$^{82}_{37}\mathrm{Rb}_{45}$

1 Decay Scheme

Le rubidium 82 se désintègre par capture électronique vers des niveaux excités et le niveau fondamental du krypton 82.

Rb-82 decays by electron capture to excited levels and to the ground state of Kr-82.

2 Nuclear Data

$T_{1/2}(^{82}\mathrm{Rb}\ )$: 1,2652 (45) min
$Q^{+}(^{82}\mathrm{Rb}\ )$: 4403 (3) keV

2.1 Electron Capture Transitions

	Energy (keV)	Probability (%)	Nature	lg ft	P_K	P_L	P_M
$\epsilon_{0,24}$	446,9 (30)	0,00009 (2)		7,1	0,8722 (15)	0,1061 (12)	0,0192 (4)
$\epsilon_{0,23}$	491,9 (30)	0,00010 (2)		7,1			
$\epsilon_{0,22}$	521,9 (30)	0,00024 (5)		6,8			
$\epsilon_{0,21}$	567,2 (30)	0,00089 (5)		6,3			
$\epsilon_{0,20}$	587,9 (30)	0,0019 (8)		5,6			
$\epsilon_{0,19}$	661 (3)	0,0036 (6)		5,9			
$\epsilon_{0,18}$	686,2 (30)	0,008 (3)		5,8			
$\epsilon_{0,17}$	838,4 (30)	0,0034 (31)		6			
$\epsilon_{0,16}$	945,5 (30)	0,000111 (23)		7,7			
$\epsilon_{0,15}$	1047,7 (30)	0,00134 (13)		6,7			
$\epsilon_{0,14}$	1216,2 (30)	0,0265 (15)		5,5	0,8763 (15)	0,1028 (12)	0,0185 (4)
$\epsilon_{0,13}$	1458,9 (30)	0,0500 (19)		5,4	0,8766 (15)	0,1025 (12)	0,0185 (4)
$\epsilon_{0,12}$	1747,2 (30)	0,0142 (17)		6,1	0,8770 (14)	0,1022 (12)	0,0184 (4)
$\epsilon_{0,11}$	1841,3 (30)	0,0011 (6)		7,3			
$\epsilon_{0,10}$	1846,7 (30)	0,00023 (11)		10			
$\epsilon_{0,9}$	1894 (3)	0,0011 (6)		7,4			
$\epsilon_{0,8}$	1923,3 (30)	0,0682 (14)		5,5	0,8771 (14)	0,1021 (12)	0,0184 (4)
$\epsilon_{0,7}$	1952,9 (30)	0,0105 (8)		6,3	0,8771 (14)	0,1021 (12)	0,0184 (4)
$\epsilon_{0,6}$	2231,3 (30)	0,283 (5)	Allowed	5	0,8773 (14)	0,1019 (12)	0,0184 (4)
$\epsilon_{0,5}$	2446,2 (30)	0,0047 (8)		6,7			
$\epsilon_{0,4}$	2582,4 (30)	0,00003 (3)	Unique 2nd Forbidden	11,5			
$\epsilon_{0,3}$	2915,4 (30)	0,0096 (9)	Allowed	6,7			

	Energy (keV)	Probability (%)	Nature	lg ft	P_K	P_L	P_M
$\epsilon_{0,2}$	2928,1 (30)	0,0284 (14)	Allowed	6,3	0,8776 (14)	0,1017 (12)	0,0183 (4)
$\epsilon_{0,1}$	3626,5 (30)	1,06 (2)	Allowed	4,8	0,8778 (14)	0,1016 (12)	0,0183 (4)
$\epsilon_{0,0}$	4403 (3)	3,01 (3)	Allowed	4,6	0,8779 (14)	0,1014 (12)	0,0183 (4)

2.2 β^+ Transitions

	Energy (keV)	Probability (%)	Nature	lg ft
$\beta^+_{0,12}$	725,2 (30)	0,00284 (34)		6,1
$\beta^+_{0,11}$	819,3 (30)	0,00033 (19)		7,3
$\beta^+_{0,10}$	824,7 (30)	0,00007 (4)		10
$\beta^+_{0,9}$	872 (3)	0,00041 (25)		7,4
$\beta^+_{0,8}$	901,3 (30)	0,0288 (7)		5,5
$\beta^+_{0,7}$	930,9 (30)	0,0050 (4)		6,3
$\beta^+_{0,6}$	1209,3 (30)	0,317 (6)	Allowed	5
$\beta^+_{0,5}$	1424,2 (30)	0,00890 (14)		6,7
$\beta^+_{0,4}$	1560,4 (30)	0,00007 (7)	Unique 2nd Forbidden	11,5
$\beta^+_{0,3}$	1893,4 (30)	0,0444 (41)	Allowed	6,7
$\beta^+_{0,2}$	1906,1 (30)	0,135 (7)	Allowed	6,3
$\beta^+_{0,1}$	2604,5 (30)	13,10 (19)	Allowed	4,8
$\beta^+_{0,0}$	3381 (3)	81,81 (24)	Allowed	4,6

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K (10^{-4})	α_L (10^{-5})	α_M (10^{-6})	α_T (10^{-4})
$\gamma_{8,5}$(Kr)	522,923 (36)	0,0045 (15)					
$\gamma_{6,2}$(Kr)	696,786 (32)	0,071 (6)					
$\gamma_{2,1}$(Kr)	698,372 (14)	0,159 (11)					
$\gamma_{3,1}$(Kr)	711,10 (7)	0,060 (4)					
$\gamma_{1,0}$(Kr)	776,522 (10)	15,03 (19)	E2	8,19 (12)	8,84 (13)	14,3 (2)	9,23 (13)
$\gamma_{20,13}$(Kr)	871 (1)	0,0014 (8)					
$\gamma_{7,2}$(Kr)	975,20 (9)	0,0084 (11)					
$\gamma_{8,3}$(Kr)	992,10 (8)	0,0018 (8)					
$\gamma_{9,3}$(Kr)	1021,4 (5)	0,0015 (9)					
$\gamma_{4,1}$(Kr)	1044,08 (40)	0,0009 (6)					
$\gamma_{10,2}$(Kr)	1081,4 (7)	0,00030 (15)					
$\gamma_{11,2}$(Kr)	1086,8 (5)	0,0014 (8)					
$\gamma_{13,4}$(Kr)	1123,54 (40)	0,0008 (6)					
$\gamma_{12,3}$(Kr)	1168,20 (12)	0,0014 (6)					
$\gamma_{5,1}$(Kr)	1180,275 (22)	0,0165 (15)					
$\gamma_{12,2}$(Kr)	1180,93 (10)	0,0030 (15)					
$\gamma_{6,1}$(Kr)	1395,158 (32)	0,529 (8)	E2	2,12 (3)	2,24 (4)	3,63 (5)	2,90 (4)
$\gamma_{2,0}$(Kr)	1474,894 (10)	0,0904 (24)	E2	1,90 (3)	2,00 (3)	3,24 (5)	2,89 (4)
$\gamma_{17,5}$(Kr)	1607,8 (3)	0,00225 (30)					
$\gamma_{7,1}$(Kr)	1673,57 (9)	0,0071 (5)					
$\gamma_{14,3}$(Kr)	1699,20 (9)	0,0015 (8)					
$\gamma_{8,1}$(Kr)	1703,198 (32)	0,0505 (11)					

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K (10^{-4})	α_L (10^{-5})	α_M (10^{-6})	α_T (10^{-4})
$\gamma_{14,2}$(Kr)	1711,93 (5)	0,00165 (30)					
$\gamma_{19,5}$(Kr)	1785,16 (8)	0,0030 (6)					
$\gamma_{12,1}$(Kr)	1879,3 (1)	0,0101 (6)					
$\gamma_{5,0}$(Kr)	1956,797 (20)	0,0068 (6)					
$\gamma_{13,1}$(Kr)	2167,618 (41)	0,0431 (6)					
$\gamma_{18,2}$(Kr)	2241,94 (15)	0,0009 (8)					
$\gamma_{14,1}$(Kr)	2410,30 (5)	0,0233 (12)					
$\gamma_{8,0}$(Kr)	2479,72 (3)	0,0401 (16)					
$\gamma_{15,1}$(Kr)	2578,80 (19)	0,00105 (11)					
$\gamma_{12,0}$(Kr)	2655,82 (10)	0,0026 (6)					
$\gamma_{17,1}$(Kr)	2788,08 (30)	0,00114 (8)					
$\gamma_{18,1}$(Kr)	2940,31 (15)	0,0071 (29)					
$\gamma_{13,0}$(Kr)	2944,14 (4)	0,0075 (15)					
$\gamma_{19,1}$(Kr)	2965,44 (8)	0,00060 (5)					
$\gamma_{21,1}$(Kr)	3059,3 (5)	0,00068 (5)					
$\gamma_{22,1}$(Kr)	3104,6 (5)	0,00015 (5)					
$\gamma_{15,0}$(Kr)	3355,32 (19)	0,000285 (30)					
$\gamma_{16,0}$(Kr)	3457,5 (7)	0,000111 (23)					
$\gamma_{20,0}$(Kr)	3815,1 (10)	0,000451 (31)					
$\gamma_{21,0}$(Kr)	3835,8 (5)	0,000219 (23)					
$\gamma_{22,0}$(Kr)	3881,1 (5)	0,000087 (21)					
$\gamma_{23,0}$(Kr)	3911,1 (10)	0,000105 (15)					
$\gamma_{24,0}$(Kr)	3956,1 (10)	0,000090 (15)					

3 Atomic Data

3.1 Kr

ω_K : 0,652 (4)
$\bar{\omega}_L$: 0,0215 (6)
n_{KL} : 1,149 (4)

3.1.1 X Radiations

		Energy (keV)	Relative probability
X_K			
	$K\alpha_2$	12,599	51,86
	$K\alpha_1$	12,65	100
	$K\beta_3$	14,105	23,96
	$K\beta_1$	14,113	
	$K\beta_5''$	14,238	
	$K\beta_2$	14,315	2,42
	$K\beta_4$	14,328	
X_L			
	$L\ell$	1,387	
	$L\alpha$	1,585 - 1,586	
	$L\eta$	1,439	
	$L\beta$	1,637 - 1,831	
	$L\gamma$	1,706 - 1,911	

3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger K		
KLL	10,398 - 10,885	100
KLX	12,077 - 12,637	34,7
KXY	13,741 - 14,298	3,02
Auger L	1,09 - 1,91	

4 Electron and Positron Emissions

		Energy (keV)	Electrons (per 100 disint.)
e_{AL}	(Kr)	1,09 - 1,91	4,961 (25)
e_{AK}	(Kr)		
	KLL	10,398 - 10,885	1,394 (20)
	KLX	12,077 - 12,637	
	KXY	13,741 - 14,298	
$\beta^+_{0,0}$	max:	3381 (3)	81,81 (24)
	avg:	1535,6 (15)	
$\beta^+_{0,1}$	max:	2604,5 (30)	13,10 (19)
	avg:	1168,5 (15)	
$\beta^+_{0,2}$	max:	1906,1 (30)	0,135 (7)
	avg:	844,1 (14)	
$\beta^+_{0,3}$	max:	1893,4 (30)	0,0444 (41)
	avg:	838,3 (14)	
$\beta^+_{0,4}$	max:	1560,4 (30)	0,00007 (7)
	avg:	735,6 (15)	
$\beta^+_{0,5}$	max:	1424,2 (30)	0,00890 (14)
	avg:	624,8 (14)	
$\beta^+_{0,6}$	max:	1209,3 (30)	0,317 (6)
	avg:	528,6 (14)	
$\beta^+_{0,7}$	max:	930,9 (30)	0,0050 (4)
	avg:	405,7 (14)	
$\beta^+_{0,8}$	max:	901,3 (30)	0,0288 (7)
	avg:	392,7 (14)	
$\beta^+_{0,9}$	max:	872 (3)	0,00041 (25)
	avg:	380,0 (14)	
$\beta^+_{0,10}$	max:	824,7 (30)	0,00007 (4)
	avg:	359,4 (14)	
$\beta^+_{0,11}$	max:	819,3 (30)	0,00033 (19)
	avg:	357,0 (14)	

		Energy (keV)	Electrons (per 100 disint.)
$\beta^+_{0,12}$	max:	725,2 (30)	0,00284 (34)
	avg:	316,2 (13)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy (keV)	Photons (per 100 disint.)	
XL	(Kr)	1,387 - 1,911	0,1066 (18)	
XKα_2	(Kr)	12,599	0,760 (9)	Kα
XKα_1	(Kr)	12,65	1,466 (16)	
XKβ_3	(Kr)	14,105	0,351 (5)	K$'\beta_1$
XKβ_1	(Kr)	14,113		
XKβ''_5	(Kr)	14,238		
XKβ_2	(Kr)	14,315	0,0354 (12)	K$'\beta_2$
XKβ_4	(Kr)	14,328		

5.2 Gamma Emissions

	Energy (keV)	Photons (per 100 disint.)
$\gamma^{\pm}$	511	190,9 (6)
$\gamma_{8,5}$(Kr)	522,8 (5)	0,0045 (15)
$\gamma_{6,2}$(Kr)	696,86 (15)	0,071 (6)
$\gamma_{2,1}$(Kr)	698,37 (5)	0,159 (11)
$\gamma_{3,1}$(Kr)	711,2 (1)	0,060 (4)
$\gamma_{1,0}$(Kr)	776,52 (1)	15,02 (19)
$\gamma_{20,13}$(Kr)	869,3 (4)	0,0014 (8)
$\gamma_{7,2}$(Kr)	975,2 (1)	0,0084 (11)
$\gamma_{8,3}$(Kr)	992,2 (1)	0,0018 (8)
$\gamma_{9,3}$(Kr)	1021,4 (5)	0,0015 (9)
$\gamma_{4,1}$(Kr)	1044,1 (5)	0,0009 (6)
$\gamma_{10,2}$(Kr)	1081,4 (7)	0,00030 (15)
$\gamma_{11,2}$(Kr)	1086,8 (5)	0,0014 (8)
$\gamma_{13,4}$(Kr)	1123,6 (7)	0,0008 (6)
$\gamma_{12,3}$(Kr)	1168,2 (2)	0,0014 (6)
$\gamma_{5,1}$(Kr)	1180,27 (2)	0,0165 (15)
$\gamma_{12,2}$(Kr)	1181,3	0,0030 (15)
$\gamma_{6,1}$(Kr)	1395,14 (3)	0,529 (8)
$\gamma_{2,0}$(Kr)	1474,88 (1)	0,0904 (24)

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{17,5}$(Kr)	1607,7 (3)	0,00225 (30)
$\gamma_{7,1}$(Kr)	1673,55 (9)	0,0071 (5)
$\gamma_{14,3}$(Kr)	1698,7 (3)	0,0015 (8)
$\gamma_{8,1}$(Kr)	1703,19 (4)	0,0505 (11)
$\gamma_{14,2}$(Kr)	1711,9 (4)	0,00165 (30)
$\gamma_{19,5}$(Kr)	1785,13 (7)	0,0030 (6)
$\gamma_{12,1}$(Kr)	1879,18 (15)	0,0101 (6)
$\gamma_{5,0}$(Kr)	1956,75 (4)	0,0068 (6)
$\gamma_{13,1}$(Kr)	2167,59 (4)	0,0431 (6)
$\gamma_{18,2}$(Kr)	2241,98 (17)	0,0009 (8)
$\gamma_{14,1}$(Kr)	2410,26 (5)	0,0233 (12)
$\gamma_{8,0}$(Kr)	2479,65 (4)	0,0401 (16)
$\gamma_{15,1}$(Kr)	2578,7 (2)	0,00105 (11)
$\gamma_{12,0}$(Kr)	2655,85 (15)	0,0026 (6)
$\gamma_{17,1}$(Kr)	2788,4 (5)	0,00114 (8)
$\gamma_{18,1}$(Kr)	2940,0 (3)	0,0071 (29)
$\gamma_{13,0}$(Kr)	2944,0 (2)	0,0075 (15)
$\gamma_{19,1}$(Kr)	2966,3 (7)	0,00060 (5)
$\gamma_{21,1}$(Kr)	3059,2 (5)	0,00068 (5)
$\gamma_{22,1}$(Kr)	3104,5 (5)	0,00015 (5)
$\gamma_{15,0}$(Kr)	3355,6 (5)	0,000285 (30)
$\gamma_{16,0}$(Kr)	3457,4 (7)	0,000111 (23)
$\gamma_{20,0}$(Kr)	3815 (1)	0,000451 (31)
$\gamma_{21,0}$(Kr)	3836 (1)	0,000219 (23)
$\gamma_{22,0}$(Kr)	3881 (1)	0,000087 (21)
$\gamma_{23,0}$(Kr)	3911 (1)	0,000105 (15)
$\gamma_{24,0}$(Kr)	3956 (1)	0,000090 (15)

6 Main Production Modes

$\left\{ \begin{array}{l} \mathrm{Rb-nat(p,xn)Sr-82} \\ \text{Possible impurities: Sr} - 85 \end{array} \right.$

$\left\{ \begin{array}{l} \mathrm{Rb-85(p,4n)Sr-82} \\ \text{Possible impurities: Sr} - 85 \end{array} \right.$

$\mathrm{Sr-82(E.C.)Rb-82}$

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(Q)

$^{82}_{37}Rb_{45}$

1^+ ; 0

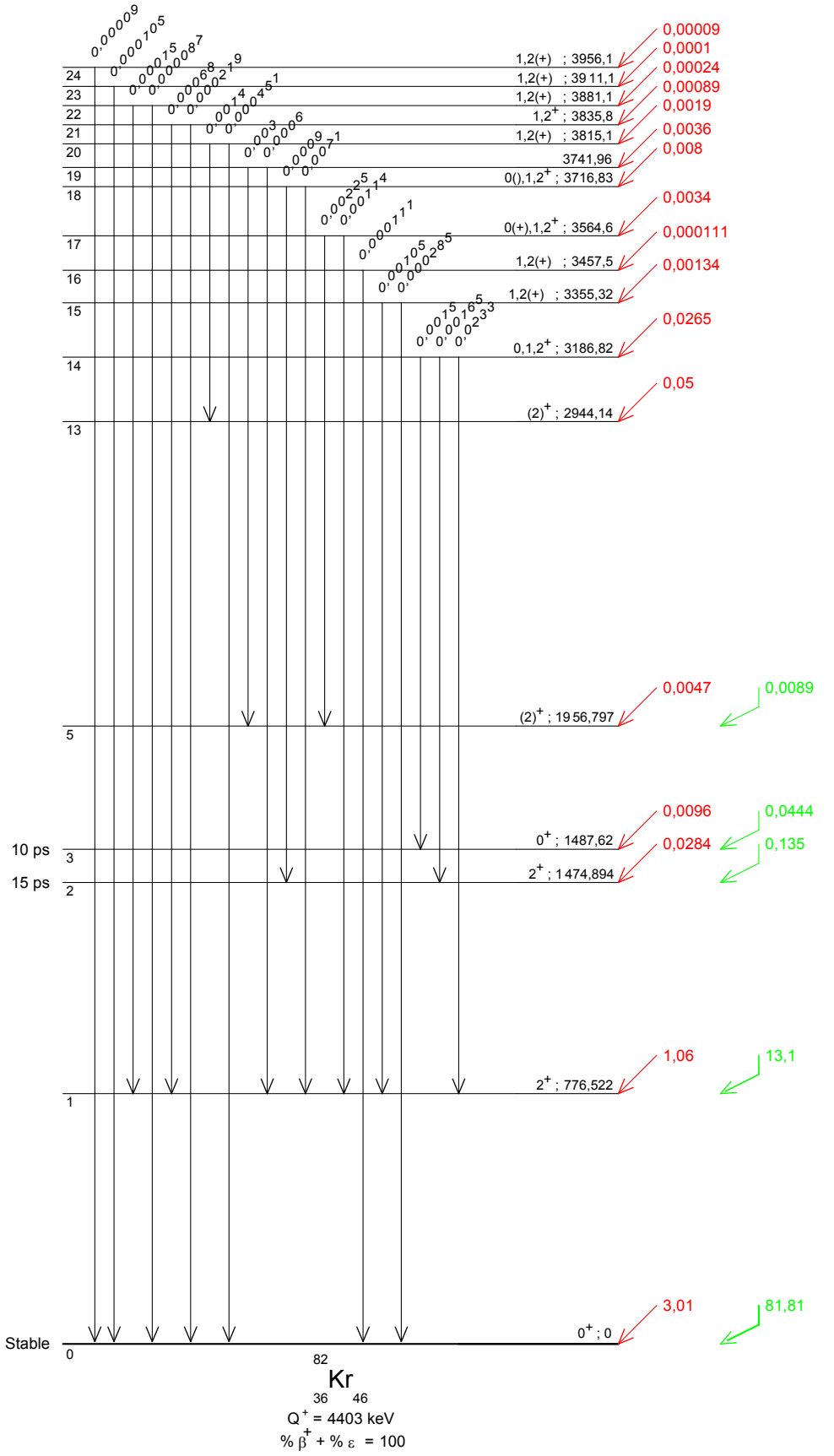
1,2652 (45) min

82 Rb 37 45

ε

β+

γ Emission intensities per 100 disintegrations

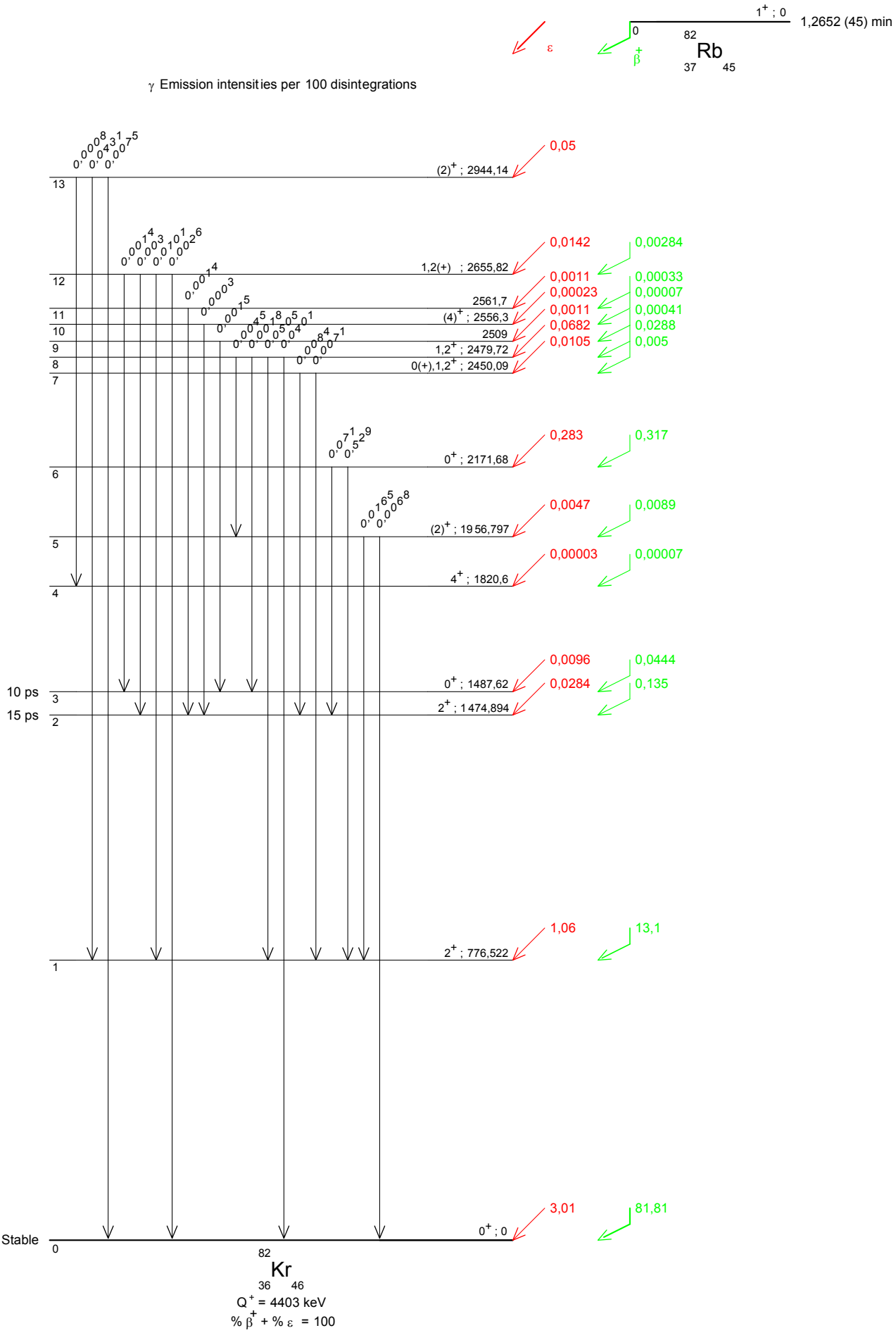


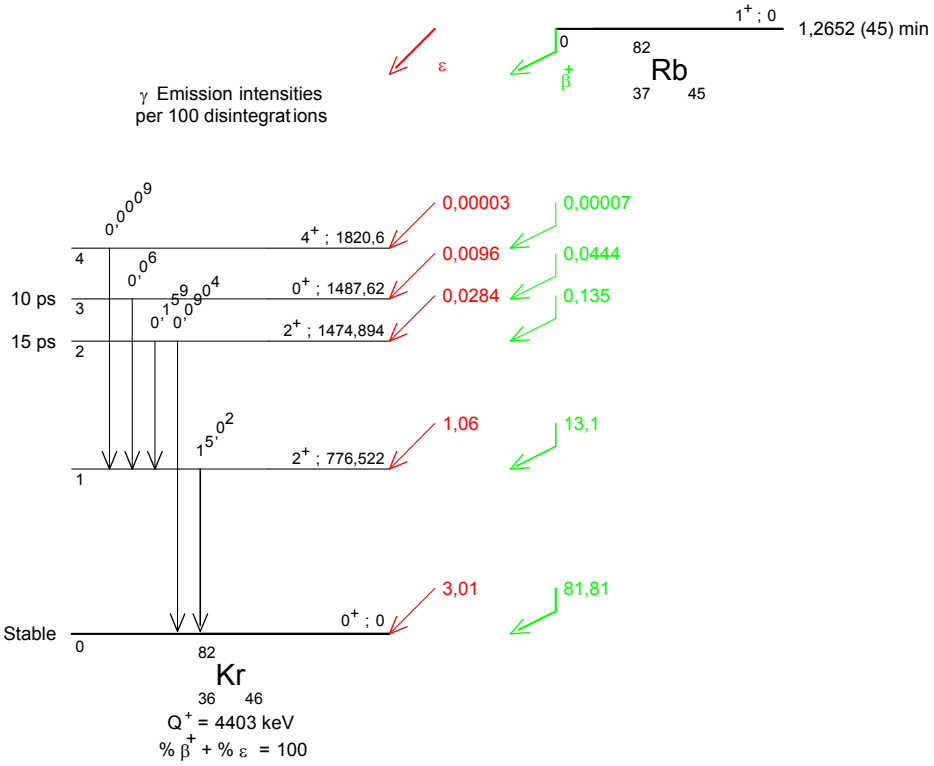
82 Kr 36 46

Q^+ = 4403 keV

% β^+ + % ε = 100

$^{82}_{37}Rb_{45}$


1+ ; 0
1,2652 (45) min
ε
β+
82 Rb 37 45
γ Emission intensities per 100 disintegrations
(2)+ ; 2944,14
1,2(+) ; 2655,82
2561,7
(4)+ ; 2556,3
2509
1,2+ ; 2479,72
0(+),1,2+ ; 2450,09
0+ ; 2171,68
(2)+ ; 1956,797
4+ ; 1820,6
0+ ; 1487,62
2+ ; 1474,894
2+ ; 776,522
0+ ; 0
10 ps
15 ps
Stable
82 Kr 36 46
Q+ = 4403 keV
% β+ + % ε = 100


1+ ; 0
1,2652 (45) min
ε
0
β+
82
Rb
37
45
γ Emission intensities
per 100 disintegrations
0,00003
0,00007
4+ ; 1820,6
0,0096
0,0444
0+ ; 1487,62
0,0284
0,135
2+ ; 1474,894
10 ps
15 ps
1,06
13,1
2+ ; 776,522
3,01
81,81
0+ ; 0
Stable
Kr
36
46
Q+ = 4403 keV
% β+ + % ε = 100