^{82}Rb ε+β^+ decay (1.2575 min) 2016Ni03,1983Me08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne	NDS 157,260 (2019)	1-Mar-2019

Parent: ^{82}Rb: E=0; J$^\pi$=1$^+$; T$_{1/2}$=1.2575 min *2*; Q(ε)=4404 *3*; %ε+%β^+ decay=100
^{82}Rb-J$^\pi$,T$_{1/2}$: From the Adopted Levels of ^{82}Rb.
^{82}Rb-Q(ε): From 2017Wa10.
Based on XUNDL compilation of 2016Ni03 by E.A. McCutchan (NNDC,BNL), December 30, 2017 and 2012Gr03 compilation by J. Chen (NSCL, MSU): February 20, 2015.
2016Ni03: Source of ^{82}Sr produced by irradiating thick RbCl targets with protons at the Brookhaven Linear Isotope Producer (BLIP), followed by chemical separation. Source for measurement was 100 μCi. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ using the Gammasphere array consisting of 89 Compton-suppressed HPGe detectors.
2012Gr03: A technique developed to measure absolute intensity (photons/100 decays) of a gamma ray in ^{82}Rb to ^{82}Kr decay by ion-implantation.
2012Gr03: ^{82}Rb ions were produced from the ε decay of the radioactive ^{82}Sr beam, which was produced and accelerated above to 2.5 MeV/nucleon at the Holifield Radioactive Ion Beam Facility (HRIBF) at Oak Ridge National Laboratory. The beam was delivered to an ionization chamber for counting individual beam particles and measuring energy loss and then implanted into thin aluminum foils for subsequent offline γ-ray decay measurements with a Ge detector. Measured Eγ, Iγ, total count of decaying nuclei. Deduced the absolute γ-ray emission probability.
All data are from 2016Ni03, unless given otherwise. The decay scheme is from 2016Ni03 which has added additional levels to original scheme from 1983Me08.
1983Me08: Ge(Li), measured Eγ, Iγ, $\gamma\gamma$.
1985Ze03: Measured ce, Magnetic spectrometer.
1969Be74: Measured β^+ spectrum.
2001Cr03: Measured β^+(E,θ,h), studied parity violation.
1969Ak03: Measured Internal Bremsstrahlung spectrum.
Other: 1970Gr01.

^{82}Kr Levels

E(level)[†]	J$^\pi$[‡]
0	0$^+$
776.523 *8*	2$^+$
1474.904 *8*	2$^+$[#]
1487.70 *5*	0$^+$
1820.538 *13*	4$^+$
1956.771 *16*	(2$^+$)[#]
2094.018 *10*	3$^+$
2171.81 *5*	0$^+$[#]
2450.19 *5*	0$^+$[#]
2480.06 *3*	2$^+$[#]
2547.468 *13*	(3$^-$)
2655.96 *4*	2$^+$[#]
2676.0 *3*	
2684.45 *12*	
2944.52 *4*	2[#]
2964.81 *16*	
2993.43 *18*	
3131.35 *17*	
3187.15 *5*	(0)$^+$[#]
3207.1 *3*	
3217.2 *3*	
3234.06 *10*	(0$^+$)[#]

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^{82}Rb $\varepsilon+\beta^+$ decay (1.2575 min) 2016Ni03,1983Me08 (continued)

^{82}Kr Levels (continued)

E(level)†	J$^\pi$‡	Comments
3285.81 *5*		
3355.99 *7*	1,2$^{(+)}$	
3438.15 *12*		
3457.21 *14*	1,2$^{(+)}$	
3565.12 *5*	(0)$^+$#	
3716.15 *6*	(2$^+$)#	J$^\pi$: From Adopted Levels; 0$^+$ in 2016Ni03 from $\gamma\gamma(\theta)$.
3742.76 *6*		
3815.23 *7*	1,2$^{(+)}$	
3836.13 *6*	1,2	
3881.00 *7*	1,2$^{(+)}$	
3910.85 *12*	1,2$^{(+)}$	
3920.01 *24*		
3958.05 *14*	1,2$^{(+)}$	

† From a least-squares fit to Eγ.
‡ As given in 2016Ni03, obtained from $\gamma\gamma(\theta)$ analysis (as noted), previous literature values, and decay patterns.
# J determined through $\gamma\gamma(\theta)$ analysis (2016Ni03). Unique 0-2-0 pattern determined for 1395γ-775γ (2016Ni03,1970Hr02); 2410γ-776γ, 2457γ-776γ, 2940γ-776γ, 975γ-1475γ, 1608γ-1956γ cascades (2016Ni03).

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ ‡	Iε‡	Log *ft*	I($\varepsilon+\beta^+$)†‡	Comments
(446.0 *32*)	3958.05		1.22×10^{-4} *10*	6.96 *4*	1.22×10^{-4} *10*	εK=0.8720; εL=0.10608 *4*; εM+=0.021916 *9*
(484.0 *32*)	3920.01		6.0×10^{-5} *15*	7.34 *11*	6.0×10^{-5} *15*	εK=0.8725; εL=0.10566 *3*; εM+=0.021817 *8*
(493.2 *32*)	3910.85		0.000143 *11*	6.98 *4*	0.000143 *11*	εK=0.8726; εL=0.10557 *3*; εM+=0.021795 *7*
(523.0 *32*)	3881.00		1.25×10^{-3} *10*	6.09 *4*	1.25×10^{-3} *10*	εK=0.8730; εL=0.10530 *3*; εM+=0.021731 *7*
(567.9 *32*)	3836.13		0.00223 *14*	5.91 *3*	0.00223 *14*	εK=0.8734; εL=0.10494 *3*; εM+=0.021647 *6*
(588.8 *32*)	3815.23		6.8×10^{-4} *4*	6.46 *3*	6.8×10^{-4} *4*	εK=0.8736; εL=0.10480 *2*; εM+=0.021613 *5*
(661.2 *32*)	3742.76		0.00505 *22*	5.689 *20*	0.00505 *22*	εK=0.8741; εL=0.10436 *2*; εM+=0.021511 *4*
(687.9 *32*)	3716.15		0.00524 *18*	5.708 *16*	0.00524 *18*	εK=0.8743; εL=0.10423 *2*; εM+=0.021479 *4*
(838.9 *32*)	3565.12		0.0057 *3*	5.847 *23*	0.0057 *3*	εK=0.8750; εL=0.1036; εM+=0.021336 *3*
(946.8 *32*)	3457.21		0.00042 *6*	7.09 *7*	0.00042 *6*	εK=0.8754; εL=0.1033; εM+=0.02126
(965.9 *32*)	3438.15		9.9×10^{-4} *10*	6.73 *5*	9.9×10^{-4} *10*	εK=0.8755; εL=0.1033; εM+=0.02125
(1048.0 *32*)	3355.99		0.00139 *9*	6.66 *3*	0.00139 *9*	εK=0.8757; εL=0.1031; εM+=0.02121
(1118.2 *32*)	3285.81		0.00405 *17*	6.248 *19*	0.00405 *17*	εK=0.8758; εL=0.1029; εM+=0.02118
(1169.9 *32*)	3234.06		0.00223 *17*	6.55 *4*	0.00223 *17*	εK=0.8756; εL=0.1028; εM+=0.02115
(1186.8 *32*)	3217.2		4.1×10^{-4} *8*	7.30 *9*	4.1×10^{-4} *8*	εK=0.8755; εL=0.1028; εM+=0.021135 *3*
(1196.9 *32*)	3207.1		4.8×10^{-4} *8*	7.23 *8*	4.8×10^{-4} *8*	εK=0.8753; εL=0.10273 *2*; εM+=0.021127 *3*
(1216.9 *32*)	3187.15	3.8×10^{-5} *3*	0.0288 *13*	5.471 *20*	0.0288 *13*	av Eβ=90.1 *13*; εK=0.8749; εL=0.10265 *2*; εM+=0.021110 *3*
(1272.7 *32*)	3131.35	3.1×10^{-6} *5*	0.00084 *13*	7.05 *7*	8.4×10^{-4} *13*	av Eβ=113.9 *13*; εK=0.8729 *2*; εL=0.10232 *3*; εM+=0.021040 *5*
(1410.6 *32*)	2993.43	8.4×10^{-6} *14*	0.00040 *7*	7.46 *8*	0.00041 *7*	av Eβ=172.4 *13*; εK=0.8585 *6*; εL=0.10044 *7*; εM+=0.02065 *2*
(1439.2 *32*)	2964.81	1.5×10^{-5} *3*	0.00055 *11*	7.34 *9*	5.6×10^{-4} *11*	av Eβ=184.5 *13*; εK=0.8532 *7*; εL=0.09979 *8*; εM+=0.02051 *2*
(1459.5 *32*)	2944.52	0.00153 *8*	0.0471 *20*	5.417 *19*	0.0486 *21*	av Eβ=193.2 *13*; εK=0.8489 *7*; εL=0.09925 *9*; εM+=0.02040 *2*
(1719.6 *32*)	2684.45	0.000405 *25*	0.00231 *14*	6.87 *3*	0.00271 *16*	av Eβ=304.3 *13*; εK=0.7459 *17*; εL=0.08698 *20*; εM+=0.01787 *4*
(1728.0 *32*)	2676.0	0.000161 *22*	0.00088 *12*	7.29 *6*	0.00104 *14*	av Eβ=308.0 *13*; εK=0.7411 *18*; εL=0.08642 *21*; εM+=0.01776 *5*

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^{82}Rb $\varepsilon+\beta^{+}$ decay (1.2575 min) 2016Ni03,1983Me08 (continued)

ϵ,β^{+} radiations (continued)

E(decay)	E(level)	Iβ^{+} ‡	Iε‡	Log *ft*	I($\varepsilon+\beta^{+}$)†‡	Comments
(1748.0 *32*)	2655.96	0.00247 *12*	0.0122 *6*	6.160 *21*	0.0147 *7*	av Eβ=316.6 *13*; εK=0.7296 *18*; εL=0.08507 *21*; εM+=0.01748 *5*
(1856.5 *32*)	2547.468	4.×10^{-5} *3*	0.00011 *11*	8.2 *4*	0.00015 *14*	av Eβ=363.6 *13*; εK=0.6614 *20*; εL=0.07705 *24*; εM+=0.01583 *5*
(1923.9 *32*)	2480.06	0.0298 *12*	0.070 *3*	5.485 *18*	0.100 *4*	av Eβ=393.0 *14*; εK=0.6158 *21*; εL=0.07170 *25*; εM+=0.01473 *5*
(1953.8 *32*)	2450.19	0.00488 *20*	0.0103 *4*	6.331 *18*	0.0152 *6*	av Eβ=406.1 *14*; εK=0.5952 *21*; εL=0.06930 *25*; εM+=0.01424 *5*
(2232.2 *32*)	2171.81	0.32 *2*	0.28 *1*	5.010 *22*	0.60 *3*	av Eβ=529.0 *14*; εK=0.4131 *18*; εL=0.04802 *21*; εM+=0.00986 *5*
(2447.2 *32*)	1956.771	0.0026 *7*	0.0014 *4*	7.40 *12*	0.0040 *11*	av Eβ=625.3 *14*; εK=0.3022 *14*; εL=0.03509 *16*; εM+=0.00721 *4*
(2583.5 *32*)	1820.538	0.00032 *11*	0.00013 *5*	8.48 *16*	0.00045 *16*	av Eβ=686.8 *14*; εK=0.2476 *11*; εL=0.02873 *13*; εM+=0.00590 *3*
(2916.3 *32*)	1487.70	0.0416 *11*	0.00892 *24*	6.744 *12*	0.0505 *13*	av Eβ=838.7 *14*; εK=0.1550 *7*; εL=0.01796 *8*; εM+=0.003689 *15*
(2929.1 *32*)	1474.904	0.158 *5*	0.0332 *11*	6.178 *14*	0.191 *6*	av Eβ=844.6 *14*; εK=0.1523 *7*; εL=0.01766 *8*; εM+=0.003625 *15*
(3627.5 *32*)	776.523	13.0 *4*	1.05 *3*	4.863 *13*	14.1 *4*	av Eβ=1169.0 *14*; εK=0.06547 *22*; εL=0.007577 *25*; εM+=0.001555 *5*
(4404.0 *33*)	0	81.8 *4*	3.00 *3*	4.576 *3*	84.8 *4*	av Eβ=1536.0 *15*; εK=0.03108 *8*; εL=0.003593 *10*; εM+=0.0007375 *1*

† From γ-ray intensity balance.
‡ Absolute intensity per 100 decays.

$\gamma(^{82}$Kr)

Iγ normalization: as given in 2016Ni03 based on weighted average of absolute measurements of Iγ(776): 0.149 *4* (1987Ho06), 0.1512 *18* (1987Ju01), 0.1493 *37* (2012Gr03).

All data are from 2016Ni03, unless given otherwise.

E_γ	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†@]
396.93 *20*	0.0029 *5*	2944.52	2	2547.468	(3$^-$)		
523.24 *7*	0.062 *2*	2480.06	2$^+$	1956.771	(2$^+$)		
619.105[‡] *10*	0.0103 *8*	2094.018	3$^+$	1474.904	2$^+$		
659.38 *7*	0.0050 *3*	2480.06	2$^+$	1820.538	4$^+$		
696.85 *7*	0.176 *4*	2171.81	0$^+$	1474.904	2$^+$		
698.361[‡] *10*	0.95 *3*	1474.904	2$^+$	776.523	2$^+$		
699.41 *13*	0.0042 *6*	2655.96	2$^+$	1956.771	(2$^+$)		
711.09 *7*	0.358 *8*	1487.70	0$^+$	776.523	2$^+$		
754.03 *16*	0.0050 *6*	3234.06	(0$^+$)	2480.06	2$^+$		
776.511[‡] *10*	100.0 *20*	776.523	2$^+$	0	0$^+$	Q	
805.76 *7*	0.0043 *4*	3285.81		2480.06	2$^+$		
850.37 *7*	0.0026 *2*	2944.52	2	2094.018	3$^+$		
908.85 *22*	0.004 *1*	3565.12	(0)$^+$	2655.96	2$^+$		
975.22 *7*	0.056 *2*	2450.19	0$^+$	1474.904	2$^+$		
987.60 *21*	0.0031 *5*	2944.52	2	1956.771	(2$^+$)		
992.27 *9*	0.0139 *4*	2480.06	2$^+$	1487.70	0$^+$		
1044.005[‡] *10*	0.008 *1*	1820.538	4$^+$	776.523	2$^+$		
1072.554[‡] *10*	0.0081 *7*	2547.468	(3$^-$)	1474.904	2$^+$		
1085.08 *11*	0.0032 *4*	3565.12	(0)$^+$	2480.06	2$^+$		
1113.71 *15*	0.0007 *2*	3285.81		2171.81	0$^+$		
1168.23 *7*	0.0060 *3*	2655.96	2$^+$	1487.70	0$^+$		
1168.40 *8*	0.0032 *2*	3716.15	(2$^+$)	2547.468	(3$^-$)		
1180.209[‡] *24*	0.112 *6*	1956.771	(2$^+$)	776.523	2$^+$	D+Q	−0.52 *16*
1181.05 *7*	0.0091 *8*	2655.96	2$^+$	1474.904	2$^+$		
1191.61 *18*	0.0048 *3*	3285.81		2094.018	3$^+$		
1195.72 *16*	0.0010 *1*	3742.76		2547.468	(3$^-$)		
1230.35 *7*	0.0134 *7*	3187.15	(0)$^+$	1956.771	(2$^+$)		
1276.93 *19*	0.0048 *8*	3234.06	(0$^+$)	1956.771	(2$^+$)		
1317.485[‡] *10*	0.0063 *7*	2094.018	3$^+$	776.523	2$^+$		
1395.26 *7*	3.81 *19*	2171.81	0$^+$	776.523	2$^+$	Q	
1399.31 *23*	0.0010 *2*	3355.99	1,2$^{(+)}$	1956.771	(2$^+$)		
1400.82 *10*	0.0039 *5*	3881.00	1,2$^{(+)}$	2480.06	2$^+$		
1469.64 *9*	0.016 *1*	2944.52	2	1474.904	2$^+$		

From ENSDF

γ(^{82}Kr) (continued)

E_γ	I_γ[&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	δ[†@]	$I_{(\gamma+ce)}$[a]	Comments
1474.895[‡] *10*	0.63 *2*	1474.904	2^+	0	0^+	Q			
1488[#]		1487.70	0^+	0	0^+	E0		6.2×10^{-6} *6*	K/K+L+=0.76$L/K+L+=0.07. ce(K)(1488$\gamma$)/ce(K)(1475$\gamma$)=0.31 *3*; ce(K)(1488$\gamma$)=$4.7\times10^{-6}$ *5* per 100 ^{82}Rb decays (1985Ze03).
1570.88 *15*	0.0014 *2*	3742.76		2171.81	0^+				
1608.21 *7*	0.0194 *10*	3565.12	$(0)^+$	1956.771	(2^+)	Q			
1621.99 *13*	0.0020 *2*	3716.15	(2^+)	2094.018	3^+				
1648.76 *23*	0.0022 *3*	3742.76		2094.018	3^+				
1656.47 *22*	0.0021 *5*	3131.35		1474.904	2^+				
1673.70 *7*	0.045 *3*	2450.19	0^+	776.523	2^+				
1703.54 *7*	0.36 *2*	2480.06	2^+	776.523	2^+	D+Q	1.03 *10*		
1712.24 *7*	0.013 *1*	3187.15	$(0)^+$	1474.904	2^+				
1741.73 *18*	0.0039 *3*	3836.13	1,2	2094.018	3^+				
1742.23 *30*	0.0027 *5*	3217.2		1474.904	2^+				
1759.25 *25*	0.0026 *4*	3716.15	(2^+)	1956.771	(2^+)				
1785.85 *7*	0.018 *1*	3742.76		1956.771	(2^+)				
1786.7 *3*	0.0017 *2*	3881.00	$1,2^{(+)}$	2094.018	3^+				
1879.61 *7*	0.068 *4*	2655.96	2^+	776.523	2^+	D+Q	−0.71 *21*		
1899.5 *3*	0.0069 *9*	2676.0		776.523	2^+				
1907.90 *12*	0.018 *1*	2684.45		776.523	2^+				
1956.740[‡] *21*	0.043 *2*	1956.771	(2^+)	0	0^+	Q			
1963.21 *20*	0.0020 *5*	3438.15		1474.904	2^+				
2090.00 *29*	0.0044 *7*	3565.12	$(0)^+$	1474.904	2^+				
2168.06 *7*	0.262 *13*	2944.52	2	776.523	2^+	D+Q	<0.06		
2172[#]		2171.81	0^+	0	0^+	E0		5×10^{-5} *1*	ce(K)/(γ+ce)=0.3; ce(L)/(γ+ce)=0.03 ce(K)(2172γ)/ce(K)(2168γ)=4.1 *10*; ce(K)(2172γ)=1.4×10^{-5} *3* per 100 ^{82}Rb decays (1985Ze03).
2188.26 *16*	0.0037 *7*	2964.81		776.523	2^+				
2217.7 *3*	0.0010 *4*	2993.43		776.523	2^+				
2255.02 *31*	0.0026 *3*	3742.76		1487.70	0^+				
2268.24 *21*	0.0041 *7*	3742.76		1474.904	2^+				
2354.73 *24*	0.0035 *7*	3131.35		776.523	2^+				
2360.96 *21*	0.0042 *7*	3836.13	1,2	1474.904	2^+				
2405.95 *13*	0.0009 *2*	3881.00	$1,2^{(+)}$	1474.904	2^+				
2410.65 *17*	0.165 *8*	3187.15	$(0)^+$	776.523	2^+	Q			
2430.5 *3*	0.0032 *5*	3207.1		776.523	2^+				
2457.69 *15*	0.0050 *5*	3234.06	(0^+)	776.523	2^+	Q			
2480.23 *7*	0.24 *1*	2480.06	2^+	0	0^+				
2509.31 *7*	0.0171 *9*	3285.81		776.523	2^+				
2579.18 *11*	0.0063 *5*	3355.99	$1,2^{(+)}$	776.523	2^+				

γ(^{82}Kr) (continued)

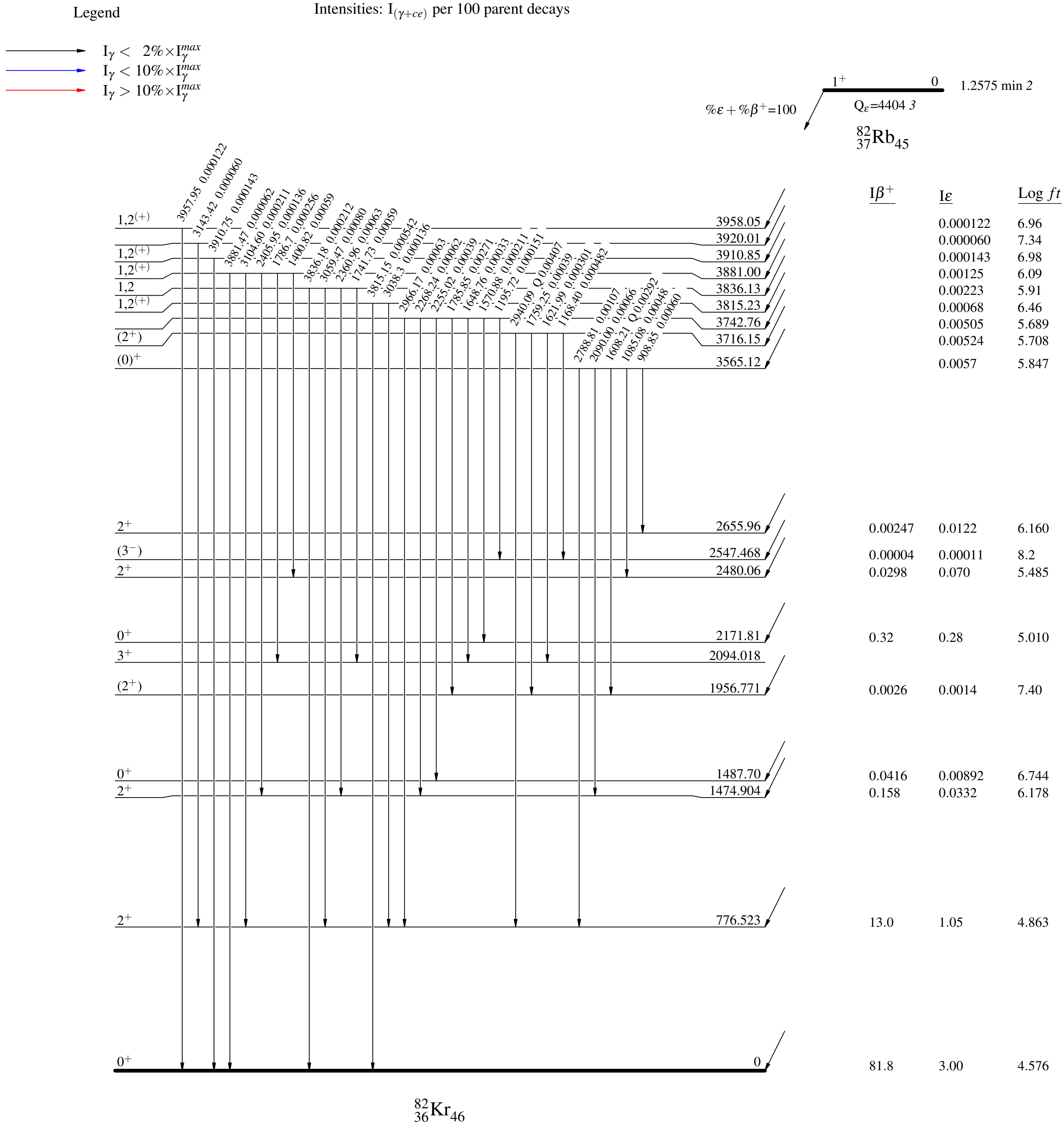
E_γ	I_γ[&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]
2655.56 *8*	0.0141 *3*	2655.96	2^+	0	0^+	
2661.58 *14*	0.0046 *4*	3438.15		776.523	2^+	
2681.5 *4*	0.0019 *4*	3457.21	$1,2^{(+)}$	776.523	2^+	
2788.81 *9*	0.0071 *5*	3565.12	$(0)^+$	776.523	2^+	
2940.09 *10*	0.027 *1*	3716.15	(2^+)	776.523	2^+	Q
2944.61 *12*	0.0358 *18*	2944.52	2	0	0^+	
2966.17 *14*	0.0042 *4*	3742.76		776.523	2^+	
2992.97 *21*	0.0017 *2*	2993.43		0	0^+	
3038.3 *4*	0.0009 *2*	3815.23	$1,2^{(+)}$	776.523	2^+	
3059.47 *12*	0.0053 *4*	3836.13	1,2	776.523	2^+	
3104.60 *23*	0.0014 *2*	3881.00	$1,2^{(+)}$	776.523	2^+	
3143.42 *24*	0.0004 *1*	3920.01		776.523	2^+	
3356.09 *10*	0.0019 *1*	3355.99	$1,2^{(+)}$	0	0^+	
3457.03 *14*	0.00089 *5*	3457.21	$1,2^{(+)}$	0	0^+	
3815.15 *7*	0.0036 *1*	3815.23	$1,2^{(+)}$	0	0^+	
3836.18 *8*	0.00141 *8*	3836.13	1,2	0	0^+	
3881.47 *19*	0.00041 *5*	3881.00	$1,2^{(+)}$	0	0^+	
3910.75 *12*	0.00095 *7*	3910.85	$1,2^{(+)}$	0	0^+	
3957.95 *14*	0.00081 *6*	3958.05	$1,2^{(+)}$	0	0^+	

[†] From $\gamma\gamma(\theta)$ in 2016Ni03.
[‡] Value from 2011Kr06 in 82Br β^- decay.
[#] From E(level).
[@] If no value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
[&] For absolute intensity per 100 decays, multiply by 0.1506 *15*.
[a] Absolute intensity per 100 decays.

^{82}Rb ε decay (1.2575 min) 2016Ni03,1983Me08

Decay Scheme

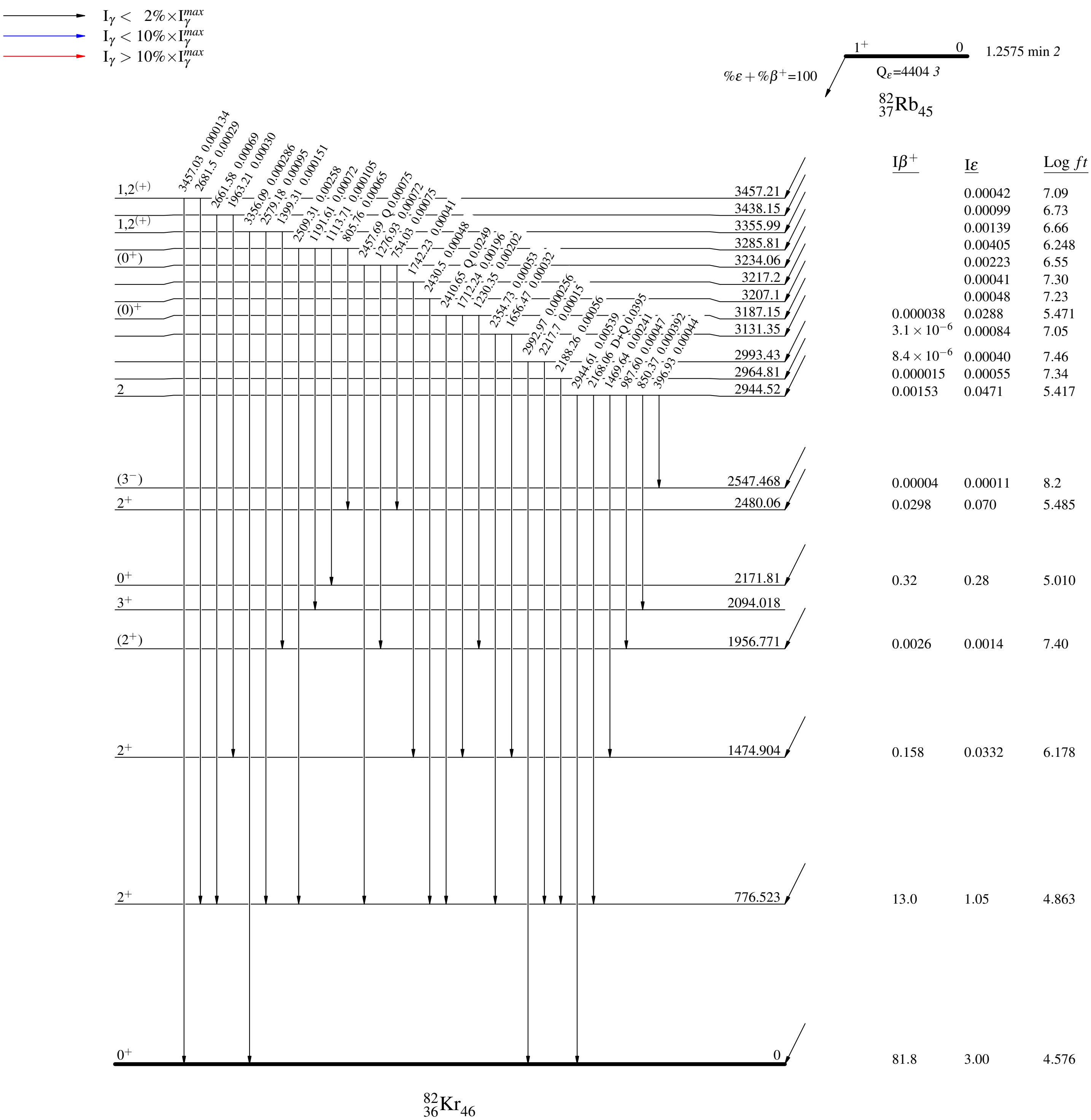
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{82}Rb ε decay (1.2575 min) 2016Ni03,1983Me08

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{82}Rb ε decay (1.2575 min) 2016Ni03,1983Me08

Decay Scheme (continued)

Legend

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays