	5120 60		(-2900)	4630 170	13050 210
¹⁴⁸ La	-63160 130	1213130 130	7260 50		-2270 130	4000 150	8970 160
¹⁴⁸ Ce	-70430 120	1219610 120	2060 80		-1070 120	6320 130	10480 140

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁴⁶ Pr	-72490 90	1220880 90	4930 90		-10 110	5090 100	7590 100
¹⁴⁸ Nd	-77418 3	1225032 3			599 3	7332.9 16	9240 40
¹⁴⁸ Pm	-76878 7	1223711 7	2468 6	540 6	1457 7	5897 6	6011 6
¹⁴⁸ Sm	-79347 3	1225397 3			1986.0 12	8141.5 6	7583.3 7
¹⁴⁸ Eu	-76239 18	1221507 18	41 17	3107 17	2762 17	6756 17	4252 17
¹⁴⁸ Gd	-76280 3	1220765 3			3271.21 3	8983.9 14	6014 3
¹⁴⁸ Tb	-70520 30	1214220 30		5760 30	2720 30	7830 30	2440 30
¹⁴⁸ Dy	-67830 30	1210750 30		2682 10	(1660)	11520 60	4360 30
¹⁴⁸ Ho	(-58400)	(1200600)		(9400)	(2000)	(10500)	(1300)
¹⁴⁸ Er	(-51800)	(1193100)		(6700)	(2600)	(12600)	(3000)
¹⁴⁸ Tm	(-39500)	(1180100)		(12200)	(3100)	(11400)	(-400)
¹⁴⁸ Yb	(-31000)	(1170800)		(8600)	(3300)		(2000)
¹⁴⁹ Cs	(-44000)	(1203600)	(9600)			(4500)	
¹⁴⁹ Ba	(-53600)	(1212400)	(7500)		(-3600)	(3600)	(13300)
¹⁴⁹ La	(-61100)	(1219200)	(5700)		(-3400)	(6000)	(10400)
¹⁴⁹ Ce	-66800 80	1224050 80	4190 80		-1150 100	4440 140	10920 150
¹⁴⁹ Pr	-70988 11	1227456 11	3397 10		-420 70	6570 90	7850 120
¹⁴⁹ Nd	-74385 3	1230071 3	1691 3		290 40	5038.68 10	9190 90
¹⁴⁹ Pm	-76076 4	1230979 4	1071 4		1136 8	7269 7	5947 3
¹⁴⁹ Sm	-77147 3	1231268 3			1869.9 12	5871.5 9	7557 6
¹⁴⁹ Eu	-76452 5	1229790 5		695 4	2402 4	8284 18	4394 4
¹⁴⁹ Gd	-75138 4	1227694 4		1314 4	3100 3	6929 3	6187 18
¹⁴⁹ Tb	-71500 5	1223274 5		3638 4	4077.2 24	9060 30	2509 4
¹⁴⁹ Dy	-67688 11	1218680 11		3812 10	2830 40	7930 30	4460 30
¹⁴⁹ Ho	-61674 22	1211884 22		6014 19	(2150)	(11300)	1130 40
¹⁴⁹ Er	(-53900)	(1203300)		(7800)	(2400)	(10200)	(2700)
¹⁴⁹ Tm	(-44100)	(1192800)		(9800)	(3000)	(12600)	(-400)
¹⁴⁹ Yb	(-34000)	(1181900)		(10100)	(3200)	(11100)	(1800)
¹⁵⁰ Cs	(-39200)	(1206800)	(11500)			(3200)	
¹⁵⁰ Ba	(-50700)	(1217500)	(6600)		(-4000)	(5100)	(13900)
¹⁵⁰ La	(-57200)	(1223300)	(7800)		(-3900)	(4200)	(10900)
¹⁵⁰ Ce	-64990 120	1230320 120	3010 90		-2310 140	6270 140	(11100)
¹⁵⁰ Pr	-68000 80	1232540 80	5690 80		-1220 110	5090 80	8490 110
¹⁵⁰ Nd	-73694 4	1237451 4			-380 70	7380 3	9994 10
¹⁵⁰ Pm	-73607 20	1236582 20	3454 20	87 20	730 60	5603 20	6511 20
¹⁵⁰ Sm	-77061 3	1239254 3			1449.5 12	7985.7 7	8274 4
¹⁵⁰ Eu	-74801 7	1236211 7	971 4	2261 6	2238 7	6420 7	4943 6
¹⁵⁰ Gd	-75772 7	1236400 7			2809 6	8706 7	6609 7
¹⁵⁰ Tb	-71116 8	1230961 8		4656 9	3587 5	7687 9	3267 8
¹⁵⁰ Dy	-69322 5	1228385 5		1794 9	4351.1 15	9705 11	5111 6
¹⁵⁰ Ho	(-62080)	(1220360)		(7240)	(3320)	(8480)	(1680)
¹⁵⁰ Er	(-57970)	(1215470)		4108 15	(2270)	(12200)	(3590)
¹⁵⁰ Tm	(-46900)	(1203600)		(11100)	(2800)	(10800)	(300)
¹⁵⁰ Yb	(-39100)	(1195100)		(7800)	(3000)	(13200)	(2300)
¹⁵⁰ Lu	(-25500)	(1180600)		(13700)	(3300)		-1270 3
¹⁵¹ Cs	(-35400)	(1211100)	(10500)			(4300)	
¹⁵¹ Ba	(-45900)	(1220900)	(8500)		(-4600)	(3300)	(14100)
¹⁵¹ La	(-54400)	(1228600)	(7000)		(-4600)	(5300)	(11100)
¹⁵¹ Ce	(-61400)	(1234800)	(5400)		(-2400)	(4500)	(11500)
¹⁵¹ Pr	-66860 40	1239470 40	4100 40		-2040 90	6920 90	9150 130
¹⁵¹ Nd	-70957 4	1242785 4	2442 4		-1200 50	5334.43 20	10240 80
¹⁵¹ Pm	-73399 6	1244445 6	1187 5		-350 40	7863 21	6995 4
¹⁵¹ Sm	-74586 3	1244850 3	76.7 5		1145.1 12	5596.44 10	8268 20
¹⁵¹ Eu	-74663 3	1244144 3			1964.4 11	7934 6	4890.8 5
¹⁵¹ Gd	-74199 4	1242898 4		464 3	2653 3	6498 7	6687 7
¹⁵¹ Tb	-71634 5	1239550 5		2565 4	3497 4	8589 9	3151 7
¹⁵¹ Dy	-68763 4	1235898 4		2870 5	4180 3	7513 5	4937 8
¹⁵¹ Ho	-63639 12	1229991 12		5124 12	4695.1 19	(9630)	1606 12
¹⁵¹ Er	(-58300)	(1223800)		(5400)	(3700)	(8400)	(3500)
¹⁵¹ Tm	(-50830)	(1215620)		(7400)	(2800)	(12000)	(140)
¹⁵¹ Yb	(-41700)	(1205700)		(9100)	(3100)	(10600)	(2100)
¹⁵¹ Lu	(-30600)	(1193800)		(11100)	(3200)	(13200)	(-1240)
¹⁵² Ba	(-42700)	(1225700)	(7500)			(4800)	(14600)
¹⁵² La	(-50200)	(1232400)	(9100)		(-5000)	(3800)	(11600)
¹⁵² Ce	(-59300)	(1240700)	(4500)		(-3600)	(5900)	(12100)
¹⁵² Pr	(-63700)	(1244400)	(6400)		(-3000)	(4900)	(9600)
¹⁵² Nd	-70160 30	1250060 30	1110 80		-2160 120	7270 30	10590 50
¹⁵² Pm	-71270 70	1250390 70	3500 70		-1210 110	5940 70	7600 70
¹⁵² Sm	-74773 3	1253108 3			220.3 21	8257.7 7	8662 5
¹⁵² Eu	-72898 3	1250451 3	1818.8 11	1874.3 7	1555 6	6306.72 10	5601.1 5

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁵² Gd	-74717 3	1251488 3			2204.6 14	8590 3	7343.1 11
¹⁵² Tb	-70730 40	1246720 40		3990 40	3090 40	7160 40	3820 40
¹⁵² Dy	-70129 5	1245334 5		600 40	3727 4	9437 5	5784 6
¹⁵² Ho	-63580 30	1238010 30		6550 30	4507.2 13	8020 30	2110 30
¹⁵² Er	-60470 30	1234120 30		3109 10	4934.4 16	(10300)	4120 30
¹⁵² Tm	(-51900)	(1224700)		(8600)	(4100)	(9100)	(900)
¹⁵² Yb	(-46400)	(1218500)		5470 200	(2900)	(12800)	(2900)
¹⁵² Lu	(-33900)	(1205200)		(12500)	(3200)	(11400)	(-500)
¹⁵³ Ba	(-37600)	(1228700)	(9500)			(3000)	
¹⁵³ La	(-47100)	(1237400)	(8300)		(-5500)	(5000)	(11700)
¹⁵³ Ce	(-55300)	(1244900)	(6500)		(-4200)	(4200)	(12400)
¹⁵³ Pr	(-61800)	(1250600)	(5500)		(-3100)	(6200)	(9800)
¹⁵³ Nd	-67350 30	1255320 30	3336 25		-2980 80	5270 40	(10900)
¹⁵³ Pm	-70688 11	1257877 11	1881 11		-2125 15	7490 70	7820 30
¹⁵³ Sm	-72569 3	1258976 3	808.2 8		-608.8 21	5867.72 23	8590 70
¹⁵³ Eu	-73377 3	1259001 3			274 4	8550.28 12	5893.6 7
¹⁵³ Gd	-72893 3	1257735 3		484.4 11	1829.0 13	6247.08 13	7283.5 11
¹⁵³ Tb	-71324 5	1255383 5		1569 4	2703 5	8670 40	3896 4
¹⁵³ Dy	-69153 5	1252430 5		2170.4 19	3559 4	7096 6	5720 40
¹⁵³ Ho	-65023 6	1247518 6		4130 6	4052 4	9510 30	2184 7
¹⁵³ Er	-60460 11	1242173 11		4563 11	4802.7 15	8060 30	4170 30
¹⁵³ Tm	-54001 22	1234931 22		6459 19	5248.4 14	(10200)	820 40
¹⁵³ Yb	(-47300)	(1227500)		(6700)	(4100)	(9000)	(2700)
¹⁵³ Lu	(-38500)	(1217800)		(8800)	(3200)	(12700)	(-700)
¹⁵⁴ La	(-42500)	(1240900)	(10300)		(-5800)	(3500)	(12100)
¹⁵⁴ Ce	(-52800)	(1250400)	(5500)		(-4600)	(5500)	(13000)
¹⁵⁴ Pr	(-58300)	(1255100)	(7400)		(-3500)	(4600)	(10300)
¹⁵⁴ Nd	-65690 110	1261730 110	2740 140		-3120 170	6410 120	(11200)
¹⁵⁴ Pm	-68420 70	1263680 70	4040 70		-2840 110	5800 70	8360 80
¹⁵⁴ Sm	-72465 3	1266943 3			-1196.5 24	7967.6 9	9066 11
¹⁵⁴ Eu	-71748 3	1265443 3	1968.4 11	717.3 11	-566 20	6442.0 3	6467.9 8
¹⁵⁴ Gd	-73716 3	1266629 3			919.9 11	8894.77 17	7628.0 11
¹⁵⁴ Tb	-70150 50	1262290 50	250 50	3560 50	2220 50	6900 50	4550 50
¹⁵⁴ Dy	-70400 9	1261749 9			2947 5	9318 9	6366 9
¹⁵⁴ Ho	-64649 9	1255215 9		5751 11	4042 4	7697 10	2785 9
¹⁵⁴ Er	-62618 6	1252401 6		2032 10	4280 3	10229 12	4883 7
¹⁵⁴ Tm	(-54560)	(1243570)		(8050)	5090 50	(8630)	(1390)
¹⁵⁴ Yb	(-50080)	(1238290)		4490 50	5474.3 19	(10800)	(3360)
¹⁵⁴ Lu	(-40000)	(1227400)		(10100)	(4500)	(9600)	(-100)
¹⁵⁴ Hf	(-33300)	(1220000)		(6700)	(3400)		(2100)
¹⁵⁵ La	(-39000)	(1245500)	(9400)		(-6000)	(4600)	
¹⁵⁵ Ce	(-48400)	(1254100)	(7500)		(-4900)	(3700)	(13200)
¹⁵⁵ Pr	(-55900)	(1260800)	(6900)		(-3900)	(5600)	(10400)
¹⁵⁵ Nd	-62760 150	1266870 150	4220 150		(-3700)	5140 190	(11700)
¹⁵⁵ Pm	-66980 30	1270310 30	3220 30		-2550 50	6630 80	8580 120
¹⁵⁵ Sm	-70201 3	1272750 3	1626.9 12		-1669.3 25	5807.2 3	9070 70
¹⁵⁵ Eu	-71828 3	1273595 3	252.1 11		-854 5	8151.4 4	6651.7 12
¹⁵⁵ Gd	-72080 3	1273065 3			81.2 12	6435.1 3	7621.1 11
¹⁵⁵ Tb	-71259 12	1271461 12		821 12	979 12	9180 50	4832 12
¹⁵⁵ Dy	-69164 12	1268584 12		2094.5 19	2610 12	6835 14	6300 50
¹⁵⁵ Ho	-66062 23	1264700 23		3102 20	3146 24	9485 25	2951 25
¹⁵⁵ Er	-62220 50	1260070 50		3840 60	4120 50	7670 50	4860 50
¹⁵⁵ Tm	-56643 13	1253715 13		5580 50	4571 5	(10150)	1314 14
¹⁵⁵ Yb	(-50500)	(1246800)		(6100)	5337 3	(8500)	(3200)
¹⁵⁵ Lu	(-42630)	(1238140)		(7900)	(5771)	(10700)	-150 90
¹⁵⁵ Hf	(-34700)	(1229400)		(7900)	(4600)	(9500)	(2000)
¹⁵⁶ Ce	(-45400)	(1259200)	(6700)		(-5100)	(5100)	(13700)
¹⁵⁶ Pr	(-52100)	(1265000)	(8300)		(-4300)	(4200)	(10900)
¹⁵⁶ Nd	(-60400)	(1272500)	(3900)		(-3500)	(5700)	(11800)
¹⁵⁶ Pm	-64220 40	1275620 40	5160 40		(-2900)	5310 50	8750 160
¹⁵⁶ Sm	-69372 10	1279992 10	722 8		-1640 30	7242 9	9680 30
¹⁵⁶ Eu	-70094 6	1279932 6	2451 5		-1250 70	6337 5	7182 5
¹⁵⁶ Gd	-72545 3	1281601 3			-197.4 12	8536.37 12	8006.1 11
¹⁵⁶ Tb	-70101 5	1278374 5	434 7	2444 4	373 4	6913 12	5310 4
¹⁵⁶ Dy	-70534 7	1278025 7			1758 6	9441 10	6564 10
¹⁵⁶ Ho	(-65470)	(1272180)		(5060)	(2830)	(7480)	(3600)
¹⁵⁶ Er	-64260 70	1270190 70		(1220)	3440 70	10110 90	5490 80
¹⁵⁶ Tm	-56810 60	1261960 60		7440 40	4340 50	8240 60	1880 80
¹⁵⁶ Yb	-53240 30	1257600 30		3580 50	4812 7	(10800)	3880 40
¹⁵⁶ Lu	(-43900)	(1247400)		(9400)	5590 50	(9300)	(700)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁵⁶ Hf	(-38000)	(1240800)		5910 200	6033 10	(11300)	(2600)
¹⁵⁶ Ta	(-26400)	(1228400)		(11600)	(5100)		-1029 13
¹⁵⁷ Ce	(-40700)	(1262500)	(8500)		(-5500)	(3300)	
¹⁵⁷ Pr	(-49200)	(1270300)	(7400)		(-4500)	(5200)	(11100)
¹⁵⁷ Nd	(-56600)	(1276800)	(5700)		(-3600)	(4300)	(11800)
¹⁵⁷ Pm	(-62200)	(1281700)	(4500)		(-2800)	(6100)	(9200)
¹⁵⁷ Sm	-66740 50	1285430 50	2730 50		-1810 60	5440 50	9810 60
¹⁵⁷ Eu	-69471 6	1287381 6	1363 6		-1208 12	7449 8	7388 11
¹⁵⁷ Gd	-70834 3	1287961 3			-689.7 12	6360.04 15	8029 5
¹⁵⁷ Tb	-70774 3	1287119 3		60.1 3	178.6 11	8744 4	5517.6 3
¹⁵⁷ Dy	-69432 7	1284995 7		1341 6	1036 6	6969 6	6621 7
¹⁵⁷ Ho	-66890 50	1281670 50		2540 50	2010 50	(9490)	3650 50
¹⁵⁷ Er	-63390 80	1277390 80		3500 60	3340 80	7200 110	(5210)
¹⁵⁷ Tm	-58910 110	1272130 110		4480 70	3690 110	10170 120	1940 130
¹⁵⁷ Yb	-53410 50	1265850 50		5500 120	4620 50	8250 60	3890 80
¹⁵⁷ Lu	-46480 22	1258131 22		6930 50	5096 3	(10700)	530 40
¹⁵⁷ Hf	(-39000)	(1249900)		(7500)	5880 50	(9100)	(2400)
¹⁵⁷ Ta	(-29700)	(1239800)		(9300)	6380 50	(11400)	(-1000)
¹⁵⁸ Pr	(-44900)	(1274000)	(9200)		(-4900)	(3800)	(11500)
¹⁵⁸ Nd	(-54100)	(1282500)	(4800)		(-3800)	(5600)	(12200)
¹⁵⁸ Pm	(-59000)	(1286500)	(6200)		(-3100)	(4800)	(9700)
¹⁵⁸ Sm	-65220 80	1291980 80	1999 15		-1950 140	6550 90	(10300)
¹⁵⁸ Eu	-67210 80	1293200 80	3490 80		-1220 110	5810 80	7770 90
¹⁵⁸ Gd	-70700 3	1295898 3			-659.5 13	7937.33 12	8518 6
¹⁵⁸ Tb	-69480 3	1293896 3	936.7 24	1220.0 9	-156.8 14	6777.4 9	5935.0 9
¹⁵⁸ Dy	-70417 4	1294050 4			874.8 24	9056 6	6931.8 24
¹⁵⁸ Ho	-66190 30	1289040 30		4230 30	1540 60	7370 60	4040 30
¹⁵⁸ Er	(-65290)	(1287360)		(900)	(2690)	(9970)	(5680)
¹⁵⁸ Tm	(-58690)	(1279970)		6600 50	(3540)	(7850)	(2580)
¹⁵⁸ Yb	-56022 10	1276526 10		(2670)	4171 8	10680 50	4400 110
¹⁵⁸ Lu	(-47350)	(1267070)		(8670)	4790 50	(8940)	(1220)
¹⁵⁸ Hf	(-42250)	(1261190)		5100 70	5403 4	(11300)	(3060)
¹⁵⁸ Ta	(-31300)	(1249500)		(10900)	6210 50	(9700)	(-400)
¹⁵⁸ W	(-24300)	(1241700)		(7100)	6600 30		(1900)
¹⁵⁹ Pr	(-41700)	(1278900)	(8200)		(-5100)	(4900)	
¹⁵⁹ Nd	(-49900)	(1286300)	(6800)		(-4000)	(3900)	(12300)
¹⁵⁹ Pm	(-56700)	(1292300)	(5500)		(-3200)	(5800)	(9800)
¹⁵⁹ Sm	(-62200)	(1297100)	(3800)		(-1900)	(5100)	(10500)
¹⁵⁹ Eu	-66057 8	1300109 8	2514 7		-1510 30	6910 80	8130 80
¹⁵⁹ Gd	-68572 3	1301842 3	970.6 7		-795.6 13	5943.29 15	8650 80
¹⁵⁹ Tb	-69542 3	1302030 3			-139.3 13	8133.9 5	6131.5 7
¹⁵⁹ Dy	-69177 3	1300882 3		365.6 12	478.4 13	6831.5 24	6985.9 13
¹⁵⁹ Ho	-67339 4	1298262 4		1838 3	1495 12	9220 30	4211 4
¹⁵⁹ Er	-64570 5	1294711 5		2768.6 20	2169 12	(7360)	5670 30
¹⁵⁹ Tm	-60730 70	1290080 70		3850 70	2910 70	(10110)	(2730)
¹⁵⁹ Yb	-55750 90	1284320 90		4980 90	4050 100	7800 90	(4350)
¹⁵⁹ Lu	-49730 50	1277520 50		6020 90	4490 50	(10450)	990 50
¹⁵⁹ Hf	(-42800)	(1269900)		(6900)	5220 50	(8700)	(2800)
¹⁵⁹ Ta	(-34550)	(1260770)		(8300)	5660 50	(11300)	-410 70
¹⁵⁹ W	(-25800)	(1251300)		(8700)	6440 50	(9600)	(1800)
¹⁶⁰ Nd	(-47100)	(1291600)	(6000)		(-4200)	(5300)	(12700)
¹⁶⁰ Pm	(-53100)	(1296800)	(7300)		(-3500)	(4500)	(10500)
¹⁶⁰ Sm	(-60400)	(1303300)	(3000)		(-2500)	(6300)	(11000)
¹⁶⁰ Eu	(-63370)	(1305500)	(4580)		(-1580)	(5390)	(8400)
¹⁶⁰ Gd	-67952 3	1309293 3			-1005 9	7451.4 7	9184 7
¹⁶⁰ Tb	-67846 3	1308405 3	1835.3 13	105.6 10	-177 5	6375.2 3	6563.4 8
¹⁶⁰ Dy	-69682 3	1309458 3			438.7 12	8576.1 14	7428.1 13
¹⁶⁰ Ho	-66392 15	1305386 15		3290 15	1284 15	7124 15	4504 15
¹⁶⁰ Er	-66060 50	1304270 50		330 50	2050 50	9560 50	6010 50
¹⁶⁰ Tm	-60500 300	1297900 300		5600 300	(2600)	7800 300	3200 300
¹⁶⁰ Yb	(-58160)	(1294810)		(2300)	(3670)	(10490)	(4730)
¹⁶⁰ Lu	(-50280)	(1286150)		(7880)	(4110)	(8630)	(1830)
¹⁶⁰ Hf	-45910 30	1280990 30		(4370)	4903 3	(11100)	3470 60
¹⁶⁰ Ta	(-36000)	(1270300)		(9900)	5450 50	(9500)	(400)
¹⁶⁰ W	(-29500)	(1263000)		6530 210	6072 10	(11700)	(2200)
¹⁶⁰ Re	(-17200)	(1250000)		(12200)	6699 13		-1290 50
¹⁶¹ Nd	(-42500)	(1295100)	(7900)		(-4300)	(3500)	
¹⁶¹ Pm	(-50400)	(1302200)	(6500)		(-3600)	(5400)	(10600)
¹⁶¹ Sm	(-57000)	(1308000)	(4800)		(-2800)	(4600)	(11200)
¹⁶¹ Eu	(-61800)	(1312000)	(3700)		(-2000)	(6500)	(8600)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁶¹ Gd	-65516 3	1314928 3	1955.6 14		-1200 50	5635.4 10	(9430)
¹⁶¹ Tb	-67472 3	1316102 3	593.1 14		-425 6	7696.6 5	6808.6 10
¹⁶¹ Dy	-68065 3	1315912 3			344.3 12	6454.36 9	7507.3 13
¹⁶¹ Ho	-67206 4	1314271 4		859 3	1143 3	8885 15	4813 3
¹⁶¹ Er	-65203 10	1311486 10		2002 9	1804 11	7210 50	6101 18
¹⁶¹ Tm	-62040 90	1307540 90		3160 90	2430 100	9600 300	3270 100
¹⁶¹ Yb	(-57890)	(1302610)		(4150)	(3080)	(7800)	(4700)
¹⁶¹ Lu	(-52590)	(1296530)		5300 100	(3900)	(10400)	(1700)
¹⁶¹ Hf	-46270 70	1289420 70		(6320)	4720 50	8430 80	(3270)
¹⁶¹ Ta	-38780 50	1281150 50		7490 90	5280 50	(10900)	150 60
¹⁶¹ W	(-30700)	(1272200)		(8100)	5920 50	(9300)	(2000)
¹⁶¹ Re	(-20800)	(1261600)		(9800)	6440 50	(11600)	(-1400)
¹⁶² Pm	(-46300)	(1306100)	(8400)		(-3800)	(3900)	(11100)
¹⁶² Sm	(-54800)	(1313800)	(3900)		(-3000)	(5800)	(11600)
¹⁶² Eu	(-58600)	(1316900)	(5600)		(-2100)	(4900)	(9000)
¹⁶² Gd	-64291 5	1321774 5	1390 40		-1500 80	6846 4	(9800)
¹⁶² Tb	-65680 40	1322390 40	2510 40		-890 90	6280 40	7460 40
¹⁶² Dy	-68190 3	1324109 3			84.7 12	8196.95 12	8007.7 14
¹⁶² Ho	-66050 4	1321187 4	296 4	2140 4	1005 4	6916 4	5274 4
¹⁶² Er	-66346 4	1320700 4			1646 3	9214 9	6429 3
¹⁶² Tm	-61510 30	1315080 30		4840 30	2260 40	7540 90	3590 30
¹⁶² Yb	(-59850)	(1312640)		(1660)	(3010)	(10000)	(5100)
¹⁶² Lu	(-52890)	(1304900)		6960 80	(3370)	(8400)	(2300)
¹⁶² Hf	-49180 11	1300405 11		(3710)	4417 6	10980 70	(3880)
¹⁶² Ta	(-39920)	(1290360)		(9260)	5010 50	(9210)	(940)
¹⁶² W	(-34150)	(1283810)		5770 90	5674 3	(11600)	(2660)
¹⁶² Re	(-22600)	(1271500)		(11500)	6270 50	(9900)	(-700)
¹⁶² Os	(-15100)	(1263200)		(7600)	6780 30		(1600)
¹⁶³ Pm	(-43300)	(1311200)	(7600)		(-4000)	(5100)	
¹⁶³ Sm	(-50900)	(1318000)	(5700)		(-3400)	(4200)	(11900)
¹⁶³ Eu	(-56600)	(1323000)	(4900)		(-2400)	(6100)	(9200)
¹⁶³ Gd	(-61500)	(1327000)	(3100)		(-1700)	(5300)	(10100)
¹⁶³ Tb	-64605 5	1329377 5	1785 4		-972 9	6990 40	7603 6
¹⁶³ Dy	-66390 3	1330380 3			-242.9 13	6270.93 7	7990 40
¹⁶³ Ho	-66387 3	1329595 3		2.565 14	730.2 13	8409 4	5486.01 7
¹⁶³ Er	-65177 5	1327603 5		1210 5	1575 5	6903 5	6416 6
¹⁶³ Tm	-62738 6	1324382 6		2439 3	2176 6	9300 30	3682 6
¹⁶³ Yb	-59370 100	1320230 100		3370 100	2780 100	(7590)	5150 100
¹⁶³ Lu	-54770 220	1314850 220		4600 200	3530 230	(10000)	(2200)
¹⁶³ Hf	(-49300)	(1308600)		(5500)	(4000)	(8200)	(3700)
¹⁶³ Ta	-42550 70	1301070 70		(6800)	4750 50	(10710)	660 70
¹⁶³ W	(-34900)	(1292600)		(7700)	5520 50	(8800)	(2300)
¹⁶³ Re	(-26110)	(1283060)		(8800)	6010 50	(11600)	-750 50
¹⁶³ Os	(-16700)	(1272900)		(9400)	6670 50	(9700)	(1400)
¹⁶⁴ Sm	(-48200)	(1323400)	(4900)		(-3500)	(5400)	(12200)
¹⁶⁴ Eu	(-53100)	(1327500)	(6600)		(-2400)	(4600)	(9500)
¹⁶⁴ Gd	(-59700)	(1333400)	(2300)		(-1800)	(6300)	(10400)
¹⁶⁴ Tb	-62090 100	1334930 100	3890 100		(-1140)	5550 100	(7900)
¹⁶⁴ Dy	-65977 3	1338038 3			-449.6 13	7658.08 12	8661 4
¹⁶⁴ Ho	-64990 3	1336269 3	962.8 23	986.8 22	431.6 23	6673.8 22	5888.9 22
¹⁶⁴ Er	-65953 3	1336450 3			1304.1 24	8847 5	6854.2 24
¹⁶⁴ Tm	-61990 19	1331705 19		3963 19	1977 24	7323 19	4102 19
¹⁶⁴ Yb	(-60990)	(1329930)		(1000)	(2640)	(9700)	(5550)
¹⁶⁴ Lu	(-54760)	(1322910)		6240 70	(3300)	(8100)	(2680)
¹⁶⁴ Hf	(-51770)	(1319140)		(2990)	(4000)	(10500)	(4300)
¹⁶⁴ Ta	(-43200)	(1309800)		(8500)	(4600)	(8800)	(1200)
¹⁶⁴ W	-38210 30	1304010 30		(5000)	5278.8 21	(11400)	2940 80
¹⁶⁴ Re	(-27600)	(1292700)		(10600)	5920 50	(9600)	(0)
¹⁶⁴ Os	(-20600)	(1284800)		7090 210	6478 20	(11900)	(1700)
¹⁶⁵ Sm	(-43800)	(1327100)	(6800)		(-3700)	(3700)	
¹⁶⁵ Eu	(-50600)	(1333000)	(5900)		(-2600)	(5500)	(9700)
¹⁶⁵ Gd	(-56500)	(1338200)	(4200)		(-1900)	(4800)	(10700)
¹⁶⁵ Tb	(-60660)	(1341570)	(2960)		(-1300)	(6640)	(8200)
¹⁶⁵ Dy	-63621 3	1343754 3	1286.1 19		-530.1 16	5715.89 10	8820 100
¹⁶⁵ Ho	-64907 3	1344258 3			139.4 20	7988.8 11	6219.6 18
¹⁶⁵ Er	-64531 3	1343100 3		376.0 20	1108.4 25	6650.0 7	6830.5 23
¹⁶⁵ Tm	-62939 4	1340725 4		1592.5 15	1842 3	9020 19	4275.1 16
¹⁶⁵ Yb	-60177 20	1337180 20		2762 20	2602 22	(7250)	5480 30
¹⁶⁵ Lu	-56260 80	1332480 80		3920 80	3360 120	(9570)	(2550)
¹⁶⁵ Hf	(-51700)	(1327100)		(4600)	(3800)	(8000)	(4200)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁶⁵ Ta	(-45810)	(1320470)		(5800)	(4400)	(10600)	(1300)
¹⁶⁵ W	-38810 <i>90</i>	1312680 <i>90</i>		(7000)	5030 <i>50</i>	8670 <i>90</i>	(2900)
¹⁶⁵ Re	-30690 <i>70</i>	1303780 <i>70</i>		8120 <i>110</i>	5660 <i>50</i>	(11100)	-220 <i>80</i>
¹⁶⁵ Os	(-21900)	(1294200)		(8800)	6320 <i>50</i>	(9400)	(1600)
¹⁶⁵ Ir	(-11600)	(1283100)		(10300)	(6800)		(-1700)
¹⁶⁶ Eu	(-46600)	(1337200)	(7800)		(-2700)	(4100)	(10100)
¹⁶⁶ Gd	(-54400)	(1344200)	(3300)		(-2100)	(6000)	(11100)
¹⁶⁶ Tb	(-57700)	(1346700)	(4900)		(-1500)	(5100)	(8500)
¹⁶⁶ Dy	-62593 <i>3</i>	1350798 <i>3</i>	486.2 <i>19</i>		-728 <i>4</i>	7043.5 <i>4</i>	(9220)
¹⁶⁶ Ho	-63080 <i>3</i>	1350502 <i>3</i>	1854.9 <i>9</i>		180 <i>40</i>	6243.640 <i>20</i>	6747.4 <i>19</i>
¹⁶⁶ Er	-64934 <i>3</i>	1351574 <i>3</i>			830.9 <i>19</i>	8474.5 <i>19</i>	7316.2 <i>9</i>
¹⁶⁶ Tm	-61895 <i>11</i>	1347752 <i>11</i>		3040 <i>11</i>	1730 <i>12</i>	7027 <i>11</i>	4653 <i>11</i>
¹⁶⁶ Yb	-61591 <i>8</i>	1346666 <i>8</i>		304 <i>14</i>	2330 <i>8</i>	9485 <i>22</i>	5941 <i>8</i>
¹⁶⁶ Lu	-56110 <i>160</i>	1340400 <i>160</i>		5480 <i>160</i>	2970 <i>160</i>	7930 <i>180</i>	3220 <i>160</i>
¹⁶⁶ Hf	(-53800)	(1337300)		(2300)	(3600)	(10200)	(4800)
¹⁶⁶ Ta	(-46100)	(1328900)		(7700)	(4300)	(8400)	(1800)
¹⁶⁶ W	-41899 <i>12</i>	1323844 <i>12</i>		(4200)	4857 <i>4</i>	11160 <i>90</i>	(3370)
¹⁶⁶ Re	(-31860)	(1313020)		(10040)	5640 <i>50</i>	(9230)	(330)
¹⁶⁶ Os	(-25590)	(1305970)		6260 <i>100</i>	6131 <i>6</i>	(11700)	(2190)
¹⁶⁶ Ir	(-13500)	(1293100)		(12100)	6700 <i>50</i>	(10000)	(-1100)
¹⁶⁷ Eu	(-43700)	(1342400)	(7000)		(-2900)	(5200)	
¹⁶⁷ Gd	(-50700)	(1348500)	(5100)		(-2200)	(4400)	(11400)
¹⁶⁷ Tb	(-55800)	(1352900)	(4100)		(-1600)	(6200)	(8700)
¹⁶⁷ Dy	-59940 <i>60</i>	1356220 <i>60</i>	2350 <i>60</i>		(-900)	5420 <i>60</i>	(9500)
¹⁶⁷ Ho	-62293 <i>6</i>	1357786 <i>6</i>	1007 <i>5</i>		-113 <i>7</i>	7284 <i>5</i>	6988 <i>5</i>
¹⁶⁷ Er	-63299 <i>3</i>	1358010 <i>3</i>			665.7 <i>19</i>	6436.1 <i>4</i>	7508.6 <i>9</i>
¹⁶⁷ Tm	-62551 <i>3</i>	1356479 <i>3</i>		748.4 <i>15</i>	1411.5 <i>23</i>	8727 <i>11</i>	4905.4 <i>15</i>
¹⁶⁷ Yb	-60597 <i>5</i>	1353743 <i>5</i>		1954 <i>4</i>	2156 <i>6</i>	7077 <i>9</i>	5991 <i>12</i>
¹⁶⁷ Lu	-57470 <i>100</i>	1349830 <i>100</i>		3130 <i>100</i>	2850 <i>100</i>	9430 <i>190</i>	3160 <i>100</i>
¹⁶⁷ Hf	(-53470)	(1345050)		(4000)	(3480)	(7700)	(4600)
¹⁶⁷ Ta	(-48500)	(1339300)		(5000)	(3900)	(10400)	(2000)
¹⁶⁷ W	(-42200)	(1332200)		(6200)	4670 <i>50</i>	(8400)	(3400)
¹⁶⁷ Re	(-34870)	(1324110)		(7400)	(5260)	(11090)	(260)
¹⁶⁷ Os	(-26500)	(1314900)		(8400)	5980 <i>50</i>	(9000)	(1900)
¹⁶⁷ Ir	(-17190)	(1304860)		(9300)	6490 <i>50</i>	(11800)	-1110 <i>10</i>
¹⁶⁸ Gd	(-48100)	(1354000)	(4400)		(-2400)	(5500)	(11700)
¹⁶⁸ Tb	(-52500)	(1357600)	(6000)		(-1800)	(4700)	(9100)
¹⁶⁸ Dy	(-58500)	(1362800)	(1600)		(-1100)	(6600)	(9900)
¹⁶⁸ Ho	-60080 <i>30</i>	1363650 <i>30</i>	2910 <i>30</i>		-420 <i>100</i>	5860 <i>30</i>	7430 <i>70</i>
¹⁶⁸ Er	-62999 <i>3</i>	1365781 <i>3</i>			552.7 <i>19</i>	7771.07 <i>25</i>	7995 <i>5</i>
¹⁶⁸ Tm	-61320 <i>3</i>	1363320 <i>3</i>	257 <i>4</i>	1679.1 <i>19</i>	1245.0 <i>23</i>	6840.3 <i>18</i>	5309.6 <i>18</i>
¹⁶⁸ Yb	-61577 <i>4</i>	1362794 <i>4</i>			1951 <i>4</i>	9052 <i>5</i>	6315 <i>4</i>
¹⁶⁸ Lu	-57100 <i>80</i>	1357540 <i>80</i>		4480 <i>80</i>	2460 <i>80</i>	7710 <i>130</i>	3790 <i>80</i>
¹⁶⁸ Hf	(-55300)	(1354960)		(1800)	(3270)	(9910)	(5130)
¹⁶⁸ Ta	(-48600)	(1347500)		(6700)	(3700)	(8200)	(2500)
¹⁶⁸ W	(-44840)	(1342930)		(3800)	4506 <i>12</i>	(10700)	(3700)
¹⁶⁸ Re	(-35800)	(1333100)		(9100)	5063 <i>13</i>	(9000)	(800)
¹⁶⁸ Os	-29960 <i>30</i>	1326490 <i>30</i>		(5800)	5818 <i>3</i>	(11500)	(2380)
¹⁶⁸ Ir	(-18700)	(1314400)		(11300)	(6560)	(9500)	(-500)
¹⁶⁸ Pt	(-11100)	(1306100)		(7520)	6991 <i>20</i>		(1200)
¹⁶⁹ Gd	(-43900)	(1357900)	(6200)		(-2500)	(3900)	
¹⁶⁹ Tb	(-50100)	(1363300)	(5500)		(-2000)	(5700)	(9300)
¹⁶⁹ Dy	-55600 <i>300</i>	1368000 <i>300</i>	3200 <i>300</i>		(-1600)	(5200)	(10400)
¹⁶⁹ Ho	-58807 <i>20</i>	1370443 <i>20</i>	2124 <i>20</i>		(-570)	6790 <i>40</i>	(7600)
¹⁶⁹ Er	-60931 <i>3</i>	1371784 <i>3</i>	351.1 <i>11</i>		265.5 <i>20</i>	6003.1 <i>3</i>	8140 <i>30</i>
¹⁶⁹ Tm	-61282 <i>3</i>	1371353 <i>3</i>			1200.4 <i>13</i>	8033.4 <i>15</i>	5571.9 <i>11</i>
¹⁶⁹ Yb	-60373 <i>4</i>	1369662 <i>4</i>		909 <i>4</i>	1734 <i>4</i>	6867.2 <i>3</i>	6342 <i>4</i>
¹⁶⁹ Lu	-58080 <i>5</i>	1366586 <i>5</i>		2293 <i>3</i>	2434 <i>5</i>	9050 <i>80</i>	3792 <i>3</i>
¹⁶⁹ Hf	-54810 <i>80</i>	1362530 <i>80</i>		3270 <i>80</i>	2940 <i>80</i>	(7580)	5000 <i>110</i>
¹⁶⁹ Ta	(-50380)	(1357320)		(4440)	(3460)	(9800)	(2360)
¹⁶⁹ W	(-44900)	(1351100)		(5400)	(4300)	(8200)	(3600)
¹⁶⁹ Re	(-38350)	(1343730)		(6600)	(5040)	(10700)	(800)
¹⁶⁹ Os	-30670 <i>90</i>	1335260 <i>90</i>		(7680)	5717 <i>4</i>	8780 <i>90</i>	(2200)
¹⁶⁹ Ir	-21990 <i>90</i>	1325800 <i>90</i>		8680 <i>120</i>	6280 <i>50</i>	(11400)	-680 <i>100</i>
¹⁶⁹ Pt	(-12600)	(1315700)		(9300)	6840 <i>50</i>	(9600)	(1300)
¹⁷⁰ Tb	(-46300)	(1367600)	(7100)		(-2200)	(4300)	(9700)
¹⁷⁰ Dy	(-53400)	(1373900)	(2800)		(-1400)	(5900)	(10600)
¹⁷⁰ Ho	-56250 <i>50</i>	1375960 <i>50</i>	3870 <i>50</i>		(-1000)	5510 <i>50</i>	7900 <i>300</i>
¹⁷⁰ Er	-60118 <i>3</i>	1379043 <i>3</i>			50.2 <i>24</i>	7258.8 <i>16</i>	8600 <i>20</i>
¹⁷⁰ Tm	-59804 <i>3</i>	1377946 <i>3</i>	968.0 <i>8</i>	314.4 <i>18</i>	850.8 <i>16</i>	6593.3 <i>11</i>	6162.0 <i>14</i>

Isotope	Mass Excess	Binding Energy	Q _{β⁻}	Q _{EC}	Q _α	S _n	S _p
¹⁷⁰ Yb	-60772 3	1378132 3			1737.6 15	8470 3	6778.9 12
¹⁷⁰ Lu	-57313 19	1373891 19		3459 19	2157 22	7304 19	4229 19
¹⁷⁰ Hf	(-56220)	(1372010)		(1100)	(2950)	(9480)	(5430)
¹⁷⁰ Ta	(-50220)	(1365230)		(6000)	(3470)	(7900)	(2700)
¹⁷⁰ W	(-47200)	(1361500)		(3000)	(4100)	(10400)	(4200)
¹⁷⁰ Re	(-39000)	(1352400)		(8300)	(4700)	(8700)	(1300)
¹⁷⁰ Os	-33935 13	1346601 13		(5000)	5539 3	11340 90	(2870)
¹⁷⁰ Ir	(-23260)	(1335140)		(10680)	6170 50	(9340)	(-120)
¹⁷⁰ Pt	(-16460)	(1327560)		6790 110	6704 6	(11900)	(1760)
¹⁷¹ Tb	(-43500)	(1372800)	(6400)		(-2200)	(5200)	
¹⁷¹ Dy	(-49900)	(1378400)	(4700)		(-1600)	(4500)	(10800)
¹⁷¹ Ho	-54500 600	1382300 600	3200 600		(-1100)	6400 600	(8400)
¹⁷¹ Er	-57729 3	1384725 3	1490.5 12		-210 60	5681.5 5	8770 50
¹⁷¹ Tm	-59219 3	1385433 3	96.4 10		649 5	7486.4 14	6389.6 12
¹⁷¹ Yb	-59315 3	1384747 3			1558.9 14	6614.8 7	6800.5 10
¹⁷¹ Lu	-57837 3	1382486 3		1478.8 19	2289.4 24	8595 19	4353.6 19
¹⁷¹ Hf	(-55430)	(1379300)		(2400)	(2740)	(7300)	(5410)
¹⁷¹ Ta	(-51740)	(1374820)		(3700)	(3310)	(9600)	(2800)
¹⁷¹ W	(-47100)	(1369400)		(4700)	(4000)	(7900)	(4200)
¹⁷¹ Re	(-41400)	(1362900)		5670 200	(4600)	(10500)	(1500)
¹⁷¹ Os	(-34400)	(1355200)		(7000)	5370 5	(8600)	(2700)
¹⁷¹ Ir	(-26290)	(1346240)		(8100)	6159 3	(11100)	(-360)
¹⁷¹ Pt	(-17500)	(1336600)		(8800)	6610 50	(9100)	(1500)
¹⁷¹ Au	(-7660)	(1326050)		(9800)	(7110)		(-1510)
¹⁷² Dy	(-47400)	(1384000)	(4000)		(-1700)	(5600)	(11200)
¹⁷² Ho	(-51400)	(1387300)	(5100)		(-1300)	(4900)	(8800)
¹⁷² Er	-56493 5	1391561 5	891 5		(-400)	6836 4	9300 600
¹⁷² Tm	-57384 6	1391669 6	1880 5		280 30	6236 5	6944 5
¹⁷² Yb	-59264 3	1392767 3			1310.3 14	8019.7 3	7333.8 10
¹⁷² Lu	-56745 3	1389465 3		2519.3 24	2150 3	6979 3	4718.1 24
¹⁷² Hf	-56390 50	1388330 50		350 50	2760 50	(9030)	5850 50
¹⁷² Ta	-51470 190	1382630 190		4920 180	3200 200	(7800)	(3300)
¹⁷² W	(-49000)	(1379300)		(2500)	(3900)	(10000)	(4500)
¹⁷² Re	(-41700)	(1371200)		(7300)	(4560)	(8300)	(1900)
¹⁷² Os	(-37190)	(1366000)		(4500)	5227 10	(10800)	(3100)
¹⁷² Ir	(-27300)	(1355400)		(9800)	5991 10	(9100)	(200)
¹⁷² Pt	-21070 30	1348320 30		(6300)	6465 4	(11700)	(2080)
¹⁷² Au	(-9200)	(1335700)		(11900)	7020 50	(9600)	(-1000)
¹⁷³ Dy	(-43400)	(1388100)	(5700)		(-1900)	(4000)	
¹⁷³ Ho	(-49100)	(1393000)	(4600)		(-1400)	(5800)	(9000)
¹⁷³ Er	(-53650)	(1396790)	(2610)		(-500)	(5230)	(9500)
¹⁷³ Tm	-56262 5	1398618 5	1298 5		120 21	6950 7	7058 6
¹⁷³ Yb	-57560 3	1399134 3			945.9 14	6367.6 5	7465 6
¹⁷³ Lu	-56889 3	1397681 3		670.8 17	1967.8 20	8216.0 22	4914.4 16
¹⁷³ Hf	(-55280)	(1395290)		(1610)	(2660)	(6960)	(5830)
¹⁷³ Ta	(-52590)	(1391820)		(2690)	(3060)	(9200)	(3490)
¹⁷³ W	(-48600)	(1387000)		4000 300	(3800)	(7700)	(4400)
¹⁷³ Re	(-43700)	(1381400)		(4900)	(4200)	(10100)	(2000)
¹⁷³ Os	(-37500)	(1374300)		(6300)	5060 50	(8300)	(3100)
¹⁷³ Ir	(-30080)	(1366180)		(7400)	(5840)	(10800)	(200)
¹⁷³ Pt	-21890 100	1357210 100		(8190)	6350 50	8890 110	(1800)
¹⁷³ Au	-12670 100	1347200 100		9220 140	6900 50	(11500)	-1110 110
¹⁷⁴ Ho	(-45500)	(1397500)	(6300)		(-1600)	(4500)	(9400)
¹⁷⁴ Er	(-51800)	(1403100)	(2000)		(-900)	(6300)	(10000)
¹⁷⁴ Tm	-53870 40	1404300 40	3080 40		-50 70	5680 40	(7510)
¹⁷⁴ Yb	-56953 3	1406599 3			740.1 16	7464.60 10	7980 5
¹⁷⁴ Lu	-55579 3	1404442 3	273.3 22	1374.3 16	1800.0 20	6761.1 15	5307.9 16
¹⁷⁴ Hf	-55852 3	1403933 3			2494.8 25	(8640)	6252.0 22
¹⁷⁴ Ta	-52010 80	1399310 80		3850 80	2880 80	(7480)	(4010)
¹⁷⁴ W	(-50200)	(1396700)		(1900)	(3600)	(9600)	(4800)
¹⁷⁴ Re	(-43700)	(1389400)		(6500)	(4100)	(8000)	(2400)
¹⁷⁴ Os	(-39900)	(1384900)		(3700)	4872 10	(10600)	(3500)
¹⁷⁴ Ir	(-30900)	(1375100)		(9000)	5624 10	(8900)	(800)
¹⁷⁴ Pt	-25326 13	1368713 13		(5600)	6184 5	11510 100	(2540)
¹⁷⁴ Au	(-14050)	(1356650)		(11280)	6782 10	(9450)	(-550)
¹⁷⁵ Ho	(-42800)	(1402900)	(5700)		(-1700)	(5400)	
¹⁷⁵ Er	(-48500)	(1407800)	(3800)		(-1100)	(4700)	(10300)
¹⁷⁵ Tm	-52320 50	1410820 50	2390 50		-200 600	6520 70	(7800)
¹⁷⁵ Yb	-54704 3	1412421 3	470.0 13		599.3 16	5822.33 12	8120 40
¹⁷⁵ Lu	-55174 3	1412109 3			1619.7 17	7666.7 10	5510.0 13

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁷⁵ Hf	-54490 3	1410642 3		684.7 20	2400.9 24	6708.7 5	6199.6 22
¹⁷⁵ Ta	(-52490)	(1407860)		(2000)	(2920)	(8550)	(3930)
¹⁷⁵ W	(-49580)	(1404170)		(2910)	(3400)	(7500)	(4870)
¹⁷⁵ Re	(-45300)	(1399100)		(4300)	(4000)	(9700)	(2400)
¹⁷⁵ Os	(-40000)	(1393000)		(5300)	(4700)	(8100)	(3600)
¹⁷⁵ Ir	(-33300)	(1385500)		(6700)	5709 4	(10400)	(600)
¹⁷⁵ Pt	(-25800)	(1377300)		(7400)	6178 3	(8600)	(2200)
¹⁷⁵ Au	(-17190)	(1367860)		(8600)	(6680)	(11200)	(-850)
¹⁷⁵ Hg	(-8000)	(1357900)		(9200)	7040 50		(1200)
¹⁷⁶ Er	(-46300)	(1413700)	(3100)		(-1300)	(5900)	(10800)
¹⁷⁶ Tm	-49380 100	1415950 100	4120 100		(-400)	5130 110	(8200)
¹⁷⁶ Yb	-53497 3	1419285 3			571 4	6864.2 11	8470 50
¹⁷⁶ Lu	-53391 3	1418397 3	1192.8 9	106.2 17	1568 6	6287.98 15	5975.6 13
¹⁷⁶ Hf	-54584 3	1418807 3			2255.0 17	8165.6 18	6698.5 9
¹⁷⁶ Ta	-51470 100	1414910 100		3110 100	2850 100	(7060)	4270 100
¹⁷⁶ W	(-50680)	(1413340)		(790)	(3290)	(9200)	(5480)
¹⁷⁶ Re	(-45110)	(1406990)		(5600)	(3900)	(7900)	(2800)
¹⁷⁶ Os	(-41960)	(1403060)		(3100)	(4600)	(10100)	(4000)
¹⁷⁶ Ir	(-34000)	(1394300)		(8000)	5240 50	(8800)	(1300)
¹⁷⁶ Pt	(-28880)	(1388410)		(5100)	5886.0 22	(11100)	(2900)
¹⁷⁶ Au	(-18400)	(1377100)		(10500)	6542 10	(9300)	(-200)
¹⁷⁶ Hg	-11720 40	1369690 40		(6700)	6925 10	(11800)	(1830)
¹⁷⁷ Er	(-42500)	(1417900)	(5000)		(-1600)	(4300)	
¹⁷⁷ Tm	(-47500)	(1422100)	(3500)		(-800)	(6200)	(8500)
¹⁷⁷ Yb	-50993 3	1424852 3	1399.2 20		(240)	5566.8 12	8900 100
¹⁷⁷ Lu	-52392 3	1425469 3	498.3 8		1445 5	7072.2 6	6183.7 16
¹⁷⁷ Hf	-52890 3	1425185 3			2244.9 16	6377.7 13	6788.2 10
¹⁷⁷ Ta	-51724 4	1423237 4		1166 3	2740 3	8320 100	4429 3
¹⁷⁷ W	(-49700)	(1420500)		(2000)	(3100)	(7100)	(5500)
¹⁷⁷ Re	(-46320)	(1416270)		(3400)	(3800)	(9300)	(2900)
¹⁷⁷ Os	(-41900)	(1411000)		(4400)	(4300)	(8000)	(4100)
¹⁷⁷ Ir	(-36200)	(1404600)		(5700)	5130 50	(10300)	(1500)
¹⁷⁷ Pt	(-29400)	(1397000)		(6800)	5644 3	(8600)	(2700)
¹⁷⁷ Au	(-21220)	(1388040)		(8200)	6431 7	(10900)	(-400)
¹⁷⁷ Hg	-12730 110	1378760 110		(8500)	6740 50	9070 120	(1600)
¹⁷⁷ Tl	(-2910)	(1368160)		(9820)	(7340)		(-1530)
¹⁷⁸ Tm	(-44100)	(1426800)	(5600)		(-1000)	(4700)	(8900)
¹⁷⁸ Yb	-49701 10	1431632 10	645 10		(-300)	6780 10	(9500)
¹⁷⁸ Lu	-50346 3	1431494 3	2099.2 21		1100 40	6025.4 19	6642 3
¹⁷⁸ Hf	-52445 3	1432811 3			2083.2 16	7626.3 3	7342.3 9
¹⁷⁸ Ta	-50530 100	1430120 100		1910 100	2620 100	6880 100	4930 100
¹⁷⁸ W	-50440 100	1429240 100		91.3 20	2990 100	(8800)	6010 100
¹⁷⁸ Re	-45780 210	1423800 210		4660 180	3800 220	(7500)	(3300)
¹⁷⁸ Os	-43460 200	1420690 200		2300 300	(4300)	(9700)	(4400)
¹⁷⁸ Ir	(-36300)	(1412700)		(7200)	(5000)	(8200)	(1700)
¹⁷⁸ Pt	(-31900)	(1407600)		(4300)	5573 3	(10600)	(3100)
¹⁷⁸ Au	(-22400)	(1397300)		(9600)	6120 50	(9200)	(300)
¹⁷⁸ Hg	-16323 15	1390430 15		(6100)	6578 6	11670 110	(2390)
¹⁷⁸ Tl	(-4450)	(1377770)		(11880)	(7180)	(9600)	(-990)
¹⁷⁹ Tm	(-41600)	(1432400)	(4800)		(-1200)	(5600)	
¹⁷⁹ Yb	(-46400)	(1436400)	(2700)		(-300)	(4800)	(9600)
¹⁷⁹ Lu	-49067 6	1438287 6	1406 5		830 50	6793 5	6655 11
¹⁷⁹ Hf	-50473 3	1438910 3			1806.5 16	6099.03 10	7415.9 21
¹⁷⁹ Ta	-50362 6	1438017 6		111 5	2387 6	7900 100	5206 5
¹⁷⁹ W	-49302 16	1436175 16		1060 16	2762 16	6930 100	6060 100
¹⁷⁹ Re	-46590 50	1432680 50		2710 50	(3470)	8880 210	3440 110
¹⁷⁹ Os	(-42890)	(1428200)		(3700)	(4300)	(7500)	(4400)
¹⁷⁹ Ir	(-38100)	(1422600)		(4800)	(4800)	(9900)	(1900)
¹⁷⁹ Pt	(-32200)	(1415900)		(5900)	5395 7	(8300)	(3200)
¹⁷⁹ Au	(-24800)	(1407700)		(7400)	6082 21	(10500)	(100)
¹⁷⁹ Hg	(-17000)	(1399100)		(7800)	6431 5	(8700)	(1900)
¹⁷⁹ Tl	(-7950)	(1389350)		(9000)	(6810)	(11600)	(-1090)
¹⁸⁰ Yb	(-44400)	(1442500)	(2300)		(-500)	(6100)	(10100)
¹⁸⁰ Lu	-46690 70	1443980 70	3100 70		270 120	5690 70	(7600)
¹⁸⁰ Hf	-49790 3	1446298 3			1282.8 18	7387.90 24	8011 5
¹⁸⁰ Ta	-48935 3	1444662 3	708 4	854 3	2031 3	6645 5	5751 3
¹⁸⁰ W	-49643 5	1444587 5			2516 5	8412 15	6570 6
¹⁸⁰ Re	-45840 30	1440000 30		3800 30	3210 110	7320 60	3830 40
¹⁸⁰ Os	(-44390)	(1437760)		(1460)	(3900)	(9600)	(5080)
¹⁸⁰ Ir	(-37960)	(1430550)		(6430)	(4700)	(8000)	(2400)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁸⁰ Pt	(-34270)	(1426080)		(3690)	5275.9	(10200)	(3500)
¹⁸⁰ Au	(-25700)	(1416700)		(8600)	5851.21	(9000)	(800)
¹⁸⁰ Hg	(-20190)	(1410440)		(5500)	6258.4	(11300)	(2700)
¹⁸⁰ Tl	(-9100)	(1398600)		(11100)	(6820)	(9300)	(-500)
¹⁸¹ Yb	(-40800)	(1447000)	(3900)		(-800)	(4500)	
¹⁸¹ Lu	(-44700)	(1450100)	(2700)		(300)	(6100)	(7600)
¹⁸¹ Hf	-47414.3	1451994.3	1027.3		1153.923	5695.77	8020.70
¹⁸¹ Ta	-48441.3	1452239.3			1526.3	7577.013	5941.3
¹⁸¹ W	-48253.5	1451269.5		188.5	2212.5	6681.6	6607.5
¹⁸¹ Re	-46515.14	1448748.14		1739.15	2785.15	8740.40	4160.15
¹⁸¹ Os	-43520.200	1444980.200		2990.200	(3800)	(7200)	4970.200
¹⁸¹ Ir	-39460.210	1440120.210		4070.60	(4400)	(9600)	(2400)
¹⁸¹ Pt	(-34300)	(1434200)		(5200)	5150.50	(8100)	(3600)
¹⁸¹ Au	(-28000)	(1427100)		(6300)	5752.3	(10400)	(1000)
¹⁸¹ Hg	(-20700)	(1419000)		(7300)	6287.4	(8600)	(2200)
¹⁸¹ Tl	(-12200)	(1409700)		(8500)	(6600)	(11100)	(-700)
¹⁸¹ Pb	(-3060)	(1399820)		(9100)	(7240)		(1200)
¹⁸² Lu	(-41700)	(1455200)	(4300)		(-0)	(5100)	(8200)
¹⁸² Hf	-46060.7	1458711.7	373.7		1217.12	6717.6	(8600)
¹⁸² Ta	-46433.3	1458302.3	1813.518		1488.3	6062.9616	6308.3
¹⁸² W	-48246.3	1459333.3			1774.3	8064.5	7094.117
¹⁸² Re	-45450.100	1455750.100		2800.100	2660.140	7000.100	4480.100
¹⁸² Os	-44538.25	1454060.25		910.100	3480.100	9090.200	5310.30
¹⁸² Ir	-39000.140	1447740.140		5530.140	4350.250	7600.300	2770.250
¹⁸² Pt	-36080.200	1444040.200		2920.140	4952.5	(9900)	3900.300
¹⁸² Au	(-28300)	(1435500)		(7800)	5527.4	(8400)	(1300)
¹⁸² Hg	(-23500)	(1429900)		(4800)	5997.5	(10900)	(2800)
¹⁸² Tl	(-13400)	(1419000)		(10100)	6550.10	(9300)	(0)
¹⁸² Pb	-6822.17	1411650.17		(6600)	7076.9	(11830)	(1900)
¹⁸³ Lu	(-39500)	(1461000)	(3800)		(-300)	(5900)	
¹⁸³ Hf	-43290.30	1464010.30	2010.30		(700)	5300.30	(8900)
¹⁸³ Ta	-45296.3	1465236.3	1070.018		1347.6	6934.1820	6525.7
¹⁸³ W	-46366.3	1465524.3			1682.3	6190.710	7221.917
¹⁸³ Re	-45810.8	1464185.8		556.8	2128.9	8430.100	4852.8
¹⁸³ Os	(-43680)	(1461270)		(2130)	(3200)	(7210)	(5520)
¹⁸³ Ir	(-40230)	(1457040)		3450.100	(3940)	(9300)	(2980)
¹⁸³ Pt	(-35650)	(1451680)		(4600)	4820.50	(7600)	(3900)
¹⁸³ Au	(-30200)	(1445400)		(5500)	5466.3	(9900)	(1400)
¹⁸³ Hg	(-23700)	(1438200)		(6500)	6039.4	(8200)	(2700)
¹⁸³ Tl	(-16100)	(1429800)		(7600)	(6220)	(10800)	(-100)
¹⁸³ Pb	(-7500)	(1420400)		(8600)	7030.50	(8800)	(1400)
¹⁸⁴ Lu	(-36200)	(1465700)	(5300)			(4700)	
¹⁸⁴ Hf	-41500.40	1470290.40	1340.30		(500)	6290.50	(9300)
¹⁸⁴ Ta	-42840.30	1470850.30	2870.30		1420.80	5620.30	6840.40
¹⁸⁴ W	-45706.3	1472935.3			1659.3	7411.73	7699.418
¹⁸⁴ Re	-44223.5	1470670.5	31.4	1483.4	2287.5	6485.9	5147.4
¹⁸⁴ Os	-44255.3	1469919.3			2964.4	(8650)	5734.8
¹⁸⁴ Ir	-39700.300	1464600.300		4600.300	3700.300	(7500)	(3300)
¹⁸⁴ Pt	(-37360)	(1461460)		(2300)	4602.9	(9800)	(4420)
¹⁸⁴ Au	(-30300)	(1453620)		(7060)	5232.5	(8200)	(1900)
¹⁸⁴ Hg	(-26180)	(1448710)		(4120)	5662.5	(10600)	(3300)
¹⁸⁴ Tl	(-17000)	(1438700)		(9200)	6300.50	(8900)	(600)
¹⁸⁴ Pb	(-10990)	(1431960)		(6000)	6775.5	(11500)	(2200)
¹⁸⁵ Hf	(-38400)	(1475300)	(3000)		(0)	(5000)	(9500)
¹⁸⁵ Ta	-41396.14	1477479.14	1992.14		(900)	6630.30	7190.40
¹⁸⁵ W	-43388.3	1478689.3	433.09		1601.3	5753.73	7840.30
¹⁸⁵ Re	-43821.3	1478340.3			2194.719	7669.4	5404.49
¹⁸⁵ Os	-42809.3	1476545.3		1012.84	3020.5	6625.49	5874.4
¹⁸⁵ Ir	(-40440)	(1473390)		(2370)	(3650)	(8800)	(3470)
¹⁸⁵ Pt	-36560.210	1468730.210		(3900)	4540.50	(7300)	4200.300
¹⁸⁵ Au	-31850.210	1463240.210		4710.40	5181.4	(9600)	(1800)
¹⁸⁵ Hg	(-26100)	(1456700)		(5800)	5778.11	(8000)	(3100)
¹⁸⁵ Tl	(-19500)	(1449300)		(6600)	(6100)	(10500)	(600)
¹⁸⁵ Pb	(-11600)	(1440600)		(7900)	6680.50	(8600)	(1900)
¹⁸⁵ Bi	(-2140)	(1430400)		(9400)	(7600)		(-1570)
¹⁸⁶ Hf	(-36400)	(1481300)	(2200)			(6100)	
¹⁸⁶ Ta	-38610.60	1482760.60	3900.60		(700)	5290.60	(7500)
¹⁸⁶ W	-42511.3	1485883.3			1123.7	7194.217	8404.14
¹⁸⁶ Re	-41930.3	1484519.3	1069.59	581.617	2078.020	6179.77	5830.311

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁸⁶ Os	-42999 3	1484807 3			2822.0 17	8262.0 12	6466.8 11
¹⁸⁶ Ir	-39168 20	1480193 20		3831 20	3850 100	(6800)	3649 20
¹⁸⁶ Pt	-37790 30	1478030 30		1380 40	4325 20	9300 210	(4640)
¹⁸⁶ Au	-31670 140	1471130 140		6120 140	4906 15	7900 300	2400 250
¹⁸⁶ Hg	-28450 200	1467130 200		3230 140	5206 15	(10400)	3900 300
¹⁸⁶ Tl	(-20000)	(1457900)		(8500)	5890 50	(8600)	(1200)
¹⁸⁶ Pb	(-14600)	(1451700)		(5400)	6471 7	(11100)	(2400)
¹⁸⁶ Bi	(-3300)	(1439600)		(11300)	(7700)	(9200)	(-1000)
¹⁸⁷ Ta	(-36900)	(1489100)	(3000)		(200)	(6300)	(7800)
¹⁸⁷ W	-39907 3	1491350 3	1311.2 13		950 30	5466.72 21	8590 60
¹⁸⁷ Re	-41218 3	1491879 3	2.663 19		1652.8 23	7359.4 14	5995.5 13
¹⁸⁷ Os	-41221 3	1491099 3			2720.2 15	6292.6 13	6579.7 14
¹⁸⁷ Ir	-39718 7	1488814 7		1502 6	3667 10	8621 21	4008 6
¹⁸⁷ Pt	(-36740)	(1485050)		(2980)	(4510)	(7020)	(4860)
¹⁸⁷ Au	(-33010)	(1480540)		(3730)	4790 50	(9410)	(2510)
¹⁸⁷ Hg	(-28150)	(1474890)		(4900)	(5080)	(7800)	(3800)
¹⁸⁷ Tl	(-22200)	(1468200)		(5900)	5539 8	(10300)	(1000)
¹⁸⁷ Pb	(-14900)	(1460100)		(7300)	6395 7	(8300)	(2200)
¹⁸⁷ Bi	(-6100)	(1450500)		(8800)	(7600)	(10900)	(-1200)
¹⁸⁸ Ta	(-33800)	(1494100)	(4900)		(-100)	(5000)	
¹⁸⁸ W	-38669 4	1498184 4	349 3		410 40	6834 3	(9100)
¹⁸⁸ Re	-39018 3	1497750 3	2120.4 4		1400 30	5871.6 3	6400.4 13
¹⁸⁸ Os	-41139 3	1499088 3			2142.6 15	7989.3 3	7209.6 3
¹⁸⁸ Ir	-38329 7	1495497 7		2809 7	3469 8	6682 9	4398 7
¹⁸⁸ Pt	-37823 6	1494208 6		506 7	4007 5	(9150)	5394 8
¹⁸⁸ Au	(-32520)	(1488130)		(5300)	(4700)	(7580)	(3070)
¹⁸⁸ Hg	(-30220)	(1485040)		(2300)	4710 20	(10100)	(4500)
¹⁸⁸ Tl	(-22430)	(1476470)		(7800)	(5400)	(8300)	(1600)
¹⁸⁸ Pb	(-17640)	(1470900)		(4800)	6111 4	(10800)	(2700)
¹⁸⁸ Bi	(-7300)	(1459800)		(10400)	7275 25	(9300)	(-300)
¹⁸⁹ W	-35480 200	1503060 200	2500 200		(500)	4880 200	(9000)
¹⁸⁹ Re	-37979 9	1504782 9	1009 8		993 17	7032 8	6598 9
¹⁸⁹ Os	-38988 3	1505009 3			1975.7 16	5920.6 5	7258.6 6
¹⁸⁹ Ir	-38455 13	1503694 13		532 13	2941 13	8198 14	4606 13
¹⁸⁹ Pt	-36485 11	1500941 11		1971 14	3899 11	6734 12	5445 13
¹⁸⁹ Au	(-33640)	(1497310)		(2850)	(4400)	(9180)	(3100)
¹⁸⁹ Hg	(-29700)	(1492600)		(3950)	(4400)	(7500)	(4500)
¹⁸⁹ Tl	(-24500)	(1486600)		5180 200	(4900)	(10100)	(1600)
¹⁸⁹ Pb	(-17800)	(1479100)		(6700)	(5860)	(8200)	(2700)
¹⁸⁹ Bi	(-9800)	(1470300)		(8000)	7267 4	(10600)	(-600)
¹⁹⁰ W	-34300 220	1509960 220	1270 70		(-300)	6900 300	
¹⁹⁰ Re	-35570 210	1510440 210	3140 210		620 220	5660 210	7400 300
¹⁹⁰ Os	-38708 3	1512801 3			1378.4 16	7791.5 9	8018 8
¹⁹⁰ Ir	-36710 200	1510020 200	620 200	2000 200	2800 200	6320 200	5010 200
¹⁹⁰ Pt	-37325 6	1509853 6			3249 6	8911 10	6159 13
¹⁹⁰ Au	-32883 16	1504628 16		4442 15	3860 30	(7320)	3687 18
¹⁹⁰ Hg	(-31410)	(1502380)		(1470)	(3950)	(9800)	(5070)
¹⁹⁰ Tl	(-24400)	(1494600)		7000 400	(4800)	(8000)	(2000)
¹⁹⁰ Pb	-20330 200	1489720 200		(4100)	5698 5	(10600)	(3100)
¹⁹⁰ Bi	(-10700)	(1479300)		(9600)	6862 5	(9000)	(200)
¹⁹⁰ Po	(-4600)	(1472400)		(6100)	7643 20		(2100)
¹⁹¹ Re	-34350 11	1517296 11	2045 10		(100)	6850 210	7340 220
¹⁹¹ Os	-36395 3	1518559 3	313.7 11		1086.4 16	5758.66 16	8120 210
¹⁹¹ Ir	-36709 3	1518091 3			2083.9 15	8070 200	5290.0 11
¹⁹¹ Pt	-35691 5	1516290 5		1019 4	3105 4	6437 6	6270 200
¹⁹¹ Au	-33860 50	1513680 50		1830 50	3430 50	9050 50	3820 50
¹⁹¹ Hg	-30680 90	1509710 90		3180 70	(3640)	(7340)	5090 90
¹⁹¹ Tl	(-26190)	(1504440)		(4490)	(4400)	(9800)	(2100)
¹⁹¹ Pb	(-20310)	(1497780)		(5900)	(5410)	(8100)	(3200)
¹⁹¹ Bi	(-13000)	(1489700)		(7300)	6781 5	(10400)	(-0)
¹⁹¹ Po	(-5000)	(1480900)		(8000)	7471 20	(8500)	(1600)
¹⁹² Re	(-31710)	(1522730)	(4170)		(-300)	(5430)	
¹⁹² Os	-35882 3	1526117 4			362 4	7558.0 21	8821 10
¹⁹² Ir	-34836 3	1524289 3	1459.7 19	1046.2 23	1757.4 16	6198.08 20	5729.4 12
¹⁹² Pt	-36296 3	1524966 3			2418.1 24	8676 3	6875.4 19
¹⁹² Au	-32779 16	1520667 16		3516 16	3125 17	6990 50	4378 16
¹⁹² Hg	(-32100)	(1519200)		(700)	(3300)	(9500)	(5500)
¹⁹² Tl	(-25950)	(1512270)		(6120)	(4150)	(7800)	(2560)
¹⁹² Pb	(-22580)	(1508120)		(3400)	5221 5	(10300)	(3700)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁹² Bi	(-13630)	(1498390)		(8900)	6376.5	(8700)	(600)
¹⁹² Po	(-7900)	(1491870)		(5700)	7320.7	(11000)	(2200)
¹⁹³ Os	-33396.4	1531702.4	1140.524		-340.200	5585.19	(8980)
¹⁹³ Ir	-34536.3	1532060.3			1017.8	7771.8520	5943.323
¹⁹³ Pt	-34480.3	1531222.3		56.63	2083.215	6255.519	6932.94
¹⁹³ Au	-33411.9	1529371.9		1069.9	2619.16	8703.18	4405.9
¹⁹³ Hg	-31071.19	1526248.19		2340.17	2989.22	(7100)	5581.25
¹⁹³ Tl	(-27430)	(1521830)		(3640)	(3800)	(9600)	(2700)
¹⁹³ Pb	(-22280)	(1515890)		(5200)	(5000)	(7800)	(3600)
¹⁹³ Bi	(-15800)	(1508600)		(6500)	6305.5	(10200)	(500)
¹⁹³ Po	(-8300)	(1500300)		(7500)	7100.50	(8500)	(1900)
¹⁹³ At	(200)	(1491100)		(8500)	7530.30		(-800)
¹⁹⁴ Os	-32435.4	1538813.4	96.620		-560.220	7111.3	
¹⁹⁴ Ir	-32532.3	1538127.3	2246.816		610.210	6066.84	6425.024
¹⁹⁴ Pt	-34779.3	1539592.3			1504.519	8370.316	7531.316
¹⁹⁴ Au	-32287.12	1536317.12		2492.11	2000.200	6947.14	5096.11
¹⁹⁴ Hg	-32247.23	1535495.23		40.20	2653.24	9250.30	6125.25
¹⁹⁴ Tl	(-26960)	(1529430)		(5280)	(3490)	(7600)	(3180)
¹⁹⁴ Pb	(-24250)	(1525930)		(2700)	4738.20	(10040)	(4100)
¹⁹⁴ Bi	(-16100)	(1517000)		8200.400	5918.5	(8400)	(1100)
¹⁹⁴ Po	-10910.200	1511030.200		(5200)	6987.3	(10700)	(2400)
¹⁹⁴ At	(-1000)	(1500300)		(10000)	(7310)	(9200)	(-0)
¹⁹⁵ Os	-29700.500	1544100.500	2000.500			5300.500	
¹⁹⁵ Ir	-31692.3	1545359.3	1120.016		233.10	7231.8711	6546.120
¹⁹⁵ Pt	-32812.3	1545697.3			1158.119	6105.0612	7569.516
¹⁹⁵ Au	-32586.3	1544688.3		226.810	1698.619	8370.11	5095.910
¹⁹⁵ Hg	-31080.50	1542400.50		1510.50	2190.50	6900.60	6080.50
¹⁹⁵ Tl	(-28270)	(1538810)		(2810)	(3170)	(9380)	(3310)
¹⁹⁵ Pb	(-23800)	(1533500)		(4500)	(4500)	(7600)	(4100)
¹⁹⁵ Bi	(-17930)	(1526900)		(5900)	5833.5	(9900)	(1000)
¹⁹⁵ Po	(-11140)	(1519330)		(6800)	6750.50	(8300)	(2400)
¹⁹⁵ At	(-3200)	(1510600)		(7900)	7360.50	(10300)	(-400)
¹⁹⁶ Os	-28300.40	1550820.40	1160.60			6700.500	
¹⁹⁶ Ir	-29450.40	1551190.40	3210.40		(-170)	5830.40	7100.500
¹⁹⁶ Pt	-32663.3	1553619.3			794.3	7921.8815	8259.516
¹⁹⁶ Au	-31157.4	1551331.4	686.3	1506.3	1254.3	6643.3	5634.3
¹⁹⁶ Hg	-31843.4	1551234.4			2027.4	8840.50	6547.3
¹⁹⁶ Tl	(-27470)	(1546070)		(4380)	(2890)	(7270)	(3680)
¹⁹⁶ Pb	(-25420)	(1543250)		(2050)	(4200)	(9700)	(4440)
¹⁹⁶ Bi	(-18060)	(1535110)		(7360)	5460.50	(8200)	(1600)
¹⁹⁶ Po	(-13500)	(1529760)		(4600)	6657.3	(10400)	(2900)
¹⁹⁶ At	(-4000)	(1519480)		(9500)	7200.50	(8900)	(200)
¹⁹⁶ Rn	(2150)	(1512550)		(6200)	7620.30		(1900)
¹⁹⁷ Ir	-28283.20	1558093.20	2155.20			6900.40	7280.40
¹⁹⁷ Pt	-30438.3	1559465.3	718.96		533.3	5846.43	8270.40
¹⁹⁷ Au	-31157.3	1559402.3			954.517	8071.3	5783.07
¹⁹⁷ Hg	-30557.4	1558020.4		600.3	1497.4	6785.415	6689.3
¹⁹⁷ Tl	-28380.30	1555060.30		2180.30	2610.30	(8980)	3820.30
¹⁹⁷ Pb	(-24800)	(1550690)		(3580)	(3850)	(7450)	(4620)
¹⁹⁷ Bi	-19620.240	1544740.240		(5200)	(5390)	(9600)	(1500)
¹⁹⁷ Po	(-13450)	(1537780)		(6200)	6410.50	(8000)	(2700)
¹⁹⁷ At	(-6300)	(1529800)		(7200)	7100.50	(10300)	(0)
¹⁹⁷ Rn	(1500)	(1521200)		(7800)	7410.50	(8700)	(1700)
¹⁹⁸ Ir	(-25820)	(1563700)	(4100)			(5610)	
¹⁹⁸ Pt	-29923.4	1567022.4			87.4	7557.3	8929.20
¹⁹⁸ Au	-29598.3	1565914.3	1372.55	325.3	509.017	6512.3411	6448.96
¹⁹⁸ Hg	-30970.3	1566504.3			1383.39	8484.3	7102.55
¹⁹⁸ Tl	-27510.80	1562260.80		3460.80	2350.80	7200.90	4240.80
¹⁹⁸ Pb	(-26100)	(1560070)		(1410)	(3720)	(9380)	(5010)
¹⁹⁸ Bi	-19540.180	1552730.180		(6560)	(5000)	7990.230	(2030)
¹⁹⁸ Po	(-15520)	(1547920)		(4020)	6309.120	(10140)	(3200)
¹⁹⁸ At	(-6800)	(1538400)		8800.400	6893.3	(8600)	(600)
¹⁹⁸ Rn	-1140.200	1531980.200		(5600)	7352.5	(10800)	(2200)
¹⁹⁹ Ir	-24420.40	1570370.40	2990.40			(6670)	
¹⁹⁹ Pt	-27408.4	1572578.4	1703.3		-100.500	5556.15	(8880)
¹⁹⁹ Au	-29111.3	1573498.3	452.37		156.517	7584.3615	6477.3
¹⁹⁹ Hg	-29563.3	1573168.3			824.210	6664.16	7254.37
¹⁹⁹ Tl	-28120.100	1570940.100		1450.100	2040.100	8680.130	4440.100
¹⁹⁹ Pb	-25230.70	1567280.70		2880.90	3420.80	(7210)	5010.100

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
¹⁹⁹ Bi	-20890 120	1562140 120		4350 120	(4960)	9420 160	(2080)
¹⁹⁹ Po	(-15300)	(1555800)		(5600)	6074.3 20	(7800)	(3000)
¹⁹⁹ At	(-8730)	(1548420)		(6600)	6780 50	(10000)	(500)
¹⁹⁹ Rn	(-1580)	(1540490)		(7200)	7140 50	(8500)	(2100)
²⁰⁰ Pt	-26618 20	1579860 20	660 60		-750 40	7282 20	9490 50
²⁰⁰ Au	-27280 50	1579730 50	2240 50		-250 60	6240 50	7160 50
²⁰⁰ Hg	-29520 3	1581197 3			717.8 10	8028.25 25	7698.2 7
²⁰⁰ Tl	-27064 6	1577958 6		2456 6	1668 6	7020 100	4790 6
²⁰⁰ Pb	-26254 13	1576365 13		811 14	3165 13	9090 70	5420 100
²⁰⁰ Bi	-20360 90	1569690 90		5890 90	(4680)	7550 120	2410 110
²⁰⁰ Po	(-17010)	(1565560)		(3350)	5981.5 20	(9800)	(3420)
²⁰⁰ At	(-9040)	(1556810)		(7970)	6596.4 14	(8400)	(1100)
²⁰⁰ Rn	(-4030)	(1551010)		(5000)	7043 3	(10500)	(2600)
²⁰⁰ Fr	(6050)	(1540150)		(10100)	7630 50		(-300)
²⁰¹ Pt	-23760 50	1585070 50	2660 50			5210 50	
²⁰¹ Au	-26416 4	1586946 4	1263 3		-558 20	7210 50	7087 20
²⁰¹ Hg	-27679 3	1587427 3			334.1 11	6230.2 6	7690 50
²⁰¹ Tl	-27196 15	1586161 15		483 15	1536 15	8203 16	4965 15
²⁰¹ Pb	-25290 30	1583480 30		1900 30	2840 30	7110 30	5520 30
²⁰¹ Bi	-21450 30	1578850 30		3840 40	4500 6	9160 90	2490 30
²⁰¹ Po	(-16570)	(1573190)		(4880)	5799.0 17	(7630)	(3500)
²⁰¹ At	-10720 240	1566560 240		(5800)	6473.3 16	(9800)	(1000)
²⁰¹ Rn	(-4160)	(1559210)		(6600)	6860 50	(8200)	(2400)
²⁰¹ Fr	(3700)	(1550600)		(7900)	7540 50	(10400)	(-500)
²⁰² Pt	(-22600)	(1592000)	(1800)			(6900)	
²⁰² Au	-24420 170	1593020 170	2950 170		(-1000)	6070 170	7950 170
²⁰² Hg	-27362 3	1595181 3			136 3	7754.31 23	8235 3
²⁰² Tl	-25997 15	1593034 15		1365 15	1176 15	6873 21	5607 15
²⁰² Pb	-25948 10	1592202 10		50 15	2598 10	8730 30	6041 18
²⁰² Bi	-20800 50	1586270 50		5150 50	4290 100	7420 60	2790 60
²⁰² Po	(-17980)	(1582660)		(2820)	5701.0 17	(9470)	(3810)
²⁰² At	-10760 180	1574670 180		(7210)	6353.7 14	8110 230	(1480)
²⁰² Rn	(-6320)	(1569440)		(4440)	6773.6 19	(10230)	(2900)
²⁰² Fr	(3100)	(1559300)		9400 400	7389 9	(8700)	(100)
²⁰³ Au	-23159 4	1599832 4	2124 4		-1170 40	6810 170	(7900)
²⁰³ Hg	-25283 3	1601174 3	491.8 12		-300 4	5992.7 17	8160 170
²⁰³ Tl	-25775 3	1600883 3			910.8 15	7849 15	5702.2 12
²⁰³ Pb	-24801 7	1599126 7		975 6	2338 6	6924 11	6092 16
²⁰³ Bi	-21547 21	1595090 21		3253 22	4150 100	8820 60	2888 23
²⁰³ Po	-17310 70	1590070 70		4230 60	5496 5	(7410)	3810 80
²⁰³ At	-12250 120	1584230 120		5060 120	6210.3 8	9560 160	(1570)
²⁰³ Rn	(-6200)	(1577400)		(6000)	6629.9 23	(8000)	(2800)
²⁰³ Fr	(980)	(1569440)		(7200)	7280 50	(10200)	(-0)
²⁰³ Ra	(8580)	(1561050)		(7600)	7730 50		(1800)
²⁰⁴ Au	(-20770)	(1605510)	(3940)			(5680)	
²⁰⁴ Hg	-24707 3	1608669 3			-514 20	7495.1 18	8837 3
²⁰⁴ Tl	-24360 3	1607539 3	763.72 18	347.5 15	490 50	6655.9 3	6365.4 13
²⁰⁴ Pb	-25124 3	1607520 3			1971.8 13	8394 6	6637.2 3
²⁰⁴ Bi	-20670 30	1602290 30		4450 30	3960 30	7200 30	3160 30
²⁰⁴ Po	-18344 13	1599176 13		2330 30	5484.9 14	9100 70	4086 25
²⁰⁴ At	-11870 90	1591920 90		6480 90	6069.9 15	7690 120	1840 110
²⁰⁴ Rn	(-8040)	(1587310)		(3820)	6545.6 19	(9900)	(3080)
²⁰⁴ Fr	(550)	(1577930)		(8600)	7170 3	(8500)	(500)
²⁰⁴ Ra	(6030)	(1571670)		(5500)	7636 8	(10600)	(2200)
²⁰⁵ Au	(-19000)	(1611800)	(3300)			(6300)	
²⁰⁵ Hg	-22304 5	1614337 5	1531 4		-970 50	5668 4	(8830)
²⁰⁵ Tl	-23835 3	1615085 3			157 3	7546.3 5	6416.5 15
²⁰⁵ Pb	-23784 3	1614252 3		51.1 5	1470.4 12	6731.51 15	6712.87 23
²⁰⁵ Bi	-21075 8	1610761 8		2708 7	3696 17	8470 30	3241 7
²⁰⁵ Po	-17540 30	1606450 30		3530 30	5324 10	7270 30	4160 40
²⁰⁵ At	-13010 30	1601130 30		4540 40	6019.7 17	9210 90	1950 30
²⁰⁵ Rn	(-7760)	(1595100)		(5250)	6390 50	(7790)	(3180)
²⁰⁵ Fr	-1240 240	1587800 240		(6500)	7050 50	(9900)	(500)
²⁰⁵ Ra	(5760)	(1580010)		(7000)	7500 50	(8300)	(2100)
²⁰⁶ Hg	-20960 21	1621064 21	1307 20		(-800)	6728 21	(9300)
²⁰⁶ Tl	-22267 3	1621589 3	1533.5 7		-280 170	6503.6 4	7252 4
²⁰⁶ Pb	-23801 3	1622340 3			1136.6 12	8088.2 4	7254.8 6
²⁰⁶ Bi	-20043 8	1617800 8		3758 8	3529 17	7039 10	3548 8
²⁰⁶ Po	-18197 10	1615171 10		1847 12	5326.5 13	8720 30	4410 12

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²⁰⁶ At	-12480 50	1608680 50		5710 50	5888.4 19	7550 60	2230 60
²⁰⁶ Rn	(-9170)	(1604580)		(3320)	6383.8 16	(9480)	(3450)
²⁰⁶ Fr	-1410 180	1596040 180		(7760)	6926 4	8240 220	(940)
²⁰⁶ Ra	(3520)	(1590320)		(4930)	7416 5	(10300)	(2500)
²⁰⁷ Hg	-16230 150	1624410 150	4820 150			3340 150	
²⁰⁷ Tl	-21044 6	1628438 6	1423 5		-310 6	6849 6	7374 21
²⁰⁷ Pb	-22467 3	1629078 3			391.5 13	6737.79 11	7489.0 7
²⁰⁷ Bi	-20069 4	1625897 4		2398.2 21	3281.5 22	8097 8	3557.2 21
²⁰⁷ Po	-17160 7	1622206 7		2909 6	5215.9 10	7035 11	4406 10
²⁰⁷ At	-13250 21	1617514 21		3910 22	5873 3	8840 60	2342 23
²⁰⁷ Rn	-8640 70	1612120 70		4610 60	6251.0 16	(7540)	3440 80
²⁰⁷ Fr	-2930 120	1605620 120		5710 120	6900 50	9590 150	(1050)
²⁰⁷ Ra	(3500)	(1598400)		(6400)	7270 50	(8100)	(2400)
²⁰⁷ Ac	(11270)	(1589870)		(7800)	7860 50		(-500)
²⁰⁸ Hg	(-13100)	(1629300)	(3700)			(4900)	
²⁰⁸ Tl	-16763 3	1632227 3	5001.0 17		(1580)	3789 6	7820 150
²⁰⁸ Pb	-21764 3	1636446 3			518.8 15	7367.82 9	8008 5
²⁰⁸ Bi	-18884 4	1632784 4		2879.1 20	3050.5 20	6887 3	3706.4 20
²⁰⁸ Po	-17483 3	1630601 3		1401.3 24	5215.5 13	8395 6	4703 3
²⁰⁸ At	-12500 30	1624830 30		4980 30	5751.1 22	7320 30	2630 30
²⁰⁸ Rn	-9658 13	1621211 14		2840 30	6260.5 17	9090 70	3698 25
²⁰⁸ Fr	-2670 80	1613440 80		6990 80	6770 50	7820 100	1320 100
²⁰⁸ Ra	(1650)	(1608330)		(4320)	7273 5	(9900)	(2710)
²⁰⁸ Ac	(10700)	(1598510)		(9040)	7721 15	(8600)	(100)
²⁰⁹ Tl	-13647 10	1637183 10	3982 10		(2900)	4956 10	(7800)
²⁰⁹ Pb	-17629 3	1640382 3	644.2 11		2250 4	3936.5 13	8155.1 22
²⁰⁹ Bi	-18273 3	1640244 3			3137.0 8	7459.8 19	3798.3 8
²⁰⁹ Po	-16380 3	1637568 3		1893.3 16	4979.2 14	6967.8 19	4784.1 24
²⁰⁹ At	-12893 8	1633300 8		3486 7	5757.3 20	8470 30	2699 7
²⁰⁹ Rn	-8960 30	1628590 30		3930 30	6155.3 20	7380 30	3750 40
²⁰⁹ Fr	-3800 30	1622650 30		5160 40	6777 4	9210 80	1440 30
²⁰⁹ Ra	(1810)	(1616250)		(5620)	7150 50	(7920)	(2810)
²⁰⁹ Ac	8910 240	1608360 240		(7100)	7730 50	(9900)	(0)
²¹⁰ Tl	-9254 11	1640861 11	5489 11			3678 15	
²¹⁰ Pb	-14743 3	1645568 3	63.5 5		3792 20	5185.3 12	8384 10
²¹⁰ Bi	-14806 3	1644849 3	1162.1 8		5036.0 8	4604.58 13	4466.4 11
²¹⁰ Po	-15968 3	1645228 3			5407.46 7	7660.0 14	4984.3 8
²¹⁰ At	-11987 8	1640465 8		3981 8	5631.1 10	7165 11	2896 8
²¹⁰ Rn	-9613 10	1637309 10		2374 12	6158.5 22	8720 30	4009 12
²¹⁰ Fr	-3355 22	1630268 22		6258 24	6700 50	7620 40	1680 40
²¹⁰ Ra	(420)	(1625720)		(3770)	7157 5	(9470)	(3070)
²¹⁰ Ac	8620 190	1616730 190		(8210)	7610 50	8360 240	(480)
²¹⁰ Th	(14000)	(1610570)		(5380)	8053 17		(2200)
²¹¹ Pb	-10497 3	1649393 3	1372 6		3310 150	3825 3	8532 12
²¹¹ Bi	-11869 6	1649983 6	579 6		6750.5 5	5134 6	4415 6
²¹¹ Po	-12448 3	1649779 3			7594.5 5	4550.8 5	4930.5 9
²¹¹ At	-11662 4	1648211 4		786 3	5982.4 13	7746 8	2982.3 25
²¹¹ Rn	-8770 7	1644536 7		2892 7	5965.2 14	7228 12	4071 10
²¹¹ Fr	-4164 21	1639149 21		4605 21	6660 5	8880 30	1840 23
²¹¹ Ra	830 70	1633370 70		5000 60	7046 5	(7650)	3100 70
²¹¹ Ac	7120 130	1626300 130		6290 130	7620 50	9570 160	(580)
²¹¹ Th	(13800)	(1618800)		(6700)	7940 50	(8200)	(2100)
²¹² Pb	-7557 3	1654524 3	573.8 20		(3100)	5132 3	
²¹² Bi	-8131 3	1654316 3	2254.0 17		6207.14 4	4333 6	4923 3
²¹² Po	-10385 3	1655787 3			8954.13 11	6008.2 5	5805 5
²¹² At	-8631 4	1653251 4	43 4	1754 3	7828.9 20	5040 4	3472 3
²¹² Rn	-8673 4	1652511 4			6385 3	7975 7	4301 4
²¹² Fr	-3540 30	1646600 30		5130 30	6529.0 17	7450 30	2060 30
²¹² Ra	-202 14	1642475 14		3340 30	7031.9 18	9110 70	3326 25
²¹² Ac	7280 90	1634210 90		7480 90	7520 50	7920 120	850 110
²¹² Th	(12030)	(1628680)		(4760)	7952 10	(9900)	(2380)
²¹³ Pb	(-3260)	(1658300)	(1980)			(3770)	
²¹³ Bi	-5240 8	1659496 8	1427 7		5982 6	5181 7	4972 7
²¹³ Po	-6667 4	1660141 4			8537 3	4354 3	5826 3
²¹³ At	-6594 6	1659286 6		73 5	9254 5	6035 5	3498 5
²¹³ Rn	-5712 7	1657621 7		882 8	8243 6	5110 7	4370 7
²¹³ Fr	-3563 8	1654690 8		2148 10	6905.1 18	8090 30	2179 8
²¹³ Ra	320 30	1650020 30		3890 30	6861 4	7550 30	3420 40
²¹³ Ac	6120 60	1643440 60		5800 70	7500 50	9220 100	960 60

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²¹³ Th	(12070)	(1636710)		(5950)	7840 50	(8030)	(2490)
²¹³ Pa	19730 250	1628270 250		(7700)	8390 50		(-400)
²¹⁴ Pb	-188 3	1663298 3	1024 11			(5000)	
²¹⁴ Bi	-1212 11	1663540 11	3272 11		5616.8 9	4044 13	(5240)
²¹⁴ Po	-4484 3	1666030 3			7833.46 6	5888 3	6533 7
²¹⁴ At	-3394 5	1664157 5	941 10	1090 4	8987 4	4871 6	4016 5
²¹⁴ Rn	-4335 10	1664316 10			9208 9	6695 11	5030 10
²¹⁴ Fr	-974 9	1660172 9		3361 13	8589 4	5482 12	2551 11
²¹⁴ Ra	85 11	1658331 11		1059 14	7273 4	8310 30	3641 13
²¹⁴ Ac	6420 50	1651210 50		6340 60	7350 50	7770 80	1190 60
²¹⁴ Th	(10670)	(1646190)		(4250)	7826 7	(9480)	(2750)
²¹⁴ Pa	19320 190	1636750 190		(8650)	8270 50	8480 250	(40)
²¹⁵ Bi	1710 100	1668690 100	2250 100			5150 100	5390 100
²¹⁵ Po	-545 3	1670162 3	720 7		7526.4 8	4132 3	6622 11
²¹⁵ At	-1266 7	1670100 7			8178 4	5943 8	4070 7
²¹⁵ Rn	-1184 8	1669236 8		82 10	8839 8	4920 12	5079 9
²¹⁵ Fr	304 8	1666966 8		1487 10	9540 7	6794 11	2650 11
²¹⁵ Ra	2519 8	1663968 8		2215 10	8864 4	5637 13	3796 11
²¹⁵ Ac	6010 50	1659700 50		3490 50	7750 50	8480 80	1360 60
²¹⁵ Th	10920 70	1654000 70		4910 80	7666 6	(7820)	2790 90
²¹⁵ Pa	17790 140	1646350 140		6870 140	8240 50	9600 180	(170)
²¹⁶ Bi	(5780)	(1672700)	(4000)			(4000)	
²¹⁶ Po	1775 3	1675913 3			6906.5 5	5751.4 25	7220 100
²¹⁶ At	2244 4	1674662 4	2003 8	469 4	7949 3	4562 8	4500 4
²¹⁶ Rn	240 8	1675883 8			8200 7	6647 10	5783 10
²¹⁶ Fr	2969 13	1672372 13		2729 14	9175 12	5406 14	3136 15
²¹⁶ Ra	3277 9	1671281 9		308 15	9526 8	7313 11	4315 11
²¹⁶ Ac	8120 30	1665650 30		4850 30	9243 8	5960 60	1680 30
²¹⁶ Th	10294 16	1662700 16		2170 30	8071 8	8700 70	3000 60
²¹⁶ Pa	17800 110	1654410 110		7510 110	8100 50	8060 140	410 120
²¹⁷ Po	(5830)	(1679930)	(1440)		6660 4	(4020)	(7240)
²¹⁷ At	4387 8	1680590 8	741 8		7201.9 14	5928 8	4677 7
²¹⁷ Rn	3646 5	1680548 5			7889 3	4665 8	5886 5
²¹⁷ Fr	4300 7	1679112 7		654 8	8469 4	6741 14	3229 10
²¹⁷ Ra	5874 10	1676756 10		1574 11	9161 6	5475 13	4384 16
²¹⁷ Ac	8693 13	1673154 13		2819 16	9832 10	7500 30	1873 15
²¹⁷ Th	12170 30	1668890 30		3480 30	9424 9	6190 30	3240 40
²¹⁷ Pa	17040 80	1663250 80		4860 80	8490 50	8840 130	550 80
²¹⁸ Po	8352 3	1685479 3	265 12		6114.68 9	(5550)	
²¹⁸ At	8087 12	1684962 12	2883 12		6874 3	4372 14	(5030)
²¹⁸ Rn	5204 3	1687062 3			7263.0 18	6514 4	6472 8
²¹⁸ Fr	7045 5	1684438 5	409 12	1842 5	8014.3 20	5326 8	3890 6
²¹⁸ Ra	6636 11	1684065 11			8546 6	7309 14	4953 13
²¹⁸ Ac	10830 50	1679090 50		4190 50	9380 50	5940 50	2330 50
²¹⁸ Th	12359 14	1676778 14		1530 50	9849 9	7880 30	3623 19
²¹⁸ Pa	18640 70	1669720 70		6280 80	9790 50	6470 110	820 80
²¹⁸ U	(21880)	(1665690)		(3240)	8786.25		(2450)
²¹⁹ At	10520 80	1690600 80	1700 80		6390 50	5640 80	5120 80
²¹⁹ Rn	8826 3	1691512 3	218 7		6946.1 3	4449 4	6550 12
²¹⁹ Fr	8608 7	1690947 7			7448.5 18	6509 8	3885 7
²¹⁹ Ra	9379 9	1689394 9		771 11	8138 3	5328 14	4955 9
²¹⁹ Ac	11560 50	1686440 50		2180 50	8830 50	7340 70	2370 50
²¹⁹ Th	14460 50	1682750 50		2900 70	9510 50	5970 50	3660 70
²¹⁹ Pa	18520 70	1677910 70		4060 90	10080 50	8190 100	1130 70
²¹⁹ U	23210 80	1672430 80		4690 110	9860 50	(6740)	2720 110
²²⁰ At	(14250)	(1694940)	(3650)		6050 50	(4340)	
²²⁰ Rn	10604 3	1697804 3			6404.67 10	6292.8 25	7210 80
²²⁰ Fr	11469 5	1696157 5	1209 11	865 4	6800.7 19	5210 8	4645 5
²²⁰ Ra	10260 10	1696584 10			7595 7	7190 13	5637 12
²²⁰ Ac	13740 50	1692320 50		3480 50	8350 50	5880 70	2930 50
²²⁰ Th	14655 22	1690624 22		910 60	8953 20	7870 60	4190 60
²²⁰ Pa	20380 60	1684120 60		5720 60	9830 50	6210 90	1370 80
²²⁰ U	(23020)	(1680700)		(2640)	(10300)	(8260)	(2790)
²²¹ At	(16900)	(1700400)	(2500)			(5400)	
²²¹ Rn	(14400)	(1702080)	(1130)		6146 3	(4280)	(7150)
²²¹ Fr	13270 8	1702428 8	315 9		6457.9 14	6271 8	4623 7
²²¹ Ra	12955 7	1701960 7			6884 5	5376 12	5803 8
²²¹ Ac	14510 50	1699620 50		1550 50	7780 50	7300 70	3040 50
²²¹ Th	16927 10	1696424 10		2420 50	8628 4	5800 24	4100 50

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²²¹ Pa	20370.50	1692200.50		3440.50	9250.50	8080.80	1580.60
²²¹ U	(24550)	(1687240)		(4180)	(9950)	(6540)	(3120)
²²² At	(20800)	(1704500)	(4400)			(4200)	
²²² Rn	16367.3	1708185.3	25.21		5590.3.3	(6100)	(7800)
²²² Fr	16342.21	1707427.21	2033.21		5830.24	4999.22	(5340)
²²² Ra	14309.5	1708677.5			6681.4	6717.8	6249.8
²²² Ac	16607.6	1705597.6		2298.7	7137.4.20	5970.50	3637.8
²²² Th	17190.13	1704232.13		582.14	8129.6	7808.16	4610.50
²²² Pa	(22100)	(1698540)		(4910)	(8850)	(6340)	(2120)
²²² U	(24280)	(1695570)		(2180)	(9500)	(8330)	(3370)
²²³ At	(23600)	(1709800)	(3300)			(5300)	
²²³ Rn	(20300)	(1712300)	(1900)			(4100)	(7800)
²²³ Fr	18379.3	1713461.3	1149.1.9		5430.80	6034.21	5276.7.24
²²³ Ra	17230.3	1713828.3			5979.3.3	5151.5	6401.21
²²³ Ac	17816.7	1712460.7		586.7	6783.1.9	6863.9	3783.8
²²³ Th	19371.10	1710123.10		1555.12	7567.4	5891.16	4526.10
²²³ Pa	22320.70	1706390.70		2950.70	8340.50	(7850)	2160.70
²²³ U	25820.70	1702100.70		3500.100	8940.50	(6530)	(3570)
²²⁴ Rn	(22400)	(1718300)	(800)			(5900)	(8500)
²²⁴ Fr	21640.50	1718270.50	2830.50		(4970)	4810.50	(5900)
²²⁴ Ra	18818.3	1720311.3			5788.87.15	6483.3.25	6850.0.23
²²⁴ Ac	20221.5	1718126.5	232.13	1403.4	6326.9.7	5666.8	4298.5
²²⁴ Th	19989.12	1717575.12			7304.7	7453.15	5116.14
²²⁴ Pa	23860.50	1712920.50		3870.50	7694.4	6530.90	2800.50
²²⁴ U	25700.25	1710300.25		1840.60	8620.12	8200.80	3910.80
²²⁵ Rn	(26500)	(1722300)	(2600)			(4000)	
²²⁵ Fr	23853.10	1724130.10	1865.10		(4500)	5860.50	(5900)
²²⁵ Ra	21987.3	1725213.3	358.7		(5170)	4902.3	6950.50
²²⁵ Ac	21630.8	1724788.8			5935.2.14	6663.8	4477.7
²²⁵ Th	22301.7	1723335.7		671.10	6921.4.21	5759.14	5209.8
²²⁵ Pa	24330.70	1720530.70		2020.70	7390.50	7610.90	2950.70
²²⁵ U	27370.50	1716700.50		3050.90	8020.50	6400.60	3780.70
²²⁵ Np	31580.70	1711710.70		4210.90	8790.50		1410.80
²²⁶ Rn	(28800)	(1728100)	(1400)			(5800)	
²²⁶ Fr	27330.90	1728720.90	3670.90		(4100)	4590.90	(6400)
²²⁶ Ra	23662.3.25	1731610.3			4870.63.25	6396.3	7479.10
²²⁶ Ac	24303.4	1730187.4	1117.5	640.3	5536.21	5399.8	4974.4
²²⁶ Th	23186.5	1730522.5			6451.2.10	7187.8	5733.8
²²⁶ Pa	26019.12	1726906.12		2834.12	6987.10	6380.70	3571.13
²²⁶ U	27330.19	1724813.19		1311.22	7715.14	8110.50	4290.70
²²⁶ Np	(32720)	(1718640)		(5390)	8200.50	(6930)	(1940)
²²⁷ Rn	(33000)	(1731900)	(3300)			(3900)	
²²⁷ Fr	29650.100	1734470.100	2480.100		(3600)	5750.130	(6400)
²²⁷ Ra	27172.3	1736171.3	1326.2.24		(4500)	4561.3.3	7450.90
²²⁷ Ac	25846.3	1736715.3	44.8.8		5042.19.14	6528.3	5105.1.24
²²⁷ Th	25801.3	1735977.3			6146.43.15	5456.5	5790.4
²²⁷ Pa	26821.8	1734176.8		1019.8	6580.0.21	7270.14	3654.9
²²⁷ U	29007.17	1731207.17		2186.18	7211.14	6394.25	4301.20
²²⁷ Np	32560.70	1726870.70		3560.70	7816.14	(8230)	2060.70
²²⁸ Rn	(35500)	(1737500)	(2200)			(5600)	
²²⁸ Fr	(33280)	(1738920)	(4340)			(4450)	(7000)
²²⁸ Ra	28936.0.25	1742479.3	45.9.9		(4100)	6307.6.24	8010.100
²²⁸ Ac	28890.3	1741742.3	2127.3		4820.50	5027.3	5571.3
²²⁸ Th	26763.3	1743087.3			5520.12.22	7109.6.25	6372.0.23
²²⁸ Pa	28911.5	1740157.5		2148.4	6264.5.15	5981.8	4180.5
²²⁸ U	29218.16	1739068.16		307.16	6804.10	7861.23	4892.17
²²⁸ Np	(33700)	(1733800)		(4480)	(7420)	(6930)	(2590)
²²⁸ Pu	36070.30	1730650.30		(2370)	7950.20		3780.80
²²⁹ Fr	(35800)	(1744500)	(3400)			(5600)	(7000)
²²⁹ Ra	32430.60	1747050.60	1760.40		(3500)	4570.60	(8130)
²²⁹ Ac	30670.50	1748030.50	1100.50		4400.50	6290.50	5550.50
²²⁹ Th	29580.3	1748341.3			5167.6.10	5254.3	6599.3
²²⁹ Pa	29890.9	1747248.9		310.9	5836.5	7092.10	4162.9
²²⁹ U	31201.8	1745155.8		1311.11	6475.3	6087.17	4998.9
²²⁹ Np	33760.90	1741810.90		2560.90	7010.50	(8010)	2740.90
²²⁹ Pu	37390.70	1737400.70		3630.110	7590.50	6760.80	(3600)
²³⁰ Fr	(39600)	(1748700)	(5100)			(4300)	
²³⁰ Ra	34540.30	1753010.30	990.110		(3300)	5960.70	(8500)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²³⁰ Ac	33560 100	1753220 100	2700 100		3800 140	5190 110	6170 120
²³⁰ Th	30857.2 20	1755135.3 20			4770.0 15	6794.0 23	7110 50
²³⁰ Pa	32167 3	1753043 3	564 5	1310 3	5439.4 7	5795 9	4702 4
²³⁰ U	31603 5	1752825 5			5992.7 7	7670 9	5576 10
²³⁰ Np	35220 50	1748420 50		3620 50	6780 50	6610 100	3270 50
²³⁰ Pu	36930 24	1745933 24		1710 60	7175 15	8530 80	4120 90
²³¹ Fr	(42300)	(1754100)	(3900)			(5400)	
²³¹ Ra	(38400)	(1757200)	(2500)		(3000)	(4200)	(8500)
²³¹ Ac	35910 100	1758940 100	2100 100		3830 140	5720 140	5920 110
²³¹ Th	33810.5 20	1760253.3 20	389.5 17		4213.3 15	5118.04 20	7040 100
²³¹ Pa	33421 3	1759860 3			5149.9 8	6817 3	4725.2 17
²³¹ U	33803 4	1758696 4		382 3	5577 3	5871 6	5653 5
²³¹ Np	35610 50	1756100 50		1810 50	6370 50	7680 70	3280 50
²³¹ Pu	(38430)	(1752500)		(2820)	(7000)	(6570)	(4080)
²³¹ Am	(42400)	(1747700)		(4000)	(7500)		(1800)
²³² Fr	(46300)	(1758200)	(5600)			(4100)	
²³² Ra	(40700)	(1763000)	(1600)		(2800)	(5800)	(8900)
²³² Ac	39140 100	1763770 100	3700 100		(3440)	4840 140	(6500)
²³² Th	35443.7 20	1766691.4 21			4082.8 14	6438.1 12	7760 100
²³² Pa	35939 8	1765414 8	1337 7	495 8	4624 8	5554 8	5161 8
²³² U	34602 3	1765969 3			5413.55 14	7273 4	6108.4 22
²³² Np	(37350)	(1762440)		(2750)	(6020)	(6330)	(3740)
²³² Pu	38358 19	1760647 19		(1010)	6716 10	(8150)	4540 50
²³² Am	(43400)	(1754800)		(5000)	(7300)	(7100)	(2300)
²³³ Ra	(44700)	(1767100)	(3200)			(4100)	(8800)
²³³ Ac	(41500)	(1769500)	(2800)		(3280)	(5700)	(6500)
²³³ Th	38728.6 20	1771477.8 21	1245.1 14		3870 60	4786.35 25	7700 100
²³³ Pa	37483.5 23	1771940.5 23	570.1 20		4380 50	6526 8	5249.1 14
²³³ U	36913 3	1771728 3			4908.6 12	5759 3	6314 8
²³³ Np	37940 50	1769920 50		1030 50	5630 50	(7480)	3950 50
²³³ Pu	40040 50	1767030 50		2100 70	6420 50	6390 50	(4600)
²³³ Am	(43290)	(1763010)		(3250)	(7100)	(8200)	(2360)
²³³ Cm	(47300)	(1758200)		(4000)	(7500)		(3400)
²³⁴ Ra	(47100)	(1772800)	(2000)			(5700)	
²³⁴ Ac	(45100)	(1774000)	(4500)		(3080)	(4500)	(6900)
²³⁴ Th	40609 4	1777669 4	273 3		3640 30	6191 3	(8200)
²³⁴ Pa	40336 5	1777160 5	2195 4		4350 100	5219 5	5682 5
²³⁴ U	38140.6 20	1778572.5 20			4858.5 7	6844.2 21	6631.9 13
²³⁴ Np	39950 9	1775980 9		1810 8	5359 9	6060 50	4252 9
²³⁴ Pu	40338 7	1774810 7		388 11	6310 5	7780 50	4890 50
²³⁴ Am	(44520)	(1769850)		(4180)	(6870)	(6800)	(2810)
²³⁴ Cm	(46800)	(1766800)		(2300)	(7400)	(8600)	(3800)
²³⁵ Ac	(47600)	(1779500)	(3400)		(2900)	(5600)	(6800)
²³⁵ Th	44250 50	1782100 50	1930 70		(3400)	4430 50	(8100)
²³⁵ Pa	42320 50	1783240 50	1410 50		3990 110	6080 50	5570 50
²³⁵ U	40914.1 20	1783870.3 20			4678.7 7	5297.84 23	6711 4
²³⁵ Np	41037.8 21	1782964.3 22		123.7 9	5191.9 18	6984 8	4391.8 9
²³⁵ Pu	42179 21	1781040 21		1142 21	5951 20	6230 22	5060 22
²³⁵ Am	(44740)	(1777700)		(2560)	(6700)	(7900)	(2890)
²³⁵ Cm	(48060)	(1773600)		(3300)	(7200)	(6800)	(3800)
²³⁵ Bk	(52700)	(1768200)		(4600)	(7800)		(1400)
²³⁶ Ac	(51400)	(1783800)	(5100)		(2700)	(4300)	
²³⁶ Th	(46300)	(1788100)	(1000)		(3180)	(6000)	(8600)
²³⁶ Pa	45340 200	1788300 200	2900 200		3770 220	5050 210	6200 210
²³⁶ U	42440.6 19	1790415.0 20			4572.0 9	6544.8 5	7170 50
²³⁶ Np	43370 50	1788700 50	480 50	930 50	5010 50	5740 50	4830 50
²³⁶ Pu	42894 3	1788398 3			5867.07 8	7357 21	5433.2 19
²³⁶ Am	(46170)	(1784340)		(3280)	(6400)	(6640)	(3300)
²³⁶ Cm	(47880)	(1781840)		(1710)	(7100)	(8200)	(4100)
²³⁶ Bk	(53400)	(1775500)		(5500)	(7600)	(7400)	(1900)
²³⁷ Th	(50200)	(1792300)	(2600)		(3100)	(4200)	(8500)
²³⁷ Pa	47640 100	1794070 100	2250 100		(3700)	5780 220	(6000)
²³⁷ U	45386.1 20	1795540.9 20	518.6 6		4232.5 10	5125.9 5	7240 200
²³⁷ Np	44867.5 20	1795277.1 20			4959.1 12	6570 50	4862.1 3
²³⁷ Pu	45087.8 23	1794274.5 24		220.3 13	5749.5 23	5877.0 23	5570 50
²³⁷ Am	46550 50	1792030 50		1460 50	6181 5	(7700)	3640 50
²³⁷ Cm	(49270)	(1788530)		(2720)	(6800)	(6700)	(4200)
²³⁷ Bk	(53200)	(1783800)		(3900)	(7500)	(8300)	(2000)
²³⁷ Cf	(57800)	(1778400)		(4600)	(8100)		(2900)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²³⁸ Th	(52400)	(1798200)	(1600)		(2900)	(5900)	
²³⁸ Pa	50760 60	1799020 60	3460 60		(3200)	4940 120	(6700)
²³⁸ U	47303.7 20	1801694.6 20			4270 3	6153.7 12	7620 100
²³⁸ Np	47450.7 20	1800765.3 20	1292.0 7	147.1 11	4690 4	5488.09 20	5224.3 6
²³⁸ Pu	46158.7 20	1801274.9 20			5593.20 19	7000.5 14	5997.8 7
²³⁸ Am	48420 50	1798230 50		2260 50	6040 50	6200 70	3960 50
²³⁸ Cm	49380 40	1796480 40		970 60	6620 40	(7960)	4450 60
²³⁸ Bk	(54300)	(1790800)		(4900)	(7330)	(7000)	(2300)
²³⁸ Cf	(57200)	(1787100)		(2900)	(8000)	(8700)	(3300)
²³⁹ Pa	(53200)	(1804600)	(2600)		(3200)	(5600)	(6500)
²³⁹ U	50568.7 20	1806500.9 20	1263.5 15		3890 50	4806.26 21	7480 60
²³⁹ Np	49305.3 21	1806982.0 22	721.8 9		4560 50	6216.8 10	5287.4 15
²³⁹ Pu	48583.5 20	1806921.5 20			5244.50 23	5646.5 3	6156.2 6
²³⁹ Am	49386 3	1805336 3		802.9 20	5923.7 18	7100 50	4061.3 20
²³⁹ Cm	(51190)	(1802750)		(1800)	(6580)	(6270)	(4520)
²³⁹ Bk	(54400)	(1798800)		(3200)	(7200)	(8000)	(2300)
²³⁹ Cf	(58290)	(1794080)		(3900)	(7810)	(7000)	(3300)
²⁴⁰ Pa	(56800)	(1809100)	(4100)		(3000)	(4500)	
²⁴⁰ U	52709 5	1812432 5	388 16		(4000)	5931 5	(7800)
²⁴⁰ Np	52321 15	1812038 15	2200 15		4560 200	5056 15	5537 15
²⁴⁰ Pu	50121.3 19	1813454.9 20			5255.78 15	6533.5 5	6472.9 9
²⁴⁰ Am	51500 14	1811294 14		1379 14	5710 50	5957 14	4372 14
²⁴⁰ Cm	51716 3	1810296 3		215 14	6397.2 6	(7540)	4960 3
²⁴⁰ Bk	(55660)	(1805570)		(3940)	(7060)	(6800)	(2820)
²⁴⁰ Cf	(58030)	(1802420)		(2370)	7719 10	(8300)	(3600)
²⁴⁰ Es	(64200)	(1795500)		(6200)	(8400)		(1400)
²⁴¹ U	(56200)	(1817000)	(1900)		(3570)	(4600)	(7900)
²⁴¹ Np	54260 70	1818170 70	1310 70		4200 120	6140 70	5740 70
²⁴¹ Pu	52951.0 19	1818696.5 20	20.82 20		5140.1 5	5241.60 19	6659 15
²⁴¹ Am	52930.2 20	1817935.0 20			5637.81 12	6641 14	4480.1 3
²⁴¹ Cm	53697.6 23	1816385.3 23		767.4 12	6184.9 6	6089.4 24	5092 14
²⁴¹ Bk	(56100)	(1813200)		(2400)	(7130)	(7630)	(2910)
²⁴¹ Cf	(59400)	(1809200)		(3300)	(7660)	(6700)	(3600)
²⁴¹ Es	(64000)	(1803800)		(4600)	(8320)	(8300)	(1400)
²⁴² U	(58610)	(1822670)	(1200)		(3800)	(5700)	
²⁴² Np	(57410)	(1823090)	(2700)		(4220)	(4910)	(6100)
²⁴² Pu	54713.0 20	1825005.9 20			4984.4 9	6309.4 7	6830 70
²⁴² Am	55464.0 20	1823472.6 20	664.8 7	751.0 7	5588.34 25	5537.57 10	4776.03 22
²⁴² Cm	54799.2 20	1823355.0 20			6215.56 8	6969.8 13	5420.0 7
²⁴² Bk	(57800)	(1819570)		(3000)	(6960)	(6400)	(3190)
²⁴² Cf	59330 40	1817260 40		(1530)	7516 4	(8100)	(4060)
²⁴² Es	(64900)	(1810900)		(5600)	(8220)	(7100)	(1700)
²⁴² Fm	(68400)	(1806600)		(3500)	(8800)		(2800)
²⁴³ Np	(59870)	(1828700)	(2120)		(4200)	(5620)	(6030)
²⁴³ Pu	57750 3	1830040 3	582 3		4756 3	5035 3	(6950)
²⁴³ Am	57168.3 22	1829839.6 22			5438.1 9	6367.0 11	4833.7 12
²⁴³ Cm	57177.2 22	1829048.4 22		8.9 14	6168.8 10	5693.3 10	5575.8 12
²⁴³ Bk	58686 5	1826758 5		1508 5	6874 4	(7190)	3403 5
²⁴³ Cf	(60940)	(1823720)		(2250)	(7330)	(6460)	(4150)
²⁴³ Es	(64900)	(1819000)		(3900)	8072 10	(8100)	(1800)
²⁴³ Fm	(69410)	(1813690)		(4500)	8690 50	(7100)	(2800)
²⁴⁴ Np	(63200)	(1833400)	(3400)		(4000)	(4700)	
²⁴⁴ Pu	59800 5	1836062 5			4665.5 10	6021 4	(7360)
²⁴⁴ Am	59875.9 21	1835203.3 21	1428.1 9	76 5	5130 15	5363.7 9	5163 3
²⁴⁴ Cm	58447.8 19	1835849.0 20			5901.61 5	6800.7 11	6009.4 10
²⁴⁴ Bk	60703 14	1832811 14		2256 14	6778 4	6053 15	3763 14
²⁴⁴ Cf	61470 3	1831263 3		766 15	7329.1 18	(7540)	4505 5
²⁴⁴ Es	(66110)	(1825840)		(4640)	(8030)	(6800)	(2120)
²⁴⁴ Fm	(69000)	(1822200)		(2900)	(8550)	(8500)	(3100)
²⁴⁵ Pu	63098 14	1840835 14	1205 15		(4500)	4773 13	(7400)
²⁴⁵ Am	61893 4	1841257 4	894 3		5210 70	6054 3	5195 6
²⁴⁵ Cm	60999 3	1841369 3			5623.5 19	5519.7 19	6165.4 21
²⁴⁵ Bk	61809.6 25	1839776.1 25		810.2 24	6454.5 15	6965 14	3927.2 15
²⁴⁵ Cf	(63380)	(1837430)		(1570)	(7260)	(6160)	(4610)
²⁴⁵ Es	(66430)	(1833590)		(3050)	7909 3	(7700)	(2330)
²⁴⁵ Fm	(70200)	(1829000)		(3800)	(8440)	(6900)	(3200)
²⁴⁵ Md	(75500)	(1823000)		(5300)	(9080)		(800)
²⁴⁶ Pu	65389 15	1846615 15	401 14		(4350)	5780 20	
²⁴⁶ Am	64989 18	1846233 18	2376 18		(5150)	4976 18	5398 23

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²⁴⁶ Cm	62612.7 22	1847826.8 22			5474.8 10	6458.0 22	6570 4
²⁴⁶ Bk	63960 60	1845690 60		1350 60	6070 60	5920 60	4330 60
²⁴⁶ Cf	64085.7 22	1844789.1 22		120 60	6861.6 10	(7360)	5012.9 19
²⁴⁶ Es	(67970)	(1840130)		(3880)	(7740)	(6500)	(2700)
²⁴⁶ Fm	70120 40	1837190 40		(2160)	8374 14	(8200)	(3600)
²⁴⁶ Md	(76300)	(1830200)		(6200)	(8970)	(7200)	(1200)
²⁴⁷ Pu	(69000)	(1851100)	(1800)			(4500)	
²⁴⁷ Am	(67150)	(1852150)	(1620)		(4850)	(5910)	(5530)
²⁴⁷ Cm	65528 4	1852983 4	45 7		5353 3	5156 4	6750 18
²⁴⁷ Bk	65483 6	1852246 6			5889 5	6550 60	4419 5
²⁴⁷ Cf	66129 8	1850818 8		646 6	6527 8	6028 8	5120 60
²⁴⁷ Es	(68600)	(1847560)		(2480)	(7490)	(7430)	(2770)
²⁴⁷ Fm	(71560)	(1843830)		(2950)	8190 50	(6640)	(3700)
²⁴⁷ Md	(76200)	(1838400)		(4600)	(8910)	(8200)	(1200)
²⁴⁸ Am	(70560)	(1856810)	(3170)		(4900)	(4660)	(5700)
²⁴⁸ Cm	67386 5	1859196 5			5161.73 25	6213 5	(7050)
²⁴⁸ Bk	(68070)	(1857730)	(840)	(690)	(5770)	(5480)	(4740)
²⁴⁸ Cf	67233 5	1857784 5			6361 5	6967 9	5538 7
²⁴⁸ Es	(70290)	(1853950)		(3060)	(7160)	(6390)	(3130)
²⁴⁸ Fm	71897 12	1851556 12		(1610)	8002 11	(7730)	(4000)
²⁴⁸ Md	(77230)	(1845440)		(5330)	(8700)	(7000)	(1600)
²⁴⁹ Am	(73100)	(1862300)	(2400)			(5500)	
²⁴⁹ Cm	70744 5	1863909 5	901 5		5221 14	4713.5 3	(7100)
²⁴⁹ Bk	69843 3	1864028 3	124.0 14		5525.0 23	(6300)	4832 5
²⁴⁹ Cf	69719 3	1863369 3			6295.0 7	5585 5	(5640)
²⁴⁹ Es	(71170)	(1861140)		(1450)	(6940)	(7190)	(3350)
²⁴⁹ Fm	(73610)	(1857910)		(2440)	(7810)	(6360)	(3970)
²⁴⁹ Md	(77320)	(1853430)		(3700)	(8460)	(8000)	(1870)
²⁴⁹ No	(81800)	(1848200)		(4500)	(9170)	(8400)	(2700)
²⁵⁰ Cm	72983 11	1869742 11	37 12		5169 18	5832 10	(7400)
²⁵⁰ Bk	72946 4	1868997 4	1780 3		5532 18	4969 4	5087 6
²⁵⁰ Cf	71166.1 22	1869994.0 22			6128.44 19	6624.6 23	5966 3
²⁵⁰ Es	(73270)	(1867110)		(2100)	(6880)	(5980)	(3740)
²⁵⁰ Fm	74068 12	1865528 12		(800)	7557 12	(7610)	(4390)
²⁵⁰ Md	(78700)	(1860100)		(4600)	(8310)	(6700)	(2200)
²⁵⁰ No	(81500)	(1856530)		(2800)	(8950)	(8400)	(3100)
²⁵¹ Cm	76641 23	1874155 23	1420 20		(5200)	4413 25	
²⁵¹ Bk	75221 11	1874792 11	1093 10		(5650)	5796 11	5051 15
²⁵¹ Cf	74128 5	1875103 5			6175.8 10	5109 4	6106 5
²⁵¹ Es	74504 6	1873945 6		376 7	6597 3	(6830)	3951 6
²⁵¹ Fm	75979 8	1871688 8		1474 7	7425.1 20	6160 14	(4580)
²⁵¹ Md	(79100)	(1867780)		(3120)	(8070)	(7700)	(2260)
²⁵¹ No	(82870)	(1863240)		(3800)	(8890)	(6700)	(3100)
²⁵¹ Lr	(87900)	(1857400)		(5000)	(9300)		(900)
²⁵² Cm	(79100)	(1879800)	(500)			(5700)	
²⁵² Bk	(78530)	(1879560)	(2500)		(5500)	(4770)	(5400)
²⁵² Cf	76028 5	1881275 5			6216.87 4	6172 5	6482 11
²⁵² Es	77290 50	1879230 50	480 50	1260 50	(6790)	5290 50	4130 50
²⁵² Fm	76811 6	1878927 6			7152.7 20	7239 10	4982 8
²⁵² Md	(80700)	(1874260)		(3880)	(7980)	(6500)	(2570)
²⁵² No	82871 13	1871302 13		(2180)	8549 5	(8070)	(3520)
²⁵² Lr	(88800)	(1864600)		(5900)	(9100)	(7200)	(1400)
²⁵³ Bk	(80900)	(1885200)	(1600)		(5400)	(5700)	(5400)
²⁵³ Cf	79295 6	1886079 6	288 6		6126 4	4804 4	(6520)
²⁵³ Es	79007 3	1885584 3			6739.16 5	6350 50	4310 5
²⁵³ Fm	79341 5	1884468 5		334 4	7197 4	5541 7	5240 50
²⁵³ Md	(81300)	(1881730)		(1960)	(7710)	(7500)	(2800)
²⁵³ No	(84440)	(1877810)		(3100)	(8400)	(6500)	(3500)
²⁵³ Lr	(88730)	(1872730)		(4300)	(8990)	(8100)	(1430)
²⁵³ Rf	(93800)	(1866900)		(5000)	(9600)		(2300)
²⁵⁴ Bk	(84400)	(1889800)	(3100)			(4600)	
²⁵⁴ Cf	81335 12	1892111 12			5926 5	6032 12	(6900)
²⁵⁴ Es	81986 4	1890677 4	1088 3	652 13	6615.7 15	5092 5	4598 7
²⁵⁴ Fm	80898 3	1890983 3			7307.2 20	6514 5	5398 3
²⁵⁴ Md	(83580)	(1887520)		(2680)	(7890)	(5790)	(3050)
²⁵⁴ No	84718 18	1885598 18		(1140)	8226 13	(7790)	(3870)
²⁵⁴ Lr	(90000)	(1879600)		(5300)	(8850)	(6800)	(1800)
²⁵⁴ Rf	(93300)	(1875400)		(3300)	(9380)	(8500)	(2700)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²⁵⁵ Cf	(84800)	(1896710)	(720)		(5740)	(4600)	(6900)
²⁵⁵ Es	84083 <i>11</i>	1896652 <i>11</i>	290 <i>10</i>		6436.3 <i>13</i>	5975 <i>12</i>	4541 <i>16</i>
²⁵⁵ Fm	83793 <i>5</i>	1896159 <i>5</i>			7239.7 <i>18</i>	5177 <i>5</i>	5482 <i>6</i>
²⁵⁵ Md	84836 <i>7</i>	1894334 <i>7</i>		1043 <i>8</i>	7907 <i>4</i>	(6810)	3351 <i>7</i>
²⁵⁵ No	86845 <i>12</i>	1891542 <i>12</i>		2009 <i>11</i>	8442 <i>8</i>	5944 <i>21</i>	(4020)
²⁵⁵ Lr	(90140)	(1887470)		(3300)	(8610)	(7900)	(1870)
²⁵⁵ Rf	(94540)	(1882280)		(4400)	(9250)	(6800)	(2700)
²⁵⁵ Ha	(100000)	(1876000)		(5500)	(9700)		(600)
²⁵⁶ Cf	(87000)	(1902500)			(5600)	(5800)	
²⁵⁶ Es	(87180)	(1901630)	(1700)	(100)	(6230)	(4970)	(4910)
²⁵⁶ Fm	85480 <i>7</i>	1902543 <i>7</i>			7027 <i>5</i>	6384 <i>7</i>	5892 <i>12</i>
²⁵⁶ Md	87610 <i>50</i>	1899630 <i>50</i>		2130 <i>50</i>	7897 <i>16</i>	5300 <i>50</i>	3470 <i>50</i>
²⁵⁶ No	87817 <i>8</i>	1898641 <i>8</i>		210 <i>50</i>	8581 <i>5</i>	7099 <i>14</i>	4308 <i>10</i>
²⁵⁶ Lr	(92000)	(1893680)		(4180)	(8880)	(6200)	(2140)
²⁵⁶ Rf	94250 <i>30</i>	1890650 <i>30</i>		(2250)	8952 <i>23</i>	(8360)	(3180)
²⁵⁶ Ha	(100700)	(1883400)		(6500)	(9480)	(7400)	(1100)
²⁵⁷ Es	(89400)	(1907500)	(800)		(6050)	(5800)	(4900)
²⁵⁷ Fm	88584 <i>6</i>	1907511 <i>6</i>			6863.8 <i>14</i>	4967 <i>6</i>	(5890)
²⁵⁷ Md	88990 <i>3</i>	1906322 <i>3</i>		406 <i>7</i>	7557.6 <i>10</i>	6690 <i>50</i>	3779 <i>7</i>
²⁵⁷ No	90220 <i>30</i>	1904310 <i>30</i>		1230 <i>30</i>	8450 <i>30</i>	5670 <i>30</i>	4680 <i>60</i>
²⁵⁷ Lr	(92780)	(1900970)		(2560)	(9060)	(7300)	(2320)
²⁵⁷ Rf	(96000)	(1897000)		(3200)	(9150)	(6300)	(3300)
²⁵⁷ Ha	(100470)	(1891710)		(4500)	(9310)	(8300)	(1070)
²⁵⁸ Fm	(90420)	(1913750)			(6660)	(6240)	(6300)
²⁵⁸ Md	91683 <i>5</i>	1911701 <i>5</i>	(210)	(1260)	7271.3 <i>19</i>	5379 <i>5</i>	4190 <i>7</i>
²⁵⁸ No	(91470)	(1911130)			(8150)	(6820)	(4810)
²⁵⁸ Lr	(94900)	(1906920)		(3430)	8900 <i>20</i>	(5950)	(2600)
²⁵⁸ Rf	(96470)	(1904560)		(1570)	(9330)	(7600)	(3600)
²⁵⁸ Ha	(101900)	(1898300)		(5500)	(9550)	(6600)	(1400)
²⁵⁸ Sg	(105400)	(1894100)		(3500)	(9700)		(2400)
²⁵⁹ Fm	(93700)	(1918500)	(100)		(6470)	(4800)	
²⁵⁹ Md	(93620)	(1917840)			(7110)	(6140)	(4100)
²⁵⁹ No	(94100)	(1916570)		(490)	(7890)	(5440)	(4870)
²⁵⁹ Lr	(95940)	(1913960)		(1830)	(8670)	(7040)	(2830)
²⁵⁹ Rf	(98390)	(1910720)		(2460)	(9120)	(6150)	(3800)
²⁵⁹ Ha	(102200)	(1906100)		(3800)	(9640)	(7800)	(1600)
²⁵⁹ Sg	(106800)	(1900750)		(4600)	9830 <i>30</i>	(6700)	(2400)
²⁶⁰ Md	(96500)	(1923000)	(900)		(6900)	(5100)	(4400)
²⁶⁰ No	(95610)	(1923140)			(7700)	(6570)	(5300)
²⁶⁰ Lr	(98340)	(1919620)		(2740)	(8310)	(5670)	(3050)
²⁶⁰ Rf	(99140)	(1918040)		(800)	(8900)	(7320)	(4080)
²⁶⁰ Ha	(103790)	(1912600)		(4700)	9370 <i>70</i>	(6500)	(1890)
²⁶⁰ Sg	106600 <i>40</i>	1909020 <i>40</i>		(2800)	9920 <i>30</i>	(8270)	(2900)
²⁶⁰ Ns	(113500)	(1901400)		(6900)	(10300)		(600)
²⁶¹ No	(98500)	(1928300)			(7500)	(5200)	(5300)
²⁶¹ Lr	(99620)	(1926420)		(1100)	(8200)	(6800)	(3300)
²⁶¹ Rf	(101300)	(1923950)		(1690)	(8660)	(5910)	(4330)
²⁶¹ Ha	(104430)	(1920040)		(3100)	(9220)	(7400)	(2000)
²⁶¹ Sg	(108200)	(1915400)		(3800)	(9800)	(6400)	(2800)
²⁶¹ Ns	(113460)	(1909450)		(5200)	10560 <i>50</i>	(8100)	(430)
²⁶² No	(100200)	(1934700)			(7300)	(6400)	
²⁶² Lr	(102200)	(1931900)		(2000)	(8100)	(5500)	(3600)
²⁶² Rf	(102400)	(1930900)		(200)	(8490)	(7000)	(4500)
²⁶² Ha	(106330)	(1926210)		(3900)	(9010)	(6200)	(2260)
²⁶² Sg	(108500)	(1923300)		(2200)	(9600)	(7800)	(3200)
²⁶² Ns	(114600)	(1916400)		(6100)	(10220)	(6900)	(900)
²⁶³ Lr	(103800)	(1938400)			(7700)	(6500)	(3700)
²⁶³ Rf	(104830)	(1936560)		(1100)	(8300)	(5600)	(4600)
²⁶³ Ha	(107190)	(1933420)		(2360)	(8830)	(7210)	(2500)
²⁶³ Sg	(110210)	(1929620)		(3010)	(9390)	(6400)	(3410)
²⁶³ Ns	(114700)	(1924300)		(4500)	(10100)	(7900)	(1100)
²⁶³ Hs	(119900)	(1918400)		(5200)	(10700)		(2000)
²⁶⁴ Rf	(106200)	(1943300)			(8100)	(6700)	(4900)
²⁶⁴ Ha	(109430)	(1939260)		(3300)	(8660)	(5800)	(2700)
²⁶⁴ Sg	(110800)	(1937100)		(1400)	(9210)	(7500)	(3700)
²⁶⁴ Ns	(116200)	(1930900)		(5400)	(9970)	(6600)	(1300)
²⁶⁴ Hs	119610 <i>50</i>	1926720 <i>50</i>		(3400)	10591 <i>20</i>	(8400)	(2400)
²⁶⁵ Ha	(110500)	(1946200)			(8490)	(7000)	(2900)

Isotope	Mass Excess	Binding Energy	Q_{β^-}	Q_{EC}	Q_{α}	S_n	S_p
²⁶⁵ Sg	(112770)	(1943200)		(2200)	(9050)	(6100)	(3900)
²⁶⁵ Ns	(116600)	(1938600)		(3800)	(9800)	(7600)	(1400)
²⁶⁵ Hs	(121100)	(1933300)		(4500)	(10430)	(6600)	(2400)
²⁶⁵ Mt	(127200)	(1926400)		(6100)	(11300)		(-300)
²⁶⁶ Sg	(113600)	(1950500)			8760 <i>50</i>	(7300)	(4200)
²⁶⁶ Ns	(118300)	(1945000)		(4700)	(9600)	(6400)	(1800)
²⁶⁶ Hs	(121100)	(1941300)		(2800)	(10200)	(8000)	(2800)
²⁶⁶ Mt	(128500)	(1933200)		(7400)	(11480)	(6800)	(-100)
²⁶⁷ Ns	(119000)	(1952300)			(9400)	(7400)	(1900)
²⁶⁷ Hs	(122750)	(1947800)		(3800)	(10110)	(6500)	(2900)
²⁶⁷ Mt	(128100)	(1941700)		(5400)	(11000)	(8500)	(300)
²⁶⁷ 10	(134100)	(1934900)		(6000)	(11780)		(1700)
²⁶⁸ Hs	(123100)	(1955500)			(9900)	(7700)	(3200)
²⁶⁸ Mt	(129300)	(1948500)		(6200)	(10700)	(6900)	(700)
²⁶⁸ 10	(133700)	(1943400)		(4400)	(11700)	(8500)	(1700)
²⁶⁹ Hs	(124900)	(1961800)			(9700)	(6200)	
²⁶⁹ Mt	(129600)	(1956300)		(4600)	(10500)	(7800)	(800)
²⁶⁹ 10	(135200)	(1949900)		(5600)	(11680)	(6600)	(1400)
²⁷⁰ Mt	(131100)	(1962900)			(10400)	(6600)	(1100)
²⁷⁰ 10	(134700)	(1958500)		(3600)	(11200)	(8600)	(2100)
²⁷¹ Mt	(131600)	(1970500)			(10100)	(7600)	
²⁷¹ 10	(136070)	(1965200)		(4500)	(10900)	(6700)	(2300)
²⁷² 10	(136300)	(1973100)			(10800)	(7900)	(2600)
²⁷² 11	(143000)	(1965600)		(6700)	(11230)		(400)
²⁷³ 10	(139000)	(1978400)			(11670)	(5300)	