

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, A. Luca, S. Juutinen, and B. Singh		NDS 110,2815 (2009)	30-Sep-2009

$Q(\beta^-) = -2680.4$ 22; $S(n) = 10520.6$ 3; $S(p) = 10715$ 4; $Q(\alpha) = -7104.8$ 13 [2012Wa38](#)

Note: Current evaluation has used the following Q record -2686.3 2710520.6 3 10722 5 -7104.4 15 [2009AuZZ](#).

Values in [2003Au03](#) are: $Q(\beta^-) = -2681.0$ 23, $S(n) = 10520.6$ 3, $S(p) = 10711$ 4, $Q(\alpha) = -7096$ 3.

^{84}Kr evaluated by J.K. Tuli, A. Luca, S. Juutinen, and B. Singh.

Theory/calculations:

[2009Tu04](#): quadrupole moment and $B(E2)$ (IBA model).

[1995La07](#): relativistic mean-field theory).

[1995De02](#), [1990Zo02](#), [1987Ha21](#), [1984Er02](#): interacting-boson model.

[1991Jo03](#): description of 8^+ states.

[1989Co02](#): octupole bands.

[1988Er07](#): calculated levels.

[1988Pe04](#): microscopic boson expansion model.

[1987Ha21](#): quadrupole moment, dynamic deformation model [1982Ah06](#): quadrupole moment, projected Hartree-Fock model.

Isotope shift and nuclear charge radius:

[1987Ha21](#): dynamic deformation model.

[1986Di06](#): two-hole cluster-phonon coupling model.

[1982Br01](#): monopole and quadrupole pairing vibration model.

[1981Bu06](#): liquid drop plus Strutinsky shell corrections plus pairing.

Reduced transition probabilities: [1982Ah06](#) (projected Hartree-Fock model) [1995Zh26](#), [1992Er02](#) (systematics), [1995La07](#),

[1992Sc19](#), [1992Ne09](#), [1992Li24](#), [1989Tr04](#), [1984Lo06](#), [1980Ca23](#), [1975So06](#).

First-unique forbidden β decay matrix elements for ^{84}Br and ^{84}Rb decays: [1986Ci02](#), [1972Ej01](#).

Other experiments:

Recent atomic mass measurements using Penning-trap systems: [2009Re03](#) (supersedes [2005Sh38](#)), [2006De36](#), [2006Ri15](#) (also [2005Sc26](#)).

Measurements of isotope shift and nuclear charge radius: [1995Ke04](#), [1990Sc30](#), [1990Ca26](#), [1989Tr04](#), [1981Ge06](#), [1979Ge06](#), [1977Ge05](#).

Five neutron resonances from 28.05 eV to 1100 eV are known according [2006MuZX](#) evaluation, see $^{83}\text{Kr}(n,\gamma)$:resonances dataset.

 ^{84}Kr LevelsCross Reference (XREF) Flags

A	^{84}Br β^- decay (31.76 min)	E	$^{83}\text{Kr}(n,\gamma)$ E=thermal
B	^{84}Br β^- decay (6.0 min)	F	$^{84}\text{Kr}(p,p')$
C	^{84}Rb ε decay	G	Coulomb excitation
D	$^{82}\text{Se}(\alpha,2n\gamma)$	H	(HI,xn γ)

E(level) [†]	J π [#]	T _{1/2} [‡]	XREF	Comments
0.0 [@]	0 ⁺	stable	ABCDEFGH	$\langle r^2 \rangle^{1/2} = 4.1882$ fm 14 (2004An14 evaluation). J $^\pi$: hyperfine structure measurement (1933Ko02) consistent with J=0. $\Delta\langle r^2 \rangle(^{86}\text{Kr}-^{84}\text{Kr}) = +0.042$ 12 fm ² from isotope shift (1995Ke04). Others: +0.033 22 (1990Sc30 , 1979Ge06). $\mu = +0.534$ 26 (2001Me20 , 2005St24) J $^\pi$: L(p,p')=2. μ : from g=+0.267 13 (2001Me20 , transient-field technique). T _{1/2} : From 2001Me20 , DSA in Coul ex. Other: 4.35 ps 18 from B(E2)=0.122 5
881.615 [@] 3	2 ⁺	4.05 ps 13	ABCDEFGH	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{84}Kr Levels (continued)

E(level) [†]	J ^π #	T _{1/2} [‡]	XREF	Comments
				measured in Coulomb excitation (1982Ke01); 3.2 ps <i>14</i> from recoil-distance in ($\alpha,2n\gamma$). 2001Ra27 evaluation gives adopted half-life=4.26 ps 20 and B(E2)($\uparrow$)=0.125 6.
1837.3 20	0 ⁺	25 ps <i>10</i>	A D FG	J ^π : L(p,p')=0.
1897.783 & 10	2 ⁺	0.24 ps 5	ABCDEF	J ^π : E2 γ to 0 ⁺ . T _{1/2} : From 2001Me20 , DSA in Coul ex. Others: 0.30 ps +7-3 from ($\alpha,2n\gamma$).
2095.00 @ 7	4 ⁺	0.66 ps <i>13</i>	A DEFGH	T _{1/2} : From 2001Me20 , DSA in Coul ex. Others: 0.45 ps +5-7 from ($\alpha,2n\gamma$).
2345.46 & 7	4 ⁺	24 ps 3	AB DEFG	J ^π : L(p,p')=4.
				1987Ha21 , from their (n, γ) study, propose that the 446.9 γ and 1463.8 γ deexcite two levels at 2344.3 keV and 2345.6 keV. The 2344.3 is assigned 3 ⁺ on the basis of systematics. These conclusions are not adopted by the evaluators since (1) the intensity ratios I γ (446.9)/I γ (1463.8) are nearly the same in (n, γ), β^- decay (31.76 min), and β^- decay (6.0 min), and (2) log ft=7.0, log f ^{Au} t=8.3 for β^- decay from (5 ⁻ ,6 ⁻) would limit J=4 to 7.
2489.2 4	(2 ⁺ ,3 ⁻)		A	J ^π : probable γ to 4 ⁺ . γ from 1 ⁻ .
2622.98 17	2 ⁺	0.28 ps <i>14</i>	A DEF	J ^π : uniquely determined by $\gamma\gamma(\theta)$ in β^- decay. M1+E2 γ to 2 ⁺ .
2700.28 8	3 ⁻	1.7 ps +14-11	A DEF	J ^π : L(p,p')=3. B(E3)($\uparrow$)=0.042 <i>15</i> (2002Ki06 evaluation, data from 1978Ma11 , 1974Ar29). Deduced B(E3)(W.u.)=14 5.
2759.28 13	2 ⁺		A E	J ^π : log ft=7.5 from 2 ⁻ , γ to 0 ⁺ , (M1+E2) γ to 2 ⁺ , $\gamma\gamma(\theta)$.
2770.94 ^a 9	5 ⁻	7.6 ps <i>21</i>	B DE	J ^π : stretched E1 to 4 ⁺ .
2775 20	2 ⁺		F	J ^π : L(p,p')=2.
2861.09 8	(2 ⁺ ,3,4 ⁺)		E	J ^π : γ 's to 2 ⁺ and 4 ⁺ .
3042.11 7	(2 ⁺ ,3,4 ⁺)		DEF	J ^π : γ 's to 2 ⁺ and 4 ⁺ .
3082.38 8	3		A E	J ^π : log ft=6.6, log f ^{Au} t=7.6 from 2 ⁻ . J=1,2 excluded by $\gamma\gamma(\theta)$ in β^- decay.
3172.55 @ 16	6 ⁺	2.6 ps 7	DE H	J ^π : stretched E2 indicated by $\gamma(\theta)$ in ($\alpha,2n\gamma$).
3183.29 25	(2 ⁺ ,3,4 ⁺)		E	J ^π : γ 's to 2 ⁺ and 4 ⁺ .
3219.35 ^b 11	5 ⁻	17 ps 4	DE	J ^π : from $\gamma(\theta)$, linear pol in ($\alpha,2n\gamma$), 1124 γ is stretched E1, 448 γ is M1 with $\Delta J=0$.
3225 20	(1 ⁻)		F	J ^π : L(p,p')=(1).
3236.07 @ 18	8 ⁺	1.83 μ s 4	D H	%IT=100 $\mu=-1.968$ <i>16</i> (1982Za04 , 1989Ra17) Q=0.36 4 (2006Sc22) J ^π : E2 γ to 6 ⁺ in ($\alpha,2n\gamma$). Configuration=(ν g _{9/2}) ⁻² . μ : TDPAD method in ($\alpha,2n\gamma$) (1982Za04). See also 2005St24 compilation. Q: from level-mixing spectroscopy (LEMS) technique (2006Sc22) using Q(^{79}Kr , 5/2 ⁻)=0.456 26 as reference value. T _{1/2} : from 2006Sc22 . Others: 1.89 μ s 4 from time-differential perturbed angular distribution observed in ($\alpha,2n\gamma$); 1.4 μ s 4 (1997Is13) based on particle- γ - γ measurement in $^{76}\text{Ge}+^{198}\text{Pt}$ reaction.
3288.68 12	5 ⁺	0.31 ps <i>10</i>	DE	J ^π : stretched E1 transition from 6 ⁻ , linear polarization of M1+E2 943 γ to 4 ⁺ .
3312.39 13	(3 ⁻)		E	J ^π : J=3 preferred from $\gamma\gamma(\theta)$ in (n, γ), but other J values are not definitely excluded. M1+E2 γ to 3 ⁻ .
3335? 20			F	Possibly identical to 3312 level.
3365.88 20	(1,2 ⁺)		A	J ^π : γ to 0 ⁺ .
3408.15 11	(3 ⁻ ,4,5 ⁻)		E	J ^π : γ 's to 3 ⁻ and 5 ⁻ .

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{84}Kr Levels (continued)

E(level) [†]	J ^π #	T _{1/2} [‡]	XREF	Comments
3426.74 12	(2 ⁺ ,3,4 ⁺)		E	J ^π : γ's to 2 ⁺ and 4 ⁺ .
3463.0 5			E	
3475.75 21	(1 ⁻)		A F	J ^π : L(p,p')=(1).
3570 20	(3 ⁻)		F	J ^π : L(p,p')=(3).
3587.12 ^b 11	6 ⁻	5.5 ps 14	DE	J ^π : deexcites by M1+E2 to 5 ⁻ , fed by M1+E2 from 7 ⁻ .
3638.50 10	(5 ⁻)	0.69 ps +28-21	DEF	J ^π : L(p,p')=(5). γ's to 3 ⁻ and 5 ⁻ .
3651.61 ^a 18	7 ⁻		D	J ^π : 180γ from 3832, 7 ⁻ level is ΔJ=0, M1+E2 from γ(θ), linear pol in (α,2nγ).
3705.87 19	1 ⁽⁻⁾ ,2,3 ⁽⁻⁾		A	J ^π : log ft=6.0, log f ^{1u} t=6.5 from 2 ⁻ . γ's to (1 ⁻) and 3 ⁻ .
3718.22 22	(3 ⁻)		EF	J ^π : L(p,p')=(3).
3777.0 3			EF	
3831.62 ^b 12	7 ⁻	4.9 ps 21	D	J ^π : stretched E2 to 5 ⁻ , E1 to 6 ⁺ , excit.
3870.1 5	1,2,3		A	J ^π : log ft=6.9, log f ^{1u} t=7.2 from 2 ⁻ .
3878.8 3	(2 ⁺ ,3)		A	J ^π : log ft=6.6, log f ^{1u} t=7.0 from 2 ⁻ . γ to 4 ⁺ .
3927.33 22	1 ⁻		A F	J ^π : log ft=4.9 from 2 ⁻ . Strong γ to 0 ⁺ .
3951.23 ^{&} 16	6 ⁺	0.9 ps 5	D	J ^π : cascades to 4 ⁺ via stretched Q.
4001.82 11	(4 ⁻)	0.35 ps 10	DEF	
4084.3 5	(1,2 ⁺)		A F	J ^π : γ to 0 ⁺ .
4116.8 5	1 ⁻ ,2 ⁻		A	J ^π : log ft=5.2 from 2 ⁻ . Weak γ to 0 ⁺ .
4189.2 5	(2 ⁺ ,3)		A F	XREF: F(4157).
				J ^π : log ft=6.0, log f ^{1u} t=6.0 from 2 ⁻ . γ to 4 ⁺ .
4214.43 13			E	
4238.5 6			E	
4278.3 5			E	
4350.12 23	(5 ⁻)	0.28 ps +14-7	D	
4388.20 ^b 19	8 ⁻	6.7 ps 17	D	J ^π : M1+E2 γ to 7 ⁻ .
4407.8 4	(6 ⁻)	0.31 ps 14	D	
4455.6 4			E	
4594.8 5			E	
4676.62 19			EF	XREF: F(4707).
4707 20			F	
4718.54 ^{&} 16	8 ⁺	5.5 ps 21	D	J ^π : cascades to 4 ⁺ via two Q γ's.
4852.25 ^a 21	9 ⁻	0.8 ps 4	D	J ^π : stretched E2 to 7 ⁻ , excit, 1616γ is stretched d.
4898 20			F	
4928.99 ^b 22	(9 ⁻)	0.55 ps 21	D	
4976.1 11	(9 ⁺)		D	
5204.1 [@] 3	10 ⁺	0.14 ps 4	D H	J ^π : stretched E2 cascade indicated by γ(θ) and linear polarization in (α,2nγ).
5358 20			F	
5373.4 [@] 4	12 ⁺	43.7 ns 21	D H	%IT=100 μ=+2.04 24 (1990Ro10,1985Ro22) μ: from TDPAD method in (α,2nγ) (1990Ro10,1985Ro22). See also 2005St24 and 1989Ra17 compilations. J ^π : stretched E2 cascade indicated by γ(θ) and linear polarization in (α,2nγ). T _{1/2} : from α,γ(t) in (α,2nγ). J ^π : stretched E2 to 8 ⁺ .
5448.75 ^{&} 19	10 ⁺	3.5 ps 14	D	
5466			F	
5640.70 ^b 24	(10 ⁻)	0.49 ps 21	D	
5901.7 ^a 3	11 ⁻	1.9 ps 6	D	J ^π : stretched E2 to 9 ⁻ .
6067.4 11			D	
6472.2 4			D	
6572.1 4	(12 ⁻)	0.42 ps 14	D	J ^π : E1 γ to 12 ⁺ consistent with ΔJ=0.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{84}Kr Levels (continued)

E(level) [†]	J ^π [#]	T _{1/2} [‡]	XREF	Comments
6590.3 6			D	
7015.8 4	(13) ⁻	0.17 ps 7	D	J ^π : stretched M1 to (12) ⁻ .
7653.2 5	(14 ⁻)	0.28 ps 7	D	J ^π : cascades via stretched d.
(10520.6 3)	4 ⁺ ,5 ⁺		E	E(level),J ^π : thermal neutron-capture state by 9/2 ⁺ target. S(n) from 2009AuZZ,2003Au03 .

[†] From least-squares fit to adopted gammas if γ decay is observed. Other level energies are from (p,p').

[‡] From Doppler-shift attenuation and recoil-distance technique in ($\alpha,2n\gamma$), unless indicated otherwise.

[#] J^π for the levels seen in ($\alpha,2n\gamma$) are based upon $\gamma(\theta)$, excit, multipolarity of transitions.

@ Band(A): Sequence based on ground state.

& Band(B): Sequence based on 1898, 2⁺.

^a Band(C): $\pi=-$, $\Delta J=2$ sequence.

^b Band(D): $\pi=-$, $\Delta J=1$ sequence.

Adopted Levels, Gammas (continued)

$\gamma(^{84}\text{Kr})$									
$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	I_γ	E_f	J_f^π	Mult.#	$\delta^@$	$\alpha^\dagger$	Comments
881.615	2 ⁺	881.610 3	100	0.0	0 ⁺	[E2]			B(E2)(W.u.)=12.0 4
1837.3	0 ⁺	955.7 20	100	881.615	2 ⁺				E_γ : 950.0 2 in (α ,2n γ).
1897.783	2 ⁺	1016.162 13	47.1 16	881.615	2 ⁺	M1+E2	0.84 7		B(M1)(W.u.)=0.016 4; B(E2)(W.u.)=13 3
		1897.761 14	100.0	0.0	0 ⁺	E2			B(E2)(W.u.)=3.0 7
2095.00	4 ⁺	1213.39 10	100	881.615	2 ⁺	E2			B(E2)(W.u.)=15 3
2345.46	4 ⁺	446.9 3	2.73 19	1897.783	2 ⁺	[E2]		0.00453 7	B(E2)(W.u.)=1.61 23
									$\alpha(\text{K})=0.00400$ 6; $\alpha(\text{L})=0.000446$ 7; $\alpha(\text{M})=7.21\times 10^{-5}$
									11; $\alpha(\text{N}+..)=7.15\times 10^{-6}$ 11
									$\alpha(\text{N})=7.15\times 10^{-6}$ 11
									B(E2)(W.u.)=0.156 20
2489.2	(2 ⁺ ,3 ⁻)	1463.84 9	100.0 12	881.615	2 ⁺	E2			
		394.1 & 7		2095.00	4 ⁺				
		1607.6 4		881.615	2 ⁺				
2622.98	2 ⁺	1741.3 2	100 4	881.615	2 ⁺	M1+E2	-1.5 +5-10		B(M1)(W.u.)=0.004 3; B(E2)(W.u.)=3.4 19
									Mult.: the large mixing ratio excludes E1+M2.
2700.28	3 ⁻	2622.7 4	18 3	0.0	0 ⁺				
		354.7 2	4.9 5	2345.46	4 ⁺				
		605.1 3	26.6 15	2095.00	4 ⁺	(E1+M2)	+0.025 23		B(E1)(W.u.)=(0.00018 +12-16); B(M2)(W.u.)=(1
									+3-1)
		802.56 14	100.0 15	1897.783	2 ⁺	E1			B(E1)(W.u.)=0.00030 +20-25
		1818.7 4	4.0 6	881.615	2 ⁺				
2759.28	2 ⁺	1877.80 14	100	881.615	2 ⁺	(M1+E2)	-0.10 8		
		2758.4 3	53 13	0.0	0 ⁺				
2770.94	5 ⁻	425.30 11	100	2345.46	4 ⁺	E1		0.001458 21	B(E1)(W.u.)=0.00060 17
									$\alpha(\text{K})=0.001295$ 19; $\alpha(\text{L})=0.0001376$ 20;
									$\alpha(\text{M})=2.22\times 10^{-5}$ 4; $\alpha(\text{N}+..)=2.23\times 10^{-6}$
									$\alpha(\text{N})=2.23\times 10^{-6}$ 4
									Mult.: M2 admixture with $\delta<0$ needed to explain
									large anisotropy for 424 γ (1992Pr06).
2861.09	(2 ⁺ ,3,4 ⁺)	765.74 25	12 8	2095.00	4 ⁺				
		963.44 13	61.5 21	1897.783	2 ⁺				
		1979.34 11	100.0 21	881.615	2 ⁺				
3042.11	(2 ⁺ ,3,4 ⁺)	946.5 5	77 3	2095.00	4 ⁺				
		2160.48 7	100.0 25	881.615	2 ⁺				
3082.38	3	382.0 2	52 7	2700.28	3 ⁻				
		736.5 3	100 12	2345.46	4 ⁺	D+Q	-0.09 3		
		987.62 17	73 6	2095.00	4 ⁺	D+Q	-0.09 4		
		1185.0 7	8.4 17	1897.783	2 ⁺				
		2200.85 11	78 3	881.615	2 ⁺				
3172.55	6 ⁺	1077.55 25	100	2095.00	4 ⁺	E2			B(E2)(W.u.)=6.9 19
									Mult.: from $\gamma(\theta)$, linear polarization and $\alpha(\text{K})\text{exp}$ in
									(α ,2n γ).

Adopted Levels, Gammas (continued)

$\gamma(^{84}\text{Kr})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	I_γ	E_f	J_f^π	Mult. [#]	$\delta^@$	$\alpha^\dagger$	Comments
3183.29	(2 ⁺ ,3,4 ⁺)	1087.8 3 2302.5 4	76 10 100 16	2095.00 881.615	4 ⁺ 2 ⁺				
3219.35	5 ⁻	448.11 11	41.6 13	2770.94	5 ⁻	M1		0.00277 4	B(M1)(W.u.)=0.0040 10 $\alpha(\text{K})=0.00245$ 4; $\alpha(\text{L})=0.000264$ 4; $\alpha(\text{M})=4.27\times 10^{-5}$ 6; $\alpha(\text{N}+..)=4.32\times 10^{-6}$ 6 $\alpha(\text{N})=4.32\times 10^{-6}$ 6
3236.07	8 ⁺	519.3 ^a 5 1124.5 2 63.5 1	9 3 100.0 15 100	2700.28 2095.00 3172.55	3 ⁻ 4 ⁺ 6 ⁺	E1 E2		4.89	B(E1)(W.u.)=9.7×10 ⁻⁶ 23 $\alpha(\text{K})=3.98$ 6; $\alpha(\text{L})=0.779$ 13; $\alpha(\text{M})=0.1262$ 20; $\alpha(\text{N}+..)=0.01078$ 17 $\alpha(\text{N})=0.01078$ 17 B(E2)(W.u.)=2.33 6 B(M1)(W.u.)=0.073 24; B(E2)(W.u.)=15 9
3288.68	5 ⁺	943.36 14	100	2345.46	4 ⁺	M1+E2	0.4 1		
3312.39	(3) ⁻	541.50 12 612.0 3	71 3 100 6	2770.94 2700.28	5 ⁻ 3 ⁻	M1+E2	+0.41 3	0.001408 22	$\alpha(\text{K})=0.001250$ 19; $\alpha(\text{L})=0.0001339$ 21; $\alpha(\text{M})=2.17\times 10^{-5}$ 4; $\alpha(\text{N}+..)=2.19\times 10^{-6}$ $\alpha(\text{N})=2.19\times 10^{-6}$ 4 Mult.: the large mixing ratio excludes E1+M2.
3365.88	(1,2 ⁺)	967.0 5 2484.1 3 3365.8 4	20 7 100 10 43 6	2345.46 881.615 0.0	4 ⁺ 2 ⁺ 0 ⁺				
3408.15	(3 ⁻ ,4,5 ⁻)	546.98 12 637.13 18 708.24 21	100 4 77 7 67 6	2861.09 2770.94 2700.28	(2 ⁺ ,3,4 ⁺) 5 ⁻ 3 ⁻				
3426.74	(2 ⁺ ,3,4 ⁺)	1331.89 13 2544.72 19	100 14 69 7	2095.00 881.615	4 ⁺ 2 ⁺				
3463.0		243.7 4	100	3219.35	5 ⁻				
3475.75	(1 ⁻)	394.1 ^{&} 7 1578.1 4 2593.7 6		3082.38 1897.783 881.615	3 2 ⁺ 2 ⁺				
3587.12	6 ⁻	298.5 1	11.7 13	3288.68	5 ⁺	E1		0.00375 6	B(E1)(W.u.)=0.00023 7 $\alpha(\text{K})=0.00333$ 5; $\alpha(\text{L})=0.000355$ 5; $\alpha(\text{M})=5.73\times 10^{-5}$ 8; $\alpha(\text{N}+..)=5.74\times 10^{-6}$ 8 $\alpha(\text{N})=5.74\times 10^{-6}$ 8
		367.6 1	100 11	3219.35	5 ⁻	M1+E2	0.24 6	0.00466 14	B(M1)(W.u.)=0.063 19; B(E2)(W.u.)=31 18 $\alpha(\text{K})=0.00413$ 12; $\alpha(\text{L})=0.000448$ 14; $\alpha(\text{M})=7.25\times 10^{-5}$ 22; $\alpha(\text{N}+..)=7.30\times 10^{-6}$ 22 $\alpha(\text{N})=7.30\times 10^{-6}$ 22
3638.50	(5 ⁻)	816.6 2 419.4 5	10 3 100.0 17	2770.94 3219.35	5 ⁻ 5 ⁻				

Adopted Levels, Gammas (continued)

 $\gamma(^{84}\text{Kr})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.#	$\delta^@$	$\alpha^\dagger$	Comments
3638.50	(5 ⁻)	938.12 13	71 3	2700.28	3 ⁻				
		1293.20 13	61 4	2345.46	4 ⁺				
		1543.27 19	77.2 26	2095.00	4 ⁺				
3651.61	7 ⁻	881.0 3	100	2770.94	5 ⁻	E2			E_γ : from E(level) difference.
3705.87	1 ⁽⁻⁾ ,2,3 ⁽⁻⁾	230.20 20	27 4	3475.75	(1 ⁻)				
		339.8 4	6.3 15	3365.88	(1,2 ⁺)				
		947.5 7	31 7	2759.28	2 ⁺				
		1005.7 7	41 11	2700.28	3 ⁻				
		1082.6 4	12.6 22	2622.98	2 ⁺				
		1807.8 8	3.7 11	1897.783	2 ⁺				
		2824.1 4	100 15	881.615	2 ⁺				
3718.22	(3 ⁻)	1623.20 20	100	2095.00	4 ⁺				
3777.0		1682.0 3	100	2095.00	4 ⁺				
3831.62	7 ⁻	180.1 2	31 5	3651.61	7 ⁻	M1+E2	-0.12 8	0.0277 20	B(M1)(W.u.)=0.09 5; B(E2)(W.u.)=5.E+1 +7-5 $\alpha(K)=0.0245$ 17; $\alpha(L)=0.00272$ 22; $\alpha(M)=0.00044$ 4; $\alpha(N+..)=4.4\times 10^{-5}$ 4 $\alpha(N)=4.4\times 10^{-5}$ 4
		244.5 1	52 5	3587.12	6 ⁻	M1+E2	0.07 3	0.01225 21	B(M1)(W.u.)=0.06 3; B(E2)(W.u.)=6 6 $\alpha(K)=0.01085$ 19; $\alpha(L)=0.001186$ 21; $\alpha(M)=0.000192$ 4; $\alpha(N+..)=1.94\times 10^{-5}$ 4 $\alpha(N)=1.94\times 10^{-5}$ 4
		612.1 2	100 14	3219.35	5 ⁻	E2		0.001760 25	B(E2)(W.u.)=25 12 $\alpha(K)=0.001559$ 22; $\alpha(L)=0.0001704$ 24; $\alpha(M)=2.76\times 10^{-5}$ 4; $\alpha(N+..)=2.75\times 10^{-6}$ $\alpha(N)=2.75\times 10^{-6}$ 4 B(E1)(W.u.)=6.E-5 3
		659.1 2	63 10	3172.55	6 ⁺	E1			
3870.1	1,2,3	394.1& 7		3475.75	(1 ⁻)				
		2988.7 7		881.615	2 ⁺				
3878.8	(2 ⁺ ,3)	1119.1 4	100 18	2759.28	2 ⁺				
		1255.5 6	32 6	2622.98	2 ⁺				
		1534.7 6	71 15	2345.46	4 ⁺				
3927.33	1 ⁻	561.4 5	1.2 3	3365.88	(1,2 ⁺)				
		1438.0 7	0.92 25	2489.2	(2 ⁺ ,3 ⁻)				
		2029.6 5	31 6	1897.783	2 ⁺				
		3045.4 4	37 6	881.615	2 ⁺				
		3927.5 4	100 10	0.0	0 ⁺				
3951.23	6 ⁺	662.6 3	≈67	3288.68	5 ⁺				
		1605.7 3	47 20	2345.46	4 ⁺				
		1856.2 3	100 27	2095.00	4 ⁺	Q			B(E2)(W.u.)=0.6 4
4001.82	(4 ⁻)	919.79 19	72 5	3082.38	3				
		1230.82 11	100 4	2770.94	5 ⁻				

Adopted Levels, Gammas (continued)

$\gamma(^{84}\text{Kr})$ (continued)									
$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	I_γ	E_f	J_f^π	Mult. #	$\delta^@$	$\alpha^\dagger$	Comments
4001.82	(4 ⁻)	1656.15 18	90 14	2345.46	4 ⁺				
4084.3	(1,2 ⁺)	3202.1 7	76 15	881.615	2 ⁺				
		4084.6 6	100 15	0.0	0 ⁺				
4116.8	1 ⁻ ,2 ⁻	2218.5 12	3.3 16	1897.783	2 ⁺				
		3235.3 5	100 16	881.615	2 ⁺				
		4115.8 15	0.19 4	0.0	0 ⁺				
4189.2	(2 ⁺ ,3)	2094.2 5	100	2095.00	4 ⁺				
4214.43		902.11 15	58 5	3312.39	(3) ⁻				
		1443.43 11	100 4	2770.94	5 ⁻				
4238.5		236.7 5	100	4001.82	(4 ⁻)				
4278.3		1507.3 5	100	2770.94	5 ⁻				
4350.12	(5 ⁻)	763.0 2	100	3587.12	6 ⁻				
4388.20	8 ⁻	556.6 2	100 12	3831.62	7 ⁻	M1+E2	0.17 4	0.00169 3	B(M1)(W.u.)=0.013 4; B(E2)(W.u.)=1.4 8 $\alpha(K)=0.001501$ 23; $\alpha(L)=0.0001606$ 25; $\alpha(M)=2.60\times 10^{-5}$ 4; $\alpha(N+..)=2.63\times 10^{-6}$ 4 $\alpha(N)=2.63\times 10^{-6}$ 4 B(E2)(W.u.)=3.7 16
4407.8	(6 ⁻)	801.1 3	46 14	3587.12	6 ⁻	E2			
4455.6		1636.8 4	100	2770.94	5 ⁻				
4594.8		1283.0 3	100	3172.55	6 ⁺				
4676.62		1823.8 5	100	2770.94	5 ⁻				
4718.54	8 ⁺	1905.65 17	100	2770.94	5 ⁻				
		767.3 2	95 15	3951.23	6 ⁺	Q			B(E2)(W.u.)=5.7 25
		886.9 2	100 15	3831.62	7 ⁻	E1			B(E1)(W.u.)=3.1 $\times 10^{-5}$ 14
		1546.0 2	100 20	3172.55	6 ⁺	Q			B(E2)(W.u.)=0.18 8
4852.25	9 ⁻	1200.7 2	100 19	3651.61	7 ⁻	E2			B(E2)(W.u.)=9 5
		1616.1 2	42 12	3236.07	8 ⁺	(E1)			Mult.: $\Delta J=1$ dipole from $\gamma(\theta)$, $\Delta\pi=\text{yes}$ from level scheme.
4928.99	(9 ⁻)	540.7 2	75 25	4388.20	8 ⁻	D+Q	0.18 5	0.00181 3	$\alpha(K)=0.00161$ 3; $\alpha(L)=0.000172$ 3; $\alpha(M)=2.79\times 10^{-5}$ 5; $\alpha(N+..)=2.82\times 10^{-6}$ 5 $\alpha(N)=2.82\times 10^{-6}$ 5 B(M1)(W.u.)=0.11 7; B(E2)(W.u.)=14 11
4976.1	(9 ⁺)	1097.3 3	≈ 100	3831.62	7 ⁻				
		1740 1	100	3236.07	8 ⁺				
5204.1	10 ⁺	1968.0 2	100	3236.07	8 ⁺	E2			B(E2)(W.u.)=6.3 18
5373.4	12 ⁺	169.3	100	5204.1	10 ⁺	E2		0.1324	$\alpha(K)=0.1153$ 17; $\alpha(L)=0.01455$ 21; $\alpha(M)=0.00235$ 4; $\alpha(N+..)=0.000223$ 4 $\alpha(N)=0.000223$ 4 B(E2)(W.u.)=3.76 22 Mult.: from $\gamma(\theta)$, linear polarization, and $\alpha(K)\text{exp}$ in $(\alpha,2n\gamma)$.
5448.75	10 ⁺	730.2 1	100	4718.54	8 ⁺	E2		0.001084 16	B(E2)(W.u.)=36 15 $\alpha(K)=0.000962$ 14; $\alpha(L)=0.0001041$ 15; $\alpha(M)=1.685\times 10^{-5}$ 24 $\alpha(N)=1.689\times 10^{-6}$ 24

Adopted Levels, Gammas (continued)

$\gamma(^{84}\text{Kr})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\ddagger$	I_γ	E_f	J_f^π	Mult. [#]	$\alpha^\dagger$	Comments
5640.70	(10 ⁻)	711.6 2	82 27	4928.99	(9 ⁻)			
		1252.6 2	100 27	4388.20	8 ⁻			
5901.7	11 ⁻	1049.4 2	100	4852.25	9 ⁻	E2		B(E2)(W.u.)=11 4
6067.4		694 1	100	5373.4	12 ⁺			
6472.2		1268.1 3	100	5204.1	10 ⁺			
6572.1	(12) ⁻	670.4 2	46 17	5901.7	11 ⁻			
		1198.6 2	100 21	5373.4	12 ⁺	E1		B(E1)(W.u.)=0.00033 15
6590.3		1141.5 5	100	5448.75	10 ⁺			
7015.8	(13) ⁻	443.7 2	100	6572.1	(12) ⁻	M1	0.00283 4	B(M1)(W.u.)=1.5 7 $\alpha(\text{K})=0.00251$ 4; $\alpha(\text{L})=0.000270$ 4; $\alpha(\text{M})=4.37\times 10^{-5}$ 7; $\alpha(\text{N}+.)=4.42\times 10^{-6}$ 7 $\alpha(\text{N})=4.42\times 10^{-6}$ 7
7653.2	(14) ⁻	637.4 3	100	7015.8	(13) ⁻	D		

[†] Additional information 1.

[‡] Most precise value from β^- decay, β^+ decay, (n, γ), (α ,2n γ), or weighted average of the most precise values.

[#] From $\gamma\gamma(\theta)$ in (n, γ) and β^- decay (31.76 min), $\gamma(\theta)$, $\alpha(\text{K})\text{exp}$, linear polarization measurements in (α ,2n γ), unless indicated otherwise.

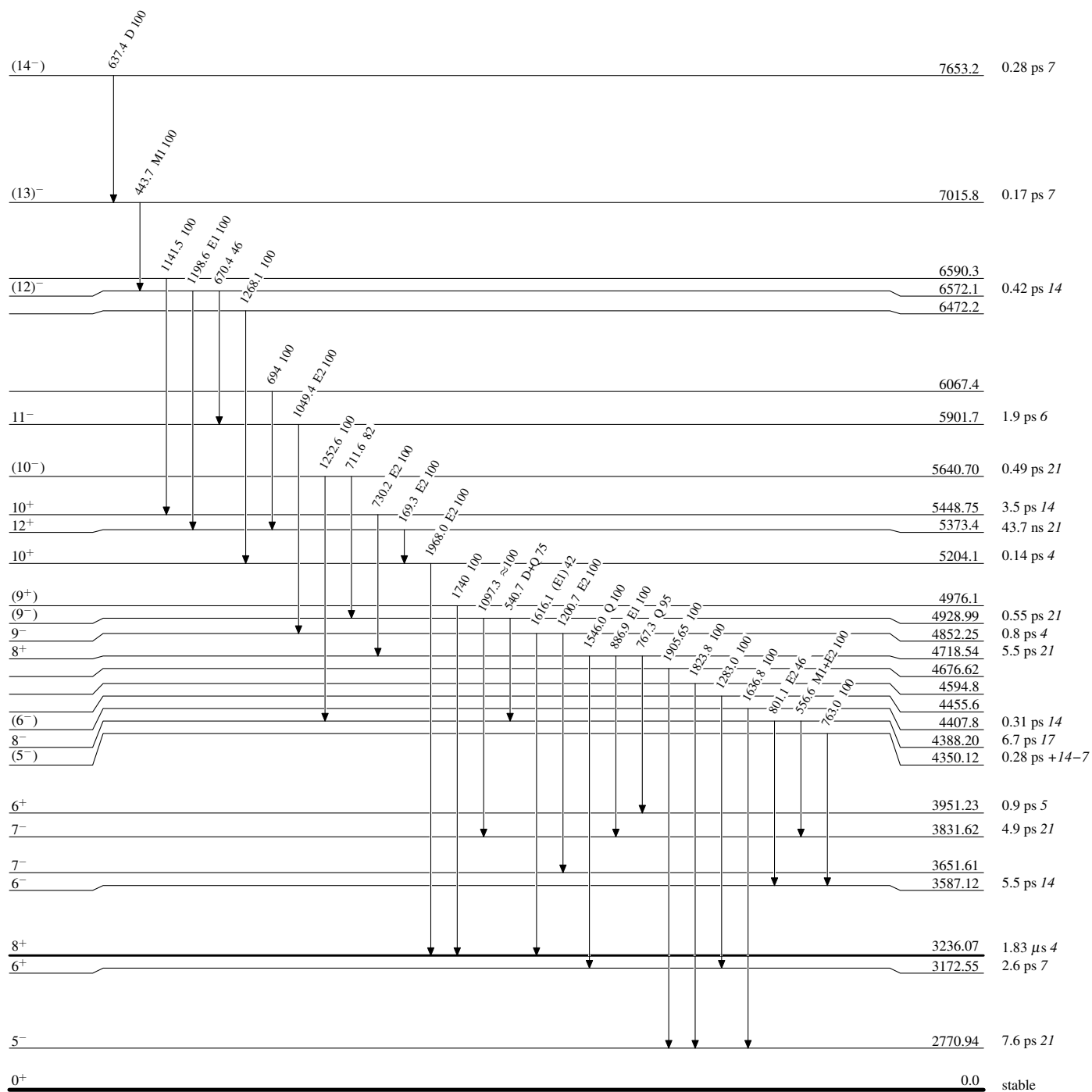
@ From $\gamma\gamma(\theta)$ observed in (n, γ) and β^- decay (31.76 min) or $\gamma(\theta)$ in (α ,2n γ).

& Multiply placed.

^a Placement of transition in the level scheme is uncertain.

Adopted Levels, GammasLevel Scheme

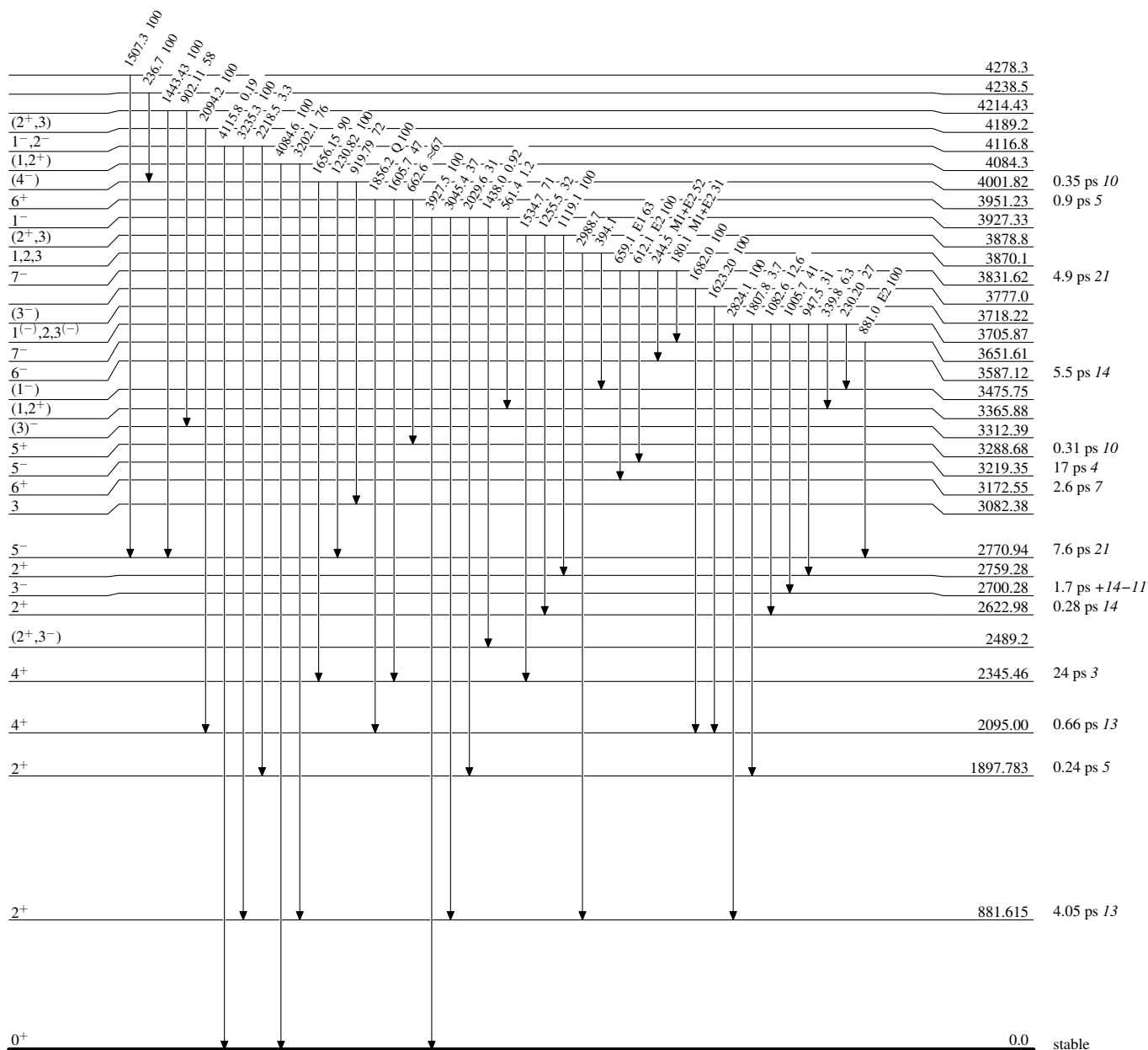
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

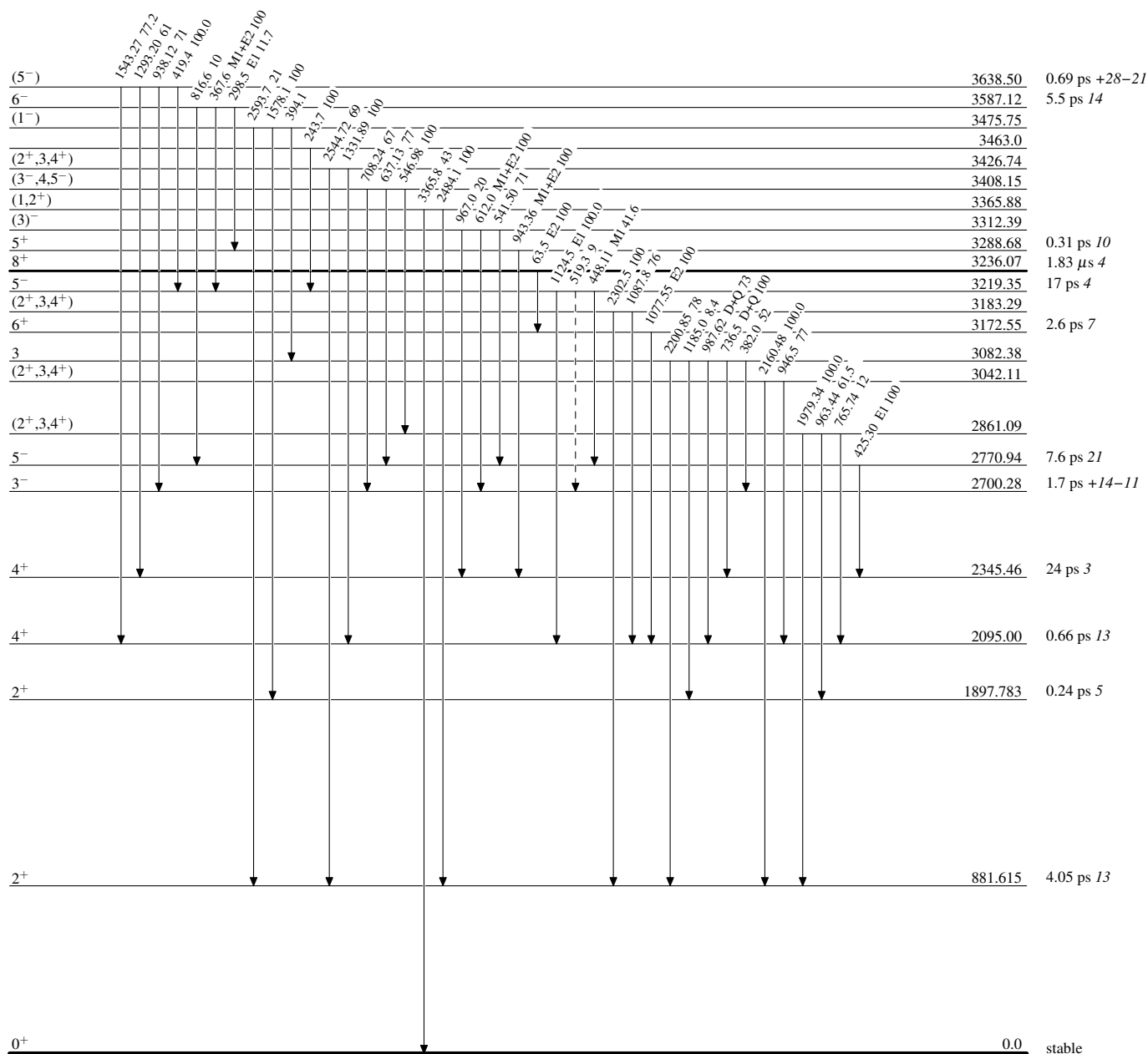


Adopted Levels, Gammas

Legend

Level Scheme (continued)

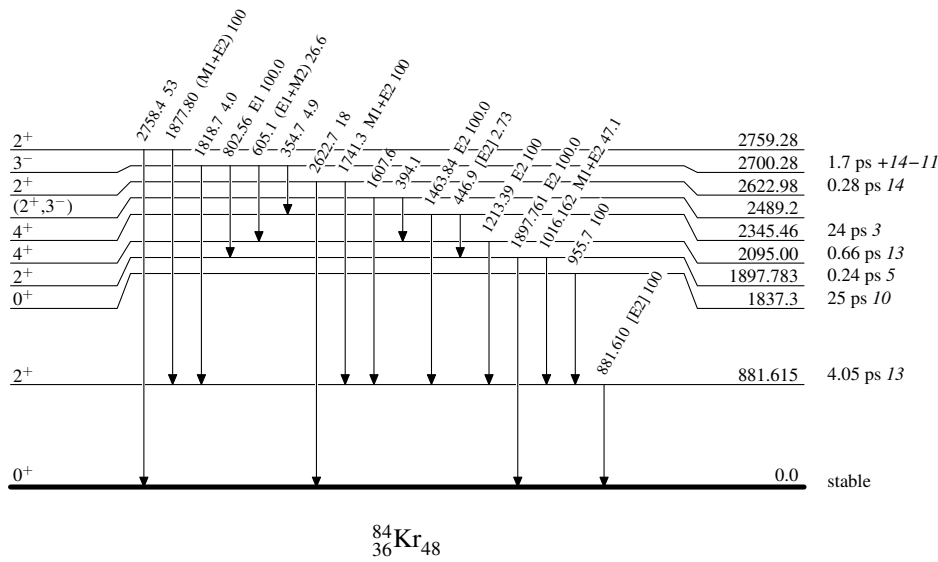
Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

Adopted Levels, Gammas

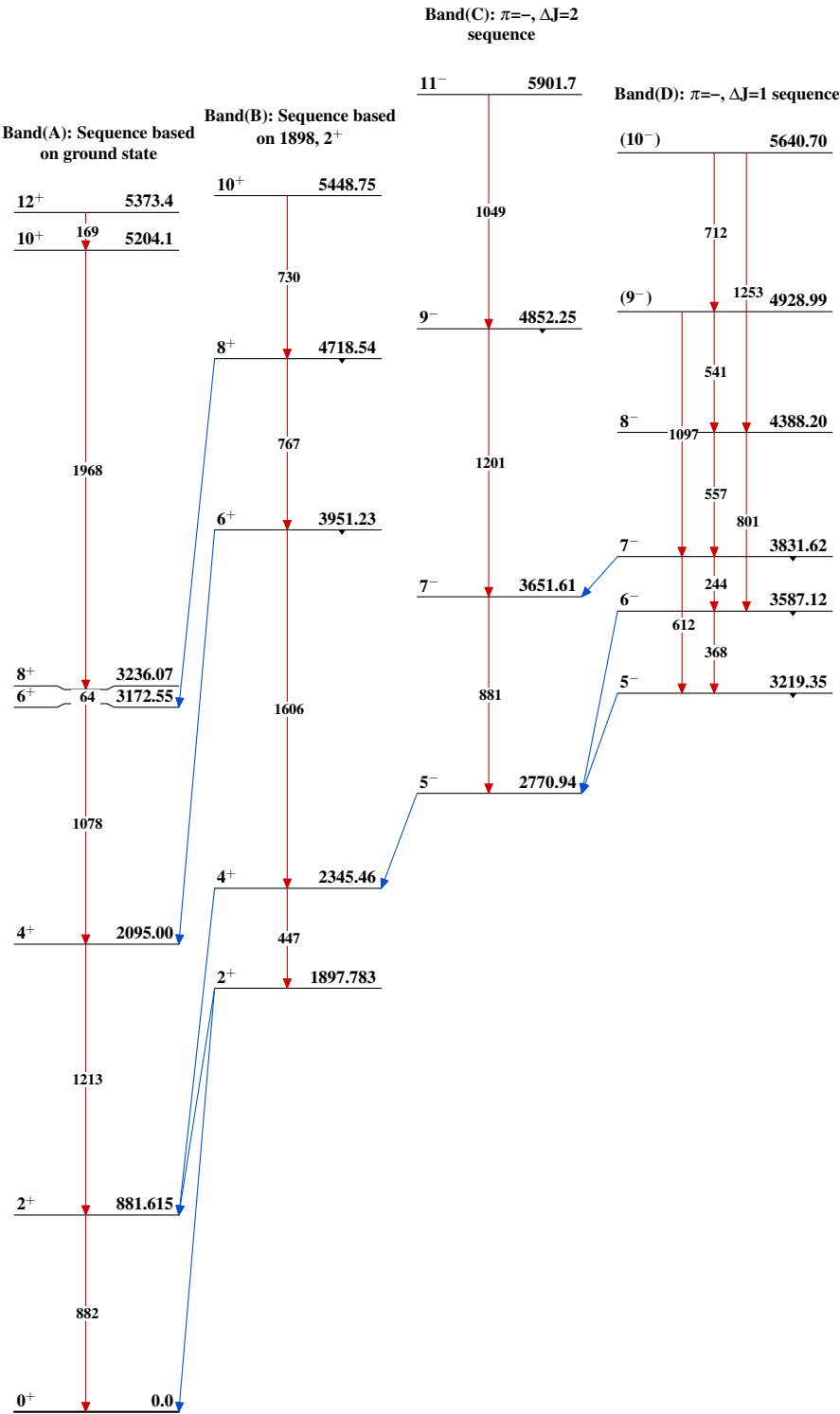
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{84}_{36}\text{Kr}_{48}$

Adopted Levels, Gammas



$^{84}_{36}\text{Kr}_{48}$