Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh	NDS 110, 1917 (2009)	30-Jun-2009

Q(β^-)=−7244 *4*; S(n)=12081.5 *21*; S(p)=8234 *3*; Q(α)=−4391.3 *7* 2012Wa38

Note: Current evaluation has used the following Q record.

S(2n)=21308 *4*, S(2p)=13505.6 *7* (2009AuZZ,2003Au03). Values In 2003Au03 are very nearly the same As In 2009AuZZ except for small differences In uncertainties.

Measured mass excess=−74179.4 *9* (2006Ri15).

Q(β^-)=−7243 *8*; S(n)=12081.4 *21*; S(p)=8234 *3*; Q(α)=−4391.9 *8* 2009AuZZ,2003Au03

Mass measurements: 2006Ri15 (LEBIT-NSCL Penning-trap method), 2006Ro11, 2005Sc26, 2002He23, 1978Di09.

Measurement of Hyperfine structure, isotope shift, etc.: 1995Ke04, 1992Sc19, 1990Ca26, 1990Sc30, 1989Tr04, 1981Ge06, 1979Ge06, 1977Ge05.

Additional information 1.

^{78}Se(π^+,π^-): 1995Hu09.

Structure calculations (rotational bands, levels, deformation, transition probabilities, shape coexistence, etc.): 2007An01, 2006Be31, 2006Pe03, 2006Ve11, 2005Al19, 2003Sh17, 2000Gi16, 1996Tr01, 1995De02, 1991Jo03, 1991Le26, 1988Pr03, 1984Er02, 1984Se01, 1982So09, 1981Bu06, 1979Ka30.

^{78}Kr Levels

Cross Reference (XREF) Flags

A	^{78}Br β^- decay (6.46 min):?	E	^{65}Cu(^{16}O,p2nγ),(^{19}F,α2nγ)	I	^{78}Kr(p,p′),(p,p′γ)
B	^{78}Rb ε decay (17.66 min)	F	^{68}Zn(^{12}C,2nγ) E=33-38 MeV	J	Coulomb excitation
C	^{78}Rb ε decay (5.74 min)	G	^{68}Zn(^{12}C,2nγ) E=36 MeV	K	^{79}Br(p,2nγ)
D	^{58}Ni(^{23}Na,3pγ),(^{27}Al,α3pγ),	H	^{76}Se(α,2nγ)	L	^{80}Kr(p,t)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
0.0[a]	0+	stable	ABCDEFGHIJK	XREF: A(?). $<r^2>^{1/2}$=4.2032 fm *16* (2004An14 evaluation). $T_{1/2}$: ≥1.5×10^{21} y (2006Ga43, 90% confidence limit) for double β decay (2ε(K),2ν+0ν mode). Others: 2000Ga54, 1998Ga27, 1995Sa58, 1994Sa31. See also 2002Tr04 evaluation. Additional information 2.
455.033[a] *23*	2+	21.6 ps *7*	ABCDEFGHIJK	μ=+0.86 *2* (2004Ku11) XREF: A(?). β_2(p,p′)=0.351 (DWBA analysis), 0.317 (coupled-channel). μ: transient magnetic field technique following Coulomb excitation (2004Ku11). Other: +0.86 *6* (2001Me20). See also 2005St24 compilation. Jπ: L(p,p′)=2 and also from $\gamma(\theta)$ and γ(linear pol). $T_{1/2}$: weighted average of values from recoil-distance Doppler-shift method in in-beam γ-ray studies, DSA and B(E2) in Coul. ex. Values in ps are: 21.7 *+7−8* (B(E2) In Coul. ex.,2006Be18), 22.2 *14* (RDDS,2002Jo07), 19.1 *17* (DSAM In Coul. ex.,2001Me20), 21.1 *9* (RDDS,1990Ga22), 22.9 *21* (RDDS,1985Wi01,1982An06), >3.5 (DSA,1980Ro02), 22.2 *14* (RDDS,1979He18), 25 *3* (RDDS,1974No08).
1017.18 *3*	0+	10.8 ps *9*	BCD IJ L	Jπ: E0 transition to 0+ (1995Gi13); L(p,t)=0. $T_{1/2}$: weighted average of 11.1 ps *6* (B(E2) in Coul. ex.,2006Be18) and 7.6 ps *21* (DSA in (p,p′γ,1995Gi13).
1119.48[a] *4*	4+	2.52 ps *12*	BCDEFGHIJK	μ=+1.84 *28* (2001Me20) μ: transient magnetic field technique following Coulomb excitation (2001Me20). See also 2005St24 compilation.

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Adopted Levels, Gammas (continued)

^{78}Kr Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
				β_2(DWBA)=0.101, B(E4)(W.u.)=5.5 *11* in (p,p′). Jπ: L(p,p′)=4 and from $\gamma(\theta)$ and γ(linear pol). $T_{1/2}$: weighted average of values from recoil-distance Doppler-shift method in in-beam γ-ray studies, DSA and B(E2) in Coul. ex. Values in ps are: 2.42 *+8−17* (B(E2) In Coul. ex.,2006Be18), 2.36 *21* (RDDS,2002Jo07), 2.09 *18* (DSAM In Coul. ex.,2001Me20), 2.70 *35* (DSA,1993Bi04), 2.91 *14* (RDDS,1990Ga22), 2.56 *35* (RDDS,1985Wi01,1982An06), 6.2 *28* (DSA,1980Ro02), 2.50 *21* (RDDS,1979He18).
1147.901[@] *24*	2+	3.3 ps *6*	BCDEFGHIJK	μ=+1.08 *20* (2001Me20) μ: transient magnetic field technique following Coulomb excitation (2001Me20). See also 2005St24 compilation. β_2(DWBA)=0.065, B(E2)(W.u.)=1.8 *4* from (p,p′). Jπ: L(p,p′)=2 and from $\gamma(\theta)$ and γ(linear pol). $T_{1/2}$: weighted average of 2.2 ps *+5−4* (B(E2) in Coul. ex.,2006Be18), 3.1 ps *6* (RDDS,1982An06) and 4.02 ps *35* (RDDS,1979He18). Other: >0.6 ps (DSA,1980Ro02).
1564.76[&] *4*	3+	4.73 ps *35*	BCDEFGH K	Jπ: $\gamma(\theta)$; γ(linear pol) of 735γ from 5+ (2299) level. $T_{1/2}$: weighted average of 5.1 ps *4* (RDDS,1982An06) and 4.44 ps *35* (RDDS,1979He18). Other: >1.0 ps (DSA,1980Ro02).
1653.9? *4*			F	E(level): level is suspect, reported only in one study.
1755.86 *3*	2+	5.3 ps *4*	BCD J	Jπ: E2 γ′s to 0+ and 4+. $T_{1/2}$: from B(E2) for 739γ In Coul. ex. (2006Be18). Other: 0.074 ps *12* from B(E2) for 1756γ In Coul. ex. (2006Be18) is discrepant.
1772.93 *4*	(1,2)+		BC	Jπ: M1,E2 γ to 2+; γ to 0+.
1872.91[@] *4*	4+	1.58 ps *17*	CDEFGH JK	Jπ: $\gamma(\theta)$ and γ(linear pol). $T_{1/2}$: weighted average of 1.72 ps *+14−20* (B(E2) in Coul. ex.,2006Be18), 2.1 ps *7* (RDDS,1982An06) and 1.32 ps *21* (RDDS,1979He18). Other: >2.1 ps (DSA,1980Ro02).
1977.91[a] *7*	6+	0.65 ps *7*	BCDEFGH JK	XREF: B(?). Jπ: $\gamma(\theta)$ and γ(linear pol). $T_{1/2}$: weighted average of values from Doppler-shift (DSA) method in in-beam γ-ray studies and B(E2) in Coul. ex. Values in ps are: 0.61 *7* (B(E2) In Coul. ex.,2006Be18), 0.82 *19* (DSA,2006Dh01), 0.57 *21* (DSA,2002Jo07), 0.83 *14* (DSA,1993Bi04), 0.49 *14* (DSA) and 0.69 *14* (RDDS) (1985Wi01,1982An06), 1.25 *28* (DSA,1980Ro02), 0.62 *10* (RDDS and DSA,1979He18), <2 (RDDS,1974No08).
2007.41 *5*	(0 to 3)		BC	XREF: C(?). Jπ: γ′s from (1+).
2234.19 *4*	(0 to 4)+		BC	Jπ: M1,E2 γ to 2+.
2240.69 *5*	(1,2)+		BC	Jπ: M1+E2 γ to 2+; γ′s to 0+ and 3+.
2299.78[&] *5*	5+	0.57 ps *16*	CDEFGH K	Jπ: $\gamma(\theta)$ and γ(linear pol). $T_{1/2}$: weighted average of 0.44 ps *9* (DSA,2002Jo07), 1.10 ps *28* (RDDS,1982An06), 1.0 *+10−3* (DSA,1980Ro02) and 1.25 ps *28* (RDDS,1979He18).
2399.03[f] *5*	3−	0.62 ps *14*	BCDEFGHI L	B(E3)↑=0.042 *14* (1978Ma11,2002Ki06) XREF: I(2384)L(2380). Jπ: L(p,p′)=3. L(p,t)=3. $T_{1/2}$: from DSA (1985Wi01,1982An06).
2413.41 *11*	2+,3+,4+		CD	Jπ: M1,E2 γ to 2+ and 3+; possible β feeding from 4(−).
2443.37 *5*	(1,2)+		BC J	XREF: J(?). Jπ: M1+E2 γ to 2+; γ to 0+.
2472.0 *5*	(2,3)		F	Jπ: ΔJ=0,1 γ to 2+.
2508.02 *9*			BC	Jπ: γ to 2+.
2573.36 *7*	1−,2−,3−		BCD	Jπ: E1 γ to 2+. Small ε feedings from 4(−) and 0(+) giving

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Adopted Levels, Gammas (continued)

^{78}Kr Levels (continued)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
				inconsistent assignments are probably not reliable.
2656.12 *5*	(0,1)		B	Jπ: log *ft*=7.7 from $0^{(+)}$; γ to 2^+.
2677.63 *9*	3^-		CD	Jπ: E1 γ to 2^+; log *ft*=6.9 from $4^{(-)}$.
2731.7@ *4*	(6^+)	1.5 ps *7*	DEFGH J	XREF: J(?). Jπ: band assignment; γ′s to 4^+ and 6^+. $T_{1/2}$: weighted average of 1.4 ps *7* (RDDS,1982An06), 1.7 ps *9* (DSA,1980Ro02) and 1.4 ps *7* (DSA,1979He18).
2749.75f *7*	5^-	1.36 ps *21*	CDEFGH	Jπ: γ(θ) and γ(linear pol). $T_{1/2}$: weighted average of 0.76 ps *+62−28* (DSA,1985Wi01,1982An06), 0.9 *+14−5* (DSA,1980Ro02) and 1.52 ps *21* (RDDS,1979He18).
2764.10e *5*	$(4)^-$	1.9 ps *5*	CDEFGH	Jπ: E1 γ′s to 3^+ and 4^+; log *ft*=6.2 from $4^{(-)}$. $T_{1/2}$: from <2.08 ps *35* (effective half-life,RDDS,1985Wi01,1982An06) and >1.4 ps (DSA,1985Wi01).
2882.07 *9*	3^-		BC I L	XREF: I(2871)L(2874). B(E3)(W.u.)=6.2 *9* from (p,p′). Jπ: L(p,p′)=3 and L(p,t)=3.
2882.84 *7*	(1)		B	Jπ: log *ft*=7.7 from $0^{(+)}$; γ′s to 0^+ and 2^+.
2890.66d *11*	(4^-)		D	Jπ: γ′s to 3^+ and 4^+.
2901.82 *24*	$(4,5,6^+)$		D	Jπ: γ to 4^+.
2968.48 *19*			D	
2992.55 *7*			BC	Jπ: γ to 2^+.
2993.52a *12*	8^+	0.31 ps *3*	DEFGH J	Jπ: γ(θ) and γ(pol). $T_{1/2}$: weighted average of values from Doppler-shift (DSA) method in in-beam γ-ray studies and B(E2) in Coul. ex. Values in ps are: 0.28 *3* (B(E2) In Coul. ex.,2006Be18), 0.28 *7* (DSA,2006Dh01), 0.44 *9* (DSA,2002Jo07), 0.37 *5* (DSA,1993Bi04), 0.25 *4* (DSA,1985Wi01), 0.30 *+10−7*, 0.26 *6*, 0.22 *4* (DSA,1982An06), 0.49 *14* (DSA,1980Ro02), 0.31 *4* (DSA,1979He18).
2999.37 *8*	3^-		CD	Jπ: E1 γ to 4^+; γ to 2^+.
3036.5 *5*			D	
3064.71b *10*	$(5)^-$	1.0 ps *+8−4*	BCD GH	XREF: B(?). Jπ: E1 γ to 6^+; γ to 5^+; ΔJ=(0) γ to 5^-. $T_{1/2}$: from DSA (1982An06).
3072.40c *7*	(5^-)		CD	Jπ: log *ft*=6.8 from $4^{(-)}$; γ to 4^+.
3105.36 *6*	$3^-,4^-,5^-$		C	Jπ: E1 γ to 4^+; log *ft*=6.6 from $4^{(-)}$.
3137.4 *3*			D	
3161.18 *6*	3^-		CD	Jπ: E1 γ′s to 2^+ and 4^+.
3202.7& *3*	$(7)^+$	0.50 ps *14*	DEFGH	Jπ: ΔJ=2, E2 γ to 5^+; band assignment. $T_{1/2}$: weighted average of 0.62 ps *21*, 0.38 ps *14*, 0.49 ps *14* (DSA,1982An06), 0.69 ps *28* (DSA,1980Ro02) and 0.62 ps *+42−21* (DSA,1979He18).
3219.88e *22*	(6^-)	5.0 ps *14*	DEFGH	Jπ: γ(θ); γ′s to 5^+ and 6^+; band assignment. $T_{1/2}$: weighted average of 4.9 ps *14* (RDDS,1985Wi01) and 5.1 ps *+21−14* (RDDS,1982An06).
3230.48 *5*	(1)		B	Jπ: log *ft*=7.2 from $0^{(+)}$; γ′s to 0^+ and 2^+.
3233.55 *6*	$3^-,4^-$		C	Jπ: E1 γ′s to 3^+ and 4^+.
3288.36f *10*	7^-	1.95 ps *21*	DEFGH	Jπ: γ(θ), γ(linear pol); band assignment. $T_{1/2}$: weighted average of 1.94 ps *21* (RDDS,1985Wi01,1982An06), 1.3 ps *8* (DSA,1980Ro02) and 2.01 ps *21* (RDDS,1979He18).
3337.86 *25*			D	
3340.64d *24*	(6^-)		D	Jπ: ΔJ=1 γ to $(5)^-$; γ to and (4^-).
3361.12 *11*	$4^-,5^-,6^-$		C	Jπ: M1 γ to 5^-; 6^- is less likely from log *ft*=6.9 from $4^{(-)}$.
3437.42 *5*	(1)		B	Jπ: log *ft*=6.1 from $0^{(+)}$; γ′s to 0^+ and 2^+.
3440.4 *4*			D	

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Adopted Levels, Gammas (continued)

^{78}Kr Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
3539.07 *4*	(1)		B	Jπ: log *ft*=6.4 from $0^{(+)}$; γ's to 0^+ and 2^+.
3548.1 *4*			D	
3575.08 *6*	(1)		B	Jπ: log *ft*=6.8 from $0^{(+)}$; γ to 0^+.
3607.6 *4*	7^-	1.7 ps *5*	D FGH	Jπ: γ(θ) and γ(linear pol). $T_{1/2}$: weighted average of 1.9 ps *5* (DSA,line shape), 2.6 ps *+10–8* (RDDS)(1982An06) and 1.0 ps *+14–4* (DSA,1980Ro02).
3662.17 *5*	(1)		B	Jπ: log *ft*=6.5 from $0^{(+)}$; γ's to 0^+ and 2^+.
3669.22 *6*	3^-,4^-		C	Jπ: M1 γ to 3^-; log *ft*=6.2 from $4^{(-)}$.
3703.9[c] *3*	(7^-)		D FGH	Jπ: ΔJ=1 γ to 6^+; γ to (5^-).
3725.48 *6*	3^+,4^+		CD	Jπ: E1 γ to 3^-; log *ft*=6.2 from $4^{(-)}$.
3749.14 *9*	(3,4,5^-)		BCD	Jπ: log *ft*=6.9 from $4^{(-)}$; γ to 3^-.
3770.9[@] *5*	(8^+)	0.186 ps *30*	DEFGH	Jπ: ΔJ=2, E2 γ to 6^+; band assignment. $T_{1/2}$: weighted average of 0.16 ps *4* (DSA,line shape), 0.208 ps *35* (DSA), 0.187 ps *35* (DSA) (1982An06) and 0.24 ps *7* (DSA,1980Ro02).
3771.32[b] *25*	(7^-)	0.62 ps *+49–21*	D FGH	Jπ: γ's to 6^+ and (5^-). $T_{1/2}$: from DSA (1982An06).
3774.59 *5*	$(3)^-$		CD	Jπ: M1+E2 γ to 3^-; γ's to 2^+ and 4^+.
3791.7 *5*		>0.7 ps	D GH	$T_{1/2}$: from DSA (1982An06).
3829.45 *6*	(1)		B	Jπ: log *ft*=6.5 from $0^{(+)}$; γ's to 0^+ and 2^+.
3893.27 *5*	(1)		B	Jπ: log *ft*=5.7 from $0^{(+)}$; γ's to 0^+ and 2^+.
3918.4[e] *3*	(8^-)	0.95 ps *21*	DEFGH	Jπ: γ(θ) and γ(linear pol). $T_{1/2}$: weighted average of 0.83 ps *35* (RDDS,1985Wi01,1982An06), 1.39 ps *35* (DSA,1980Ro02) and 0.83 ps *21* (RDDS,1979He18).
3919.7 *6*			D	
3922.8 *4*			D	
3937.57 *4*	(1)		B	Jπ: log *ft*=6.4 from $0^{(+)}$; γ's to 0^+ and 2^+.
4007.80 *5*	(1)		BC	XREF: C(?). Jπ: log *ft*=6.5 from $0^{(+)}$; γ's to 0^+ and 2^+.
4028.75[f] *14*	(9^-)	0.81 ps *7*	DEFGH	Jπ: γ(θ), γ(linear pol). $T_{1/2}$: weighted average of 0.94 ps *14* (DSA,2006Dh01), 0.97 ps *28* (DSA) and 1.2 ps *5* (RDDS)(1985Wi01,1982An06), 1.5 ps *6* (DSA,1980Ro02) and 0.76 ps *7* (RDDS,1979He18).
4040.39 *5*	(1)		B	Jπ: log *ft*=6.3 from $0^{(+)}$; γ to 0^+.
4089.32 *5*	(1)		B	Jπ: log *ft*=6.3 from $0^{(+)}$; γ's to 0^+ and 2^+.
4106.0[a] *3*	10^+	0.21 ps *3*	DEFGH J	Jπ: ΔJ=2, E2 γ to 8^+. $T_{1/2}$: weighted average of values from Doppler-shift (DSA) method in in-beam γ-ray studies and B(E2) in Coul. ex. Values in ps are: 0.24 *+2–3* (B(E2) In Coul. ex.,2006Be18), 0.152 *35* (DSA,2006Dh01), 0.20 *4* (DSA,2002Jo07, also 0.19 *8* and <0.35 listed), 0.42 *14* (DSA,1993Bi04,effective value), 0.21 *4* (DSA,1985Wi01, 1982An06), 0.208 *35* (DSA,line shape) and 0.097 *28* (DSA) (1982An06), 0.33 *7* (DSA,1980Ro02).
4201.68 *8*	(1)		B	Jπ: log *ft*=6.9 from $0^{(+)}$; γ's to 0^+ and 2^+.
4213.3[d] *4*	(8^-)		D	Jπ: ΔJ=(2) γ to (6^-); γ to (7^-).
4253.7[&] *5*	(9^+)	0.19 ps *6*	DEFGH	Jπ: ΔJ=(2), (E2) γ to 7^+. $T_{1/2}$: unweighted average of 0.083 ps *28* (DSA,line shape), 0.125 ps *35* (DSA), 0.21 ps *8* (DSA) (1982An06), 0.35 ps *7* (DSAM,1980Ro02).
4396.5 *4*	(10^+)	0.146 ps *28*	D GH	Jπ: ΔJ=(0), (M1) γ to 10^+; γ to 8^+. $T_{1/2}$: from DSA (1985Wi01,1982An06). Other: 0.10 ps *4*, 0.08 ps *+5–4*(DSA) (1982An06).
4420.86 *9*	(1)		B	Jπ: log *ft*=6.6 from $0^{(+)}$; γ's to 0^+ and 2^+.
4673.1[c] *5*	(9^-)		D	Jπ: ΔJ=2 γ to (7^-); ΔJ=1 γ to 8^+.

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Adopted Levels, Gammas (continued)

^{78}Kr Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
4732.0[b] 7	(9⁻)		D	Jπ: γ to (7⁻).
4808.5[e] 3	(10⁻)	<1.6 ps	DEFGH	Jπ: ΔJ=2, E2 γ to 8⁻. $T_{1/2}$: weighted average of 1.25 *35* (DSA,1985Wi01,1982An06) and 1.11 ps *35* (RDDS,1985Wi01,1982An06) is 1.18 ps *35*. As stated by 1985Wi01 this value is effective half-life, thus given as an upper limit here. Other:≤1.0 ps (RDDS,1979He18).
4858.7?[@] 5	(10⁺)		DE	Jπ: possible γ to (8⁺); possible band member.
4955.4 7	(10⁺)	0.45 ps *17*	GH	Jπ: γ to (8⁺). $T_{1/2}$: from DSA (line-shape) (1982An06). Other: 0.24 ps *9* and 0.12 ps *6* from DSA (1982An06).
4965.86[f] 24	(11⁻)	0.34 ps *6*	DEFGH	Jπ: ΔJ=2, E2 γ to 9⁻. $T_{1/2}$: from DSA. Weighted average of 0.24 ps *6* (2006Dh01), 0.38 ps *7* (1985Wi01,1982An06), 0.49 ps *+35−21* and 0.44 ps *+23−15* (1982An06), 0.49 ps *7* (1980Ro02), 0.25 *8* (1979He18).
5011.52 7	(1)		B	Jπ: log *ft*=6.1 from $0^{(+)}$; γ's to 0^+ and 2^+.
5061.68 17	(1)		B	Jπ: log *ft*=6.2 from $0^{(+)}$ and γ to 2^+.
5180.74 8	(1)		B	Jπ: log *ft*=5.8 from $0^{(+)}$; γ's to 0^+ and 2^+.
5192.50 11	(1)		B	Jπ: log *ft*=5.7 from $0^{(+)}$ and γ's to 0^+, 2^+.
5217.1[d] 7	(10⁻)		D	Jπ: ΔJ=(2) γ to (8⁻).
5217.8[a] 5	12⁺	0.18 ps *3*	DEFGH J	XREF: J(?). Jπ: ΔJ=2, E2 γ to 10^+. $T_{1/2}$: from DSA. Weighted average of 0.15 ps *4* (2006Dh01), 0.18 ps *3* and 0.21 ps *4* (2002Jo07), 0.17 ps *10* (1985Wi01).
5222.58 11	(1)		B	Jπ: log *ft*=6.1 from $0^{(+)}$; γ to 2^+.
5244.01 8	(1)		B	Jπ: log *ft*=5.9 from $0^{(+)}$; γ's to 0^+ and 2^+.
5333.04 12	(1)		B	Jπ: log *ft*=5.9 from $0^{(+)}$; γ's 0^+ and 2^+.
5369.56 15	(1)		B	Jπ: log *ft*=6.1 from $0^{(+)}$.
5441.7 11	(11⁺)	0.21 ps *8*	D GH	Jπ: γ to (9^+). $T_{1/2}$: from DSA (1982An06). Weighted average of 0.24 ps *10*, 0.21 ps *8* and 0.18 ps *9*.
5529.19 11	(1)		B	Jπ: log *ft*=5.5 from $0^{(+)}$; γ to 0^+.
5543.68 16	(1)		B	Jπ: log *ft*=6.1 from $0^{(+)}$.
5567.79 16	(1)		B	Jπ: log *ft*=5.8 from $0^{(+)}$; γ's to 0^+ and 2^+.
5586.08 16	(1)		B	Jπ: log *ft*=6.1 from $0^{(+)}$.
5776.3[c] 9	(11⁻)		D	Jπ: γ to (9^-).
5838.0[b] 12	(11⁻)		D	Jπ: γ to (9^-).
5855.0[e] 6	(12⁻)		D	Jπ: ΔJ=2 γ to (10^-).
6087.2[f] 8	(13⁻)	0.14 ps *3*	DE	Jπ: ΔJ=2, E2 γ to (11^-). $T_{1/2}$: from DSA. Weighted average of 0.132 ps *28* (2006Dh01), 0.22 ps *10* (1979He18).
6305.1[d] 12	(12⁻)		DE	Jπ: γ to (10^-).
6480.3[a] 6	14⁺	0.092 ps *21*	DE GH	Jπ: ΔJ=2, E2 γ to 12^+. $T_{1/2}$: from DSA. Weighted average of 0.118 ps *35* (2006Dh01), 0.09 ps *4* and 0.076 ps *21* (2002Jo07), 0.15 ps *6* (1979He18).
6832.7? 13	(13⁺)		D	Jπ: possible γ to (11^+); possible yrast state.
6853.3[c] 13	(13⁻)		D	Jπ: γ to (11^-).
7066.8[e] 9	(14⁻)		D	Jπ: γ to (12^-).
7392.5[f] 11	(15⁻)	0.083 ps *28*	D	Jπ: γ to (13^-). $T_{1/2}$: from DSA (2006Dh01).
7457.1?[d] 13	(14⁻)		D	Jπ: γ to (12^-).
7938.0[a] 10	16⁺	0.152 ps *35*	DE	Jπ: ΔJ=(2), (E2) γ to 14^+. $T_{1/2}$: from DSA. Weighted average of 0.20 ps *5* (2006Dh01), 0.10 ps *6* and 0.146 ps *35* (2002Jo07). Other:≤0.14 ps (1979He18).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{78}Kr Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
8469.2[e] *12*	(16^-)		D	Jπ: γ to (14^-).
8882.4[f] *14*	(17^-)		D	Jπ: γ to (15^-).
9570.0[a] *14*	18^+	0.061 ps *23*	D	Jπ: γ to 16^+. $T_{1/2}$: from DSA. Weighted average of 0.055 ps *21* (2006Dh01) and 0.15 ps *8* (2002Jo07).
10061.2[e] *16*	(18^-)		D	Jπ: γ to (16^-).
10551.4[f] *17*	(19^-)		D	Jπ: γ to (17^-).
11314.0[a] *18*	20^+	0.072 ps *35*	D	Jπ: γ to 18^+. $T_{1/2}$: from DSA. Weighted average of 0.062 ps *35* (2006Dh01) and 0.10 ps *6* (2002Jo07).
12389.4[f] *20*	(21^-)		D	Jπ: γ to (19^-).
13159.0[a] *20*	22^+	0.062 ps *35*	D	Jπ: γ to 20^+. $T_{1/2}$: from DSA. Weighted average of 0.055 ps *35* (2006Dh01) and 0.15 ps *12* (2002Jo07).
15163.2[a] *21*	(24^+)	<0.64 ps	D	Jπ: γ to 22^+. $T_{1/2}$: <0.42 ps *22* from DSA (2002Jo07).
15198.8? *21*	(24^+)		D	Jπ: possible γ to 22^+.
17296.5?[a] *21*	(26^+)		D	Jπ: possible γ to (24^+).

[†] From least-squares fit to Eγ's. Uncertainty of 0.5 keV used for Eγ when not stated. Normalized χ^2=1.2.

[‡] Weighted average of different measurements have been taken. Most values are from recoil-distance Doppler shift (RDDS) and DSA methods in in-beam γ-ray measurements. Some values are also deduced from B(E2) values in Coulomb excitation . Note that some of the values in 1985Wi01 and 1982An06 seem to be from the same experiment as several authors are common in these two papers. In the averaging procedure, value from only one of these two papers is used when this is the case, even though all values are stated in comments for the sake of completeness.

[#] For high-spin (J>5) levels, assignments are based on γ(θ) and γ(pol) measurements and band associations in in-beam γ-ray studies. Ascending spins with rise in excitation energy are assumed in these reactions. Other complementary arguments are given under comments. For low-spin (J<6)states, the assignments are based on log *ft* values and ce data for selected transitions.

[@] Band(A): γ band, even spins.

[&] Band(a): γ band, odd spins.

[a] Band(B): g.s. band. The band is forked above 22^+. Average g factor=0.54 5 (1981Wa16), same value for J=2 to 8 levels and J=8 to 12 levels, suggesting no change in g factor in the band up to spin 12. In this g factor, uncertainty of 20% in the calibration of the field is not included.

[b] Band(C): Band based on 5^-, 3065.

[c] Band(D): Band based on (5^-), 3072.

[d] Band(E): Band based on (4^-), 2891.

[e] Band(F): Band based on 4^-, 2764.

[f] Band(G): Band based on 3^-.

Adopted Levels, Gammas (continued)

γ(^{78}Kr)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
455.033	2^+	454.99 *5*	100	0.0	0^+	E2			B(E2)(W.u.)=67.9 *22*
1017.18	0^+	562.15 *5*	100	455.033	2^+	E2			B(E2)(W.u.)=47 *4*
		1017		0.0	0^+	E0			q_K^2(E0/E2)=0.136 *6*, X(E0/E2)=0.024 *1*, ρ^2(E0)=0.047 *13* (2005Ki02 evaluation, data from 1995Gi13).
1119.48	4^+	664.42 *5*	100	455.033	2^+	E2			B(E2)(W.u.)=88 *5*
1147.901	2^+	692.88 *5*	100.0 *6*	455.033	2^+	M1+E2	+0.45 *10*		B(M1)(W.u.)=0.0103 *21*; B(E2)(W.u.)=5.6 *24*
		1147.87 *5*	62.4 *12*	0.0	0^+	E2			B(E2)(W.u.)=1.7 *3*
1564.76	3^+	416.77 *5*	17.2 *7*	1147.901	2^+	(M1)			B(M1)(W.u.)=0.0090 *8* Additional information 3.
		445.28 *5*	5.3 *3*	1119.48	4^+	(M1)			B(M1)(W.u.)=0.00228 *22*
		1109.72 *5*	100.0 *16*	455.033	2^+	E2+M1			
1653.9?		534.4	24 *5*	1119.48	4^+				
		1198.9[c]	100 *19*	455.033	2^+				E_γ: this γ is placed from three other levels, placement here is suspect.
1755.86	2^+	607.94 *8*	4.7 *10*	1147.901	2^+	E2+M1	4.0 *35*		B(E2)(W.u.)=1.5 *4*; B(M1)(W.u.)=3.E−5 *+5−3* Mult.,δ: from α(K)exp In ^{78}Rb ε decay (17.66 min).
		636.27 *10*	11.9 *4*	1119.48	4^+	E2			B(E2)(W.u.)=3.2 *3*
		738.66 *5*	51.7 *8*	1017.18	0^+	E2			B(E2)(W.u.)=6.5 *5*
		1300.83 *5*	100.0 *16*	455.033	2^+	M1+E2	−1.32 *+12−55*	3.00×10^{-4}	B(M1)(W.u.)=0.00036 *5*; B(E2)(W.u.)=0.47 *5*
		1755.94 *10*	25.4 *8*	0.0	0^+	[E2]			B(E2)(W.u.)=0.042 *4*
1772.93	$(1,2)^+$	1317.90 *5*	100 *6*	455.033	2^+	M1,E2			
		1772.89 *5*	24 *5*	0.0	0^+				
1872.91	4^+	725.06 *8*	100 *3*	1147.901	2^+	E2			B(E2)(W.u.)=51 *6*
		753.37 *8*	62.5 *16*	1119.48	4^+	E2+M1	+3.2 *+23−12*	9.85×10^{-4} *22*	B(M1)(W.u.)=0.0010 *+14−10*; B(E2)(W.u.)=24 *4* Additional information 4.
		1417.90 *8*	15.2 *9*	455.033	2^+	E2			B(E2)(W.u.)=0.27 *4*
1977.91	6^+	858.33 *10*	100	1119.48	4^+	E2			B(E2)(W.u.)=94 *11*
2007.41	(0 to 3)	859.56 *10*	100	1147.901	2^+				
2234.19	$(0 \text{ to } 4)^+$	1779.11 *5*	100	455.033	2^+	M1,E2			
2240.69	$(1,2)^+$	675.89 *9*	25.8 *18*	1564.76	3^+				
		1785.55 *12*	62.7 *18*	455.033	2^+	M1,E2			
		2240.69 *7*	100 *3*	0.0	0^+				
2299.78	5^+	426.5[#c] *4*	44 *5*	1872.91	4^+	(M1)			B(M1)(W.u.)=0.12 *4*
		734.98 *5*	100 *5*	1564.76	3^+	E2			B(E2)(W.u.)=1.3×10^2 *4*
		1180.35 *7*	40 *3*	1119.48	4^+	E2+M1	+2 *1*		B(M1)(W.u.)=0.0010 *9*; B(E2)(W.u.)=3.8 *14*
2399.03	3^-	1943.97 *5*	100	455.033	2^+	(E1)			B(E1)(W.u.)=8.1×10^{-5} *19*
		(2399)		0.0	0^+				B(E3)(W.u.)=16.7 *25* B(E3)(W.u.) from (p,p′).
2413.41	$2^+,3^+,4^+$	848.58 *15*	53 *4*	1564.76	3^+	M1,E2			Additional information 5.
		1265.63 *15*	100 *5*	1147.901	2^+	M1,E2			
		1293.5[#c] *4*	38 *10*	1119.48	4^+				

Adopted Levels, Gammas (continued)

γ(^{78}Kr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
2443.37	(1,2)$^+$	687.55 *8*	70 *4*	1755.86	2$^+$	M1,E2		
		1295.45 *8*	61 *4*	1147.901	2$^+$	M1,E2		
		1988.20 *15*	100 *3*	455.033	2$^+$	M1,E2		
		2443.32 *8*	86.1 *16*	0.0	0$^+$			
2472.0	(2,3)	2016.9	100	455.033	2$^+$	D		
2508.02		2052.96 *8*	100	455.033	2$^+$			
2573.36	1$^-$,2$^-$,3$^-$	1425.56 *14*	36 *3*	1147.901	2$^+$	E1		
		2118.28 *8*	100 *3*	455.033	2$^+$			
2656.12	(0,1)	1508.22 *6*	50.5 *18*	1147.901	2$^+$			
		2201.04 *6*	100 *4*	455.033	2$^+$			
2677.63	3$^-$	1529.81 *12*	100 *3*	1147.901	2$^+$	E1		
		2222.49 *12*	53 *3*	455.033	2$^+$			
2731.7	(6$^+$)	753 *1*	33 *13*	1977.91	6$^+$	(M1)		B(M1)(W.u.)=0.009 *6*
		858.9 *7*	100 *17*	1872.91	4$^+$	E2		B(E2)(W.u.)=31 *16*
2749.75	5$^-$	350.5[#c] *6*	6 *2*	2399.03	3$^-$	E2		B(E2)(W.u.)=210 *80*
		771.95 *7*	8.8 *8*	1977.91	6$^+$	(E1)		B(E1)(W.u.)=4.5×10^{-5} *9*
		1630.28 *6*	100.0 *25*	1119.48	4$^+$	E1(+M2)	−0.03 *4*	B(E1)(W.u.)=(5.5×10^{-5} *9*); B(M2)(W.u.)=(0.08 *+23−8*)
2764.10	(4)$^-$	364.4[#c] *3*	20 *4*	2399.03	3$^-$			
		1199.33[b] *5*	94.7[b] *23*	1564.76	3$^+$	E1		B(E1)(W.u.)=5.0×10^{-5} *14* I_γ: Iγ(1199γ)/Iγ(1645γ)=0.35 *17*, 3.6 *11*, 1.35 In reaction data.
		1644.61 *5*	100.0 *23*	1119.48	4$^+$	E1		B(E1)(W.u.)=2.0×10^{-5} *6*
2882.07	3$^-$	2427.00 *8*	100	455.033	2$^+$			
2882.84	(1)	1734.93 *7*	100 *6*	1147.901	2$^+$			
		2882.75 *12*	46 *4*	0.0	0$^+$			
2890.66	(4$^-$)	1017.7 *1*	≈45	1872.91	4$^+$			
		1326.2 *4*	100 *27*	1564.76	3$^+$			
2901.82	(4,5,6$^+$)	1781.6 *4*	100	1119.48	4$^+$			
2968.48		291.0 *3*	100 *21*	2677.63	3$^-$			
		569.1 *3*	26 *11*	2399.03	3$^-$			
		1403.8 *7*	37 *11*	1564.76	3$^+$			
		1820.9 *6*	21 *5*	1147.901	2$^+$			
		1849.3 *6*	84 *21*	1119.48	4$^+$			
2992.55		1844.66 *7*	100 *4*	1147.901	2$^+$			
		2537.37 *11*	65 *9*	455.033	2$^+$			
2993.52	8$^+$	1015.5 *1*	100	1977.91	6$^+$	E2		B(E2)(W.u.)≈85
2999.37	3$^-$	1852.55[b] *6*	76[b] *12*	1147.901	2$^+$			E_γ: Eγ not used in least-squares fit procedure.
		1879.87 *7*	100 *15*	1119.48	4$^+$	E1		
3036.5		1917.0 *5*	100	1119.48	4$^+$			
3064.71	(5)$^-$	315[#c] *1*	91 *36*	2749.75	5$^-$	(M1)		B(M1)(W.u.)=0.29 *+18−27* Mult.: ΔJ=(0) transition.
		765[#c]	27 *9*	2299.78	5$^+$	[E1]		B(E1)(W.u.)=0.00010 *+6−10*
		1086.79 *7*	100 *36*	1977.91	6$^+$	E1		B(E1)(W.u.)=0.00013 *+8−12*

Adopted Levels, Gammas (continued)

γ(^{78}Kr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
3072.40	(5⁻)	1199.33[b] *5*	≈28[b]	1872.91	4⁺			E_γ: Eγ not used in least-squares fit procedure.
		1952.91 *6*	100 *23*	1119.48	4⁺			
3105.36	3⁻,4⁻,5⁻	341.26 *7*	100 *8*	2764.10	(4)⁻	M1		
		1232.44 *7*	87.2 *21*	1872.91	4⁺	E1		
3137.4		1158.6 *6*	100 *31*	1977.91	6⁺			
		2017.4 *6*	77 *23*	1119.48	4⁺			
3161.18	3⁻	1288.45 *15*	18.3 *18*	1872.91	4⁺	E1		
		1595.8[#c] *5*	44 *17*	1564.76	3⁺			
		2013.25 *6*	100 *3*	1147.901	2⁺	E1		
		2041.52 *15*	28.4 *13*	1119.48	4⁺			I_γ: other: 72 *17* In reaction data.
3202.7	(7)⁺	902.8 *3*	100	2299.78	5⁺	E2		B(E2)(W.u.)≈95
		1225		1977.91	6⁺			
3219.88	(6⁻)	455.5 *6*	<28	2764.10	(4)⁻	[E2]		B(E2)(W.u.)=14 +*15*−*14* I_γ: other:≈160.
		470.0 *5*	84 *13*	2749.75	5⁻	(M1)		B(M1)(W.u.)=0.013 *5* I_γ: other: 50.
		488[c]	<40	2731.7	(6⁺)	[E1]		B(E1)(W.u.)=5.E−5 *5*
		920.1 *5*	100 *8*	2299.78	5⁺	(E1)		B(E1)(W.u.)=3.4×10^{-5} *11*
		1241.7 *6*	64 *8*	1977.91	6⁺	(E1)		B(E1)(W.u.)=9.E−6 *3* Mult.: ΔJ=(0) transition.
3230.48	(1)	2082.60 *6*	71.0 *24*	1147.901	2⁺			
		2213.24 *6*	41.1 *24*	1017.18	0⁺			
		3230.37 *8*	100 *4*	0.0	0⁺			
3233.55	3⁻,4⁻	1360.63 *7*	66 *4*	1872.91	4⁺	E1		
		1668.61 *15*	100 *6*	1564.76	3⁺	E1		
		2114.07 *7*	88 *5*	1119.48	4⁺	E1		
3288.36	7⁻	294.2 *4*	17 *6*	2993.52	8⁺	(E1)		B(E1)(W.u.)=0.00063 *24*
		538.9 *1*	85 *5*	2749.75	5⁻	E2		B(E2)(W.u.)=136 *18*
		1310.2 *1*	100 *6*	1977.91	6⁺	E1(+M2)	−0.06 *7*	B(E1)(W.u.)=(4.2×10^{-5} *6*); B(M2)(W.u.)=(0.4 +*10*−*4*)
3337.86		338.6 *3*	≈29	2999.37	3⁻			
		1773.1 *5*	86 *29*	1564.76	3⁺			
		2217.7 *7*	100 *43*	1119.48	4⁺			
3340.64	(6⁻)	268.6 *4*	22 *6*	3072.40	(5⁻)			
		276.1 *5*	100 *36*	3064.71	(5)⁻	D		
		449.6 *4*	53 *19*	2890.66	(4⁻)			
		591.6 *8*	4.7 *16*	2749.75	5⁻			
3361.12	4⁻,5⁻,6⁻	611.37 *8*	100	2749.75	5⁻	M1		
3437.42	(1)	1203.13 *5*	1.69 *24*	2234.19	(0 to 4)⁺			
		2289.66 *15*	29.2 *5*	1147.901	2⁺			
		2420.27 *6*	88.6 *12*	1017.18	0⁺			
		2982.37 *16*	100.0 *18*	455.033	2⁺			
		3437.38 *15*	87 *4*	0.0	0⁺			
3440.4		690.7 *5*	50 *20*	2749.75	5⁻			

$^{78}_{36}Kr_{42}$-9

Adopted Levels, Gammas (continued)

γ(^{78}Kr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
3440.4		1041.3 *7*	100 *30*	2399.03	3^-			
3539.07	(1)	2391.26 *12*	6.7 *3*	1147.901	2^+			
		2521.80 *12*	4.0 *5*	1017.18	0^+			
		3083.95 *5*	100.0 *13*	455.033	2^+			
		3539.00 *7*	38.9 *9*	0.0	0^+			
3548.1		1248.1 *5*	20 *10*	2299.78	5^+			
		1570.5 *6*	100 *30*	1977.91	6^+			
3575.08	(1)	2557.85 *10*	12.1 *10*	1017.18	0^+			
		3574.99 *6*	100.0 *10*	0.0	0^+			
3607.6	7^-	614.3 *5*	100 *25*	2993.52	8^+	E1(+M2)	<0.012	B(E1)(W.u.)>0.00058?; B(M2)(W.u.)<2.3? Mult.: ΔJ=(0) transition.
		1630.4 *8*	44 *13*	1977.91	6^+	[E1]		B(E1)(W.u.)=3.0×10^{-5} *15*
3662.17	(1)	1428.08 *12*	4.6 *28*	2234.19	$(0\text{ to }4)^+$			
		1906.28 *7*	7.4 *4*	1755.86	2^+			
		2514.13 *8*	100.0 *17*	1147.901	2^+			
		3662.13 *8*	5.5 *4*	0.0	0^+			
3669.22	$3^-,4^-$	1096.02 *15*	65 *3*	2573.36	$1^-,2^-,3^-$	M1,E2		
		1270.17 *6*	100 *4*	2399.03	3^-	M1		
		1796.25 *9*	99 *7*	1872.91	4^+			
3703.9	(7^-)	482.7[c]	≈25	3219.88	(6^-)			
		632.4 *5*	≈25	3072.40	(5^-)			
		1726.0 *5*	100 *25*	1977.91	6^+	D		
3725.48	$3^+,4^+$	823.1[#c] *4*	20 *9*	2901.82	$(4,5,6^+)$			
		1326.48 *9*	19.9 *23*	2399.03	3^-	E1		
		1852.55[b] *6*	100[b] *8*	1872.91	4^+	(M1,E2)		
		1969.6[#c] *6*	29 *20*	1755.86	2^+			
		3270.35[@] *9*	33.1 *20*	455.033	2^+			
3749.14	$(3,4,5^-)$	611.3[#c] *4*	≈13	3137.4				E_γ: a 611γ is placed from 3361 level In ^{78}Rb ε decay.
		1350.11 *8*	100 *40*	2399.03	3^-			
3770.9	(8^+)	1039.2 *1*	100	2731.7	(6^+)	E2		B(E2)(W.u.)≈1.3×10^2
3771.32	(7^-)	698.9 *4*	≈19	3072.40	(5^-)			
		1793.4 *3*	100 *19*	1977.91	6^+	[E1]		B(E1)(W.u.)=9.E−5 *+4−8*
3774.59	$(3)^-$	872.6[#c] *4*	9 *3*	2901.82	$(4,5,6^+)$			
		1199.3[#c] *4*	21 *4*	2573.36	$1^-,2^-,3^-$			E_γ: 1199γ is placed from three different levels by 1999Su02 In reaction data but placement from 3775 level In ^{78}Rb ε decay is inconsistent with level-energy difference. Additional information 6.
		1375.61 *12*	42.3 *20*	2399.03	3^-	M1,E2		
		1901.79 *15*	20.7 *14*	1872.91	4^+			
		2209.76 *8*	27.5 *20*	1564.76	3^+			
		2626.86[@] *13*	98 *4*	1147.901	2^+			
		2654.97[@] *12*	40.3 *17*	1119.48	4^+			

Adopted Levels, Gammas (continued)

γ(^{78}Kr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
3774.59	(3)$^-$	3319.50[@] *7*	100 *3*	455.033	2^+		
3791.7		653.9 *7*	20	3137.4			
		1814.1 *6*	100 *20*	1977.91	6^+		
3829.45	(1)	1595.32 *7*	44.1 *20*	2234.19	(0 to 4)$^+$		
		1822.00 *15*	100 *10*	2007.41	(0 to 3)		
		2681.33 *14*	78 *3*	1147.901	2^+		
		3374.06 *16*	91 *4*	455.033	2^+		
		3829.41 *17*	15.1 *13*	0.0	0^+		
3893.27	(1)	1652.68 *20*	5.35 *17*	2240.69	(1,2)$^+$		
		1885.97 *20*	1.57 *23*	2007.41	(0 to 3)		
		2137.41 *8*	16.16 *23*	1755.86	2^+		
		2745.19 *12*	5.4 *4*	1147.901	2^+		
		3438.16 *15*	100 *3*	455.033	2^+		
		3893.15 *6*	35.4 *5*	0.0	0^+		
3918.4	(8$^-$)	629.4 *8*	12 *3*	3288.36	7^-	[M1+E2]	
		698.6 *2*	100 *5*	3219.88	(6$^-$)	E2	B(E2)(W.u.)=140 *40*
		715 *1*	4.2 *23*	3202.7	(7)$^+$	(E1)	B(E1)(W.u.)=3.6×10^{-5} *21*
		924.4 *7*	10 *4*	2993.52	8^+	[E1]	B(E1)(W.u.)=3.9×10^{-5} *18*
3919.7		1520.7 *6*	100	2399.03	3^-		
3922.8		314.8 *4*	100 *30*	3607.6	7^-		
		1945.8 *6*	90 *30*	1977.91	6^+		
3937.57	(1)	1930.07 *7*	21.4 *17*	2007.41	(0 to 3)		
		2789.59 *7*	33.2 *17*	1147.901	2^+		
		2920.36 *7*	59.6 *23*	1017.18	0^+		
		3482.50 *7*	86 *3*	455.033	2^+		
		3937.50 *7*	100 *3*	0.0	0^+		
4007.80	(1)	1767.05 *8*	59 *7*	2240.69	(1,2)$^+$		
		2000.45 *12*	20 *4*	2007.41	(0 to 3)		
		2990.38 *12*	100 *5*	1017.18	0^+		
		3552.70 *9*	80 *3*	455.033	2^+		
		4007.77 *9*	51 *3*	0.0	0^+		
4028.75	(9$^-$)	740.4 *1*	100 *6*	3288.36	7^-	E2	B(E2)(W.u.)=143 *18*
		1034.7 *6*	11 *3*	2993.52	8^+	(E1)	B(E1)(W.u.)=4.1×10^{-5} *12*
4040.39	(1)	1467.24 *18*	2.9 *6*	2573.36	1$^-$,2$^-$,3$^-$		
		1806.22 *10*	17.9 *6*	2234.19	(0 to 4)$^+$		
		2284.64 *17*	12.3 *9*	1755.86	2^+		
		2892.36 *8*	100 *3*	1147.901	2^+		
		3023.20 *16*	27.0 *18*	1017.18	0^+		
		4040.20 *9*	17.3 *9*	0.0	0^+		
4089.32	(1)	1855.06 *8*	51.6 *16*	2234.19	(0 to 4)$^+$		
		2333.32 *8*	78 *3*	1755.86	2^+		
		2941.40 *7*	100.0 *16*	1147.901	2^+		
		3634.28 *20*	11.8 *22*	455.033	2^+		

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Adopted Levels, Gammas (continued)

γ(^{78}Kr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	Comments
4089.32	(1)	4089.36 *12*	16.1 *22*	0.0	0^+		
4106.0	10^+	1112.2[a] *3*	100	2993.52	8^+	E2	B(E2)(W.u.)=80 *12*
4201.68	(1)	3053.61 *20*	59 *9*	1147.901	2^+		
		3746.58 *8*	100 *5*	455.033	2^+		
		4201.44 *20*	61 *7*	0.0	0^+		
4213.3	(8^-)	508.6 *7*	21 *8*	3703.9	(7^-)		
		872.9 *4*	100 *29*	3340.64	(6^-)	(Q)	
4253.7	(9^+)	1051.0 *4*	100	3202.7	$(7)^+$	(E2)	B(E2)(W.u.)=120 *40*
4396.5	(10^+)	289.5 *5*	23 *9*	4106.0	10^+	(M1)	B(M1)(W.u.)=1.2 *6* Additional information 7. Mult.: ΔJ=(0) transition.
		790[c]		3607.6	7^-		
		1402.3 *6*	100 *27*	2993.52	8^+	[E2]	B(E2)(W.u.)=29 *12*
4420.86	(1)	3272.88 *10*	34 *3*	1147.901	2^+		
		4420.75 *15*	100 *5*	0.0	0^+		
4673.1	(9^-)	969.3 *6*	100 *43*	3703.9	(7^-)	Q	
		1679.4 *6*	71 *29*	2993.52	8^+	D	
4732.0	(9^-)	960.7 *6*	100	3771.32	(7^-)		
4808.5	(10^-)	890.1 *1*	100	3918.4	(8^-)	E2	B(E2)(W.u.)>32
4858.7?	(10^+)	1087.8[c] *2*	100	3770.9	(8^+)		E_γ: γ also placed from 6305 level.
4955.4	(10^+)	1184.5	100	3770.9	(8^+)	[E2]	B(E2)(W.u.)=27 *11*
4965.86	(11^-)	937.1 *2*	100	4028.75	(9^-)	E2	B(E2)(W.u.)=116 *21*
5011.52	(1)	3863.51 *9*	100 *8*	1147.901	2^+		
		3994.23 *9*	81 *8*	1017.18	0^+		
		4556.38 *19*	43 *6*	455.033	2^+		
5061.68	(1)	3913.67 *16*	100	1147.901	2^+		
5180.74	(1)	3173.36 *14*	65 *7*	2007.41	(0 to 3)		
		4725.60 *11*	77 *7*	455.033	2^+		
		5180.40 *13*	100 *5*	0.0	0^+		
5192.50	(1)	4044.31 *15*	100 *3*	1147.901	2^+		
		4175.38 *19*	24.4 *17*	1017.18	0^+		
		4737.44 *22*	29 *3*	455.033	2^+		
5217.1	(10^-)	1003.8 *5*	100	4213.3	(8^-)	(Q)	
5217.8	12^+	821	≈10	4396.5	(10^+)	[E2]	
		1112.2[a] *5*	100	4106.0	10^+	E2	B(E2)(W.u.)=85 *15*
5222.58	(1)	3215.22 *15*	60 *7*	2007.41	(0 to 3)		
		4074.45 *15*	100 *14*	1147.901	2^+		
5244.01	(1)	4095.98 *10*	26 *10*	1147.901	2^+		
		5243.85 *12*	100 *4*	0.0	0^+		
5333.04	(1)	3325.65 *15*	62 *10*	2007.41	(0 to 3)		
		4877.76 *25*	22 *4*	455.033	2^+		
		5332.70 *22*	100 *8*	0.0	0^+		
5369.56	(1)	3361.99 *20*	100 *15*	2007.41	(0 to 3)		

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Adopted Levels, Gammas (continued)

γ(^{78}Kr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
5369.56	(1)	5369.46 *22*	52 *6*	0.0	0^+		
5441.7	(11^+)	1188 *1*	100	4253.7	(9^+)	[E2]	B(E2)(W.u.)=58 *22*
5529.19	(1)	3288.33 *18*	77 *14*	2240.69	$(1,2)^+$		
		3294.66 *25*	89 *11*	2234.19	(0 to 4)$^+$		
		3521.60 *25*	43 *11*	2007.41	(0 to 3)		
		3773.37 *25*	100 *9*	1755.86	2^+		
		5529.28 *22*	83 *9*	0.0	0^+		
5543.68	(1)	3309.41 *15*	100	2234.19	(0 to 4)$^+$		
5567.79	(1)	5112.70 *25*	56 *7*	455.033	2^+		
		5567.50 *20*	100 *10*	0.0	0^+		
5586.08	(1)	3351.81 *15*	100	2234.19	(0 to 4)$^+$		
5776.3	(11^-)	1103.2 *7*	100	4673.1	(9^-)		
5838.0	(11^-)	1106 *1*	100	4732.0	(9^-)		
5855.0	(12^-)	1046.5 *5*	100	4808.5	(10^-)	Q	
6087.2	(13^-)	1121.3 *7*	100	4965.86	(11^-)	E2	B(E2)(W.u.)=115 *25*
6305.1	(12^-)	1088 *1*	100	5217.1	(10^-)		
6480.3	14^+	1262.5 *3*	100	5217.8	12^+	E2	B(E2)(W.u.)=97 *23*
6832.7?	(13^+)	1391[c]	100	5441.7	(11^+)		
6853.3	(13^-)	1077 *1*	100	5776.3	(11^-)		
7066.8	(14^-)	1211.8 *7*	100	5855.0	(12^-)		
7392.5	(15^-)	1305.3 *7*	100	6087.2	(13^-)	[E2]	B(E2)(W.u.)=90 *30*
7457.1?	(14^-)	1152[c]	100	6305.1	(12^-)		
7938.0	16^+	1457.6 *8*	100	6480.3	14^+	(E2)	B(E2)(W.u.)=29 *7*
8469.2	(16^-)	1402.4 *7*	100	7066.8	(14^-)		
8882.4	(17^-)	1489.9 *9*	100	7392.5	(15^-)		
9570.0	18^+	1632 *1*	100	7938.0	16^+	[E2]	B(E2)(W.u.)=40 *16*
10061.2	(18^-)	1592 *1*	100	8469.2	(16^-)		
10551.4	(19^-)	1669 *1*	100	8882.4	(17^-)		
11314.0	20^+	1744 *1*	100	9570.0	18^+	[E2]	B(E2)(W.u.)=25 *12*
12389.4	(21^-)	1838 *1*	100	10551.4	(19^-)		
13159.0	22^+	1845 *1*	100	11314.0	20^+	[E2]	B(E2)(W.u.)=22 *13*
15163.2	(24^+)	2003 *1*	100	13159.0	22^+	[E2]	B(E2)(W.u.)>1.4
15198.8?	(24^+)	2040[c]	100	13159.0	22^+		
17296.5?	(26^+)	2098[c]	≈60	15198.8?	(24^+)		
		2133[c]	≈100	15163.2	(24^+)		

[†] The values given here represent weighted averages of all available data for energies and intensities of γ rays. The gamma rays for low-spin levels (J<5) are mainly from ^{78}Rb decays and for high-spin levels (J>5) from five heavy-ion in-beam γ-ray studies.

[‡] For gamma transitions from low-spin levels (J<5), the assignments are from ce data in ^{78}Rb ε decay; and for transitions from high-spin levels, the assignments are based on γ(θ), γγ(θ)(DCO) and γ(linear pol) measurements in in-beam γ-ray studies covered in four different reaction dataset. When the assignments are

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Adopted Levels, Gammas (continued)

$\gamma(^{78}Kr)$ (continued)

are quadrupole or dipole+quadrupole from angular distribution/ correlation data in in-beam γ-ray experiments, RUL is used to assign E2 or M1+E2. In other cases M1 and E1 are assigned in parentheses when dipole is indicated by angular distribution/correlation data and level J^{π}'s are well established.

[#] From ^{58}Ni(^{23}Na,3pγ),(^{27}Al,α3pγ) (1999Su02) only, not reported In ^{78}Rb ε decay. With the intensity of this γ ray reported In the reaction data, it should have been seen In the ^{78}Rb ε data from 1981Ba40. This discrepancy is difficult to explain. IT is considered As questionable by the evaluators.

[@] From ^{78}Rb ε decay only; not reported In In-beam γ-ray data, probably because of energy limits set In γ-ray spectrum from reactions.

[&] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[a] Multiply placed.

[b] Multiply placed with intensity suitably divided.

[c] Placement of transition in the level scheme is uncertain.

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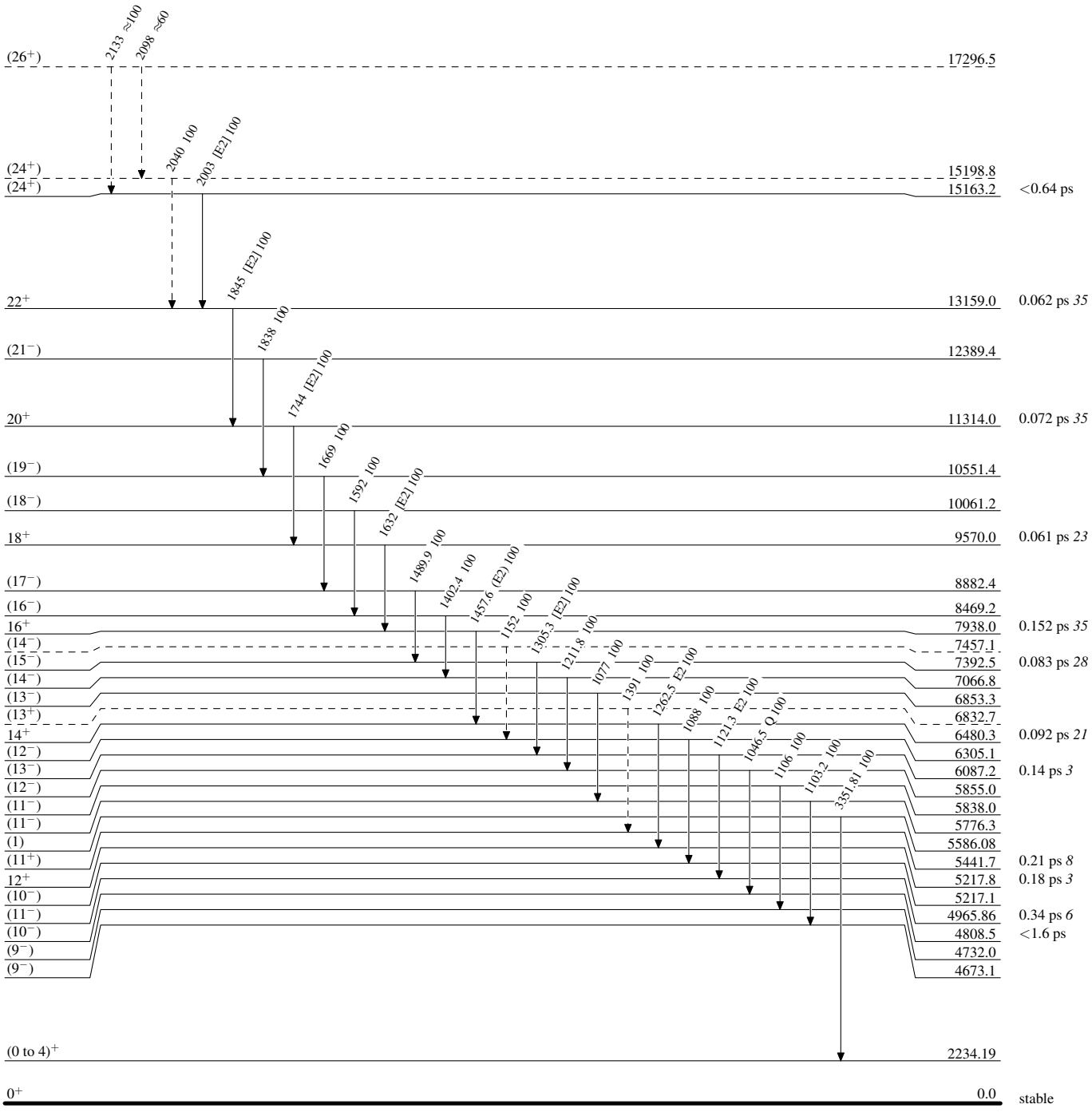
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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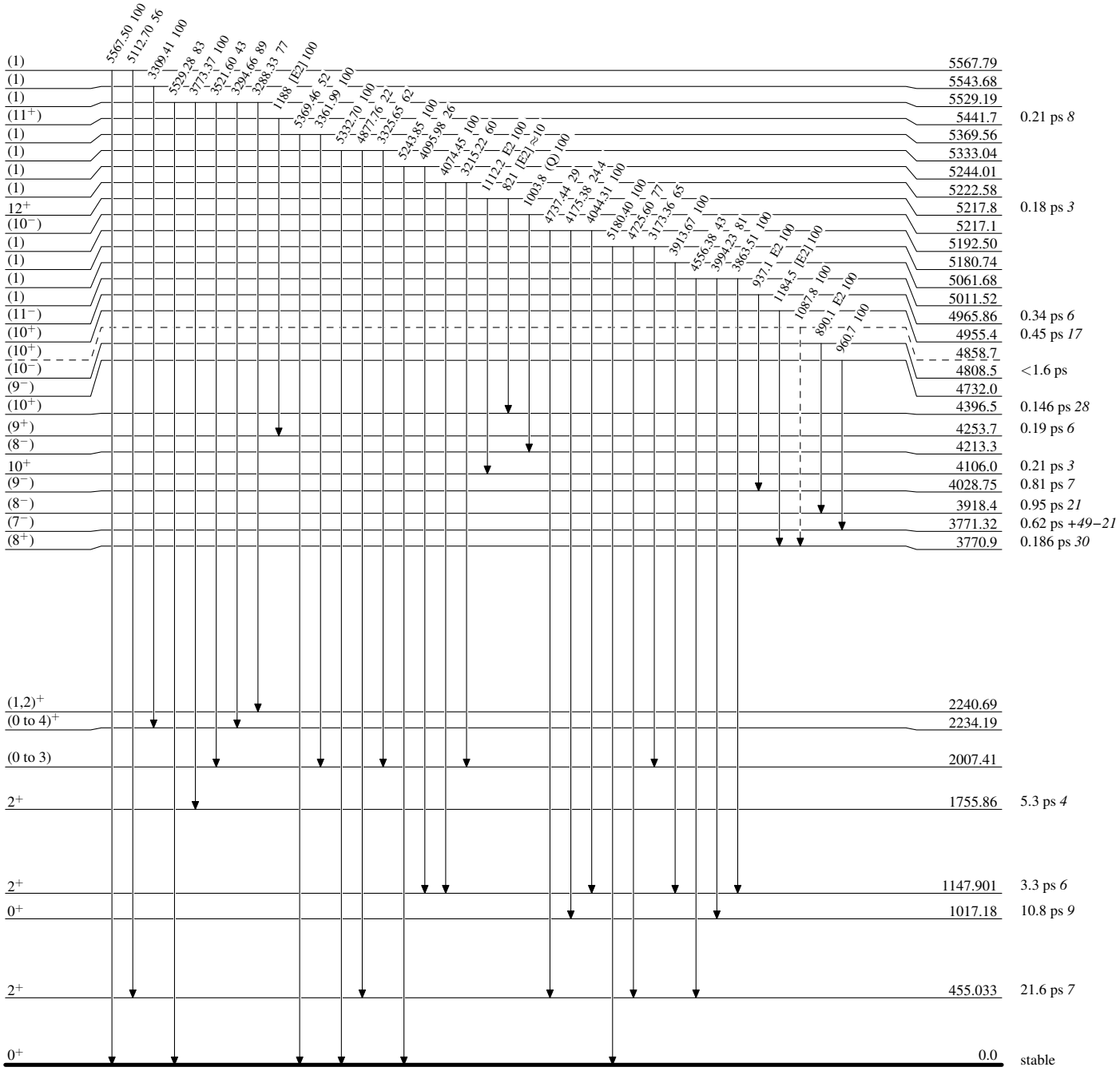
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{78}_{36}Kr_{42}$

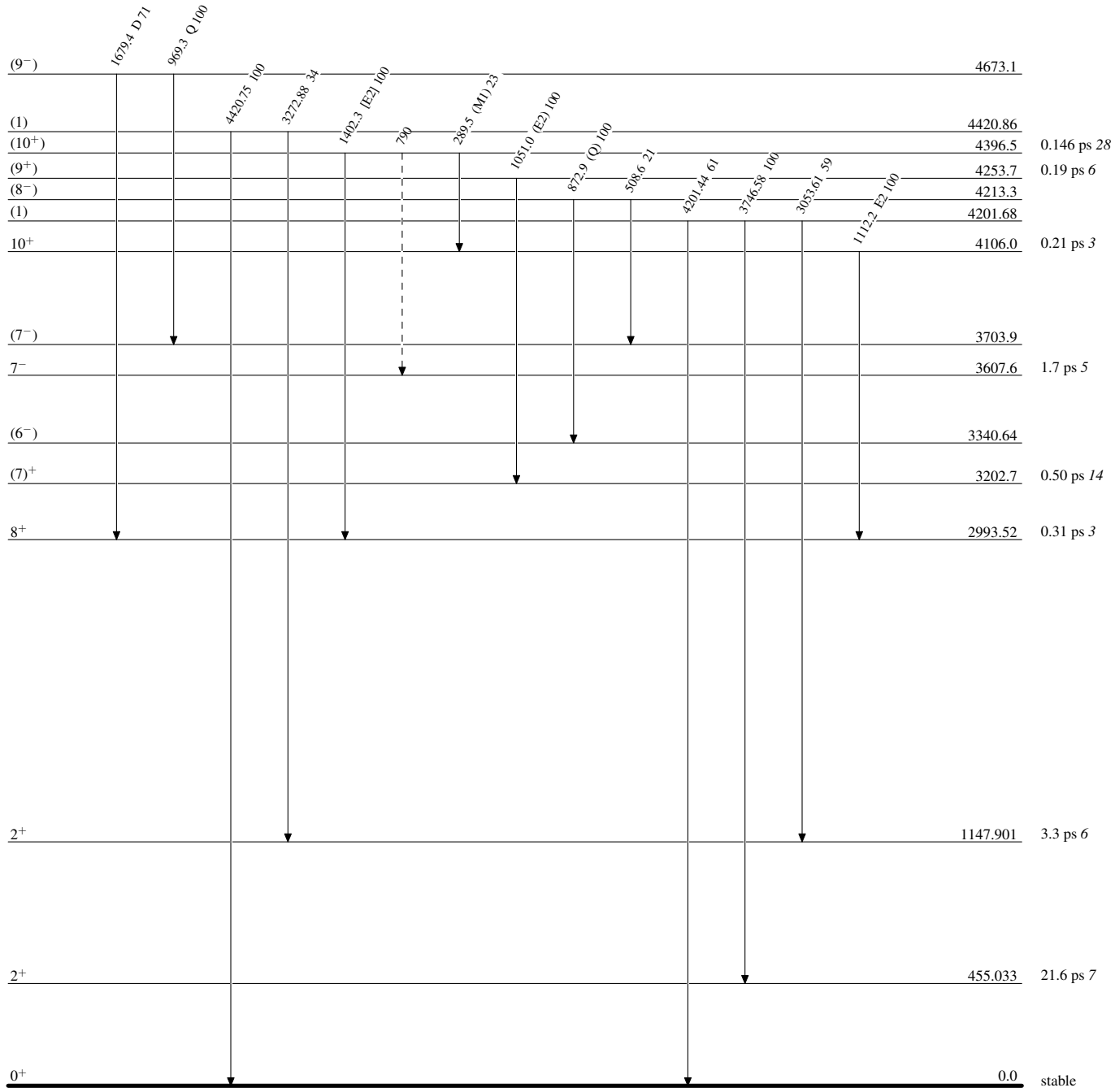
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

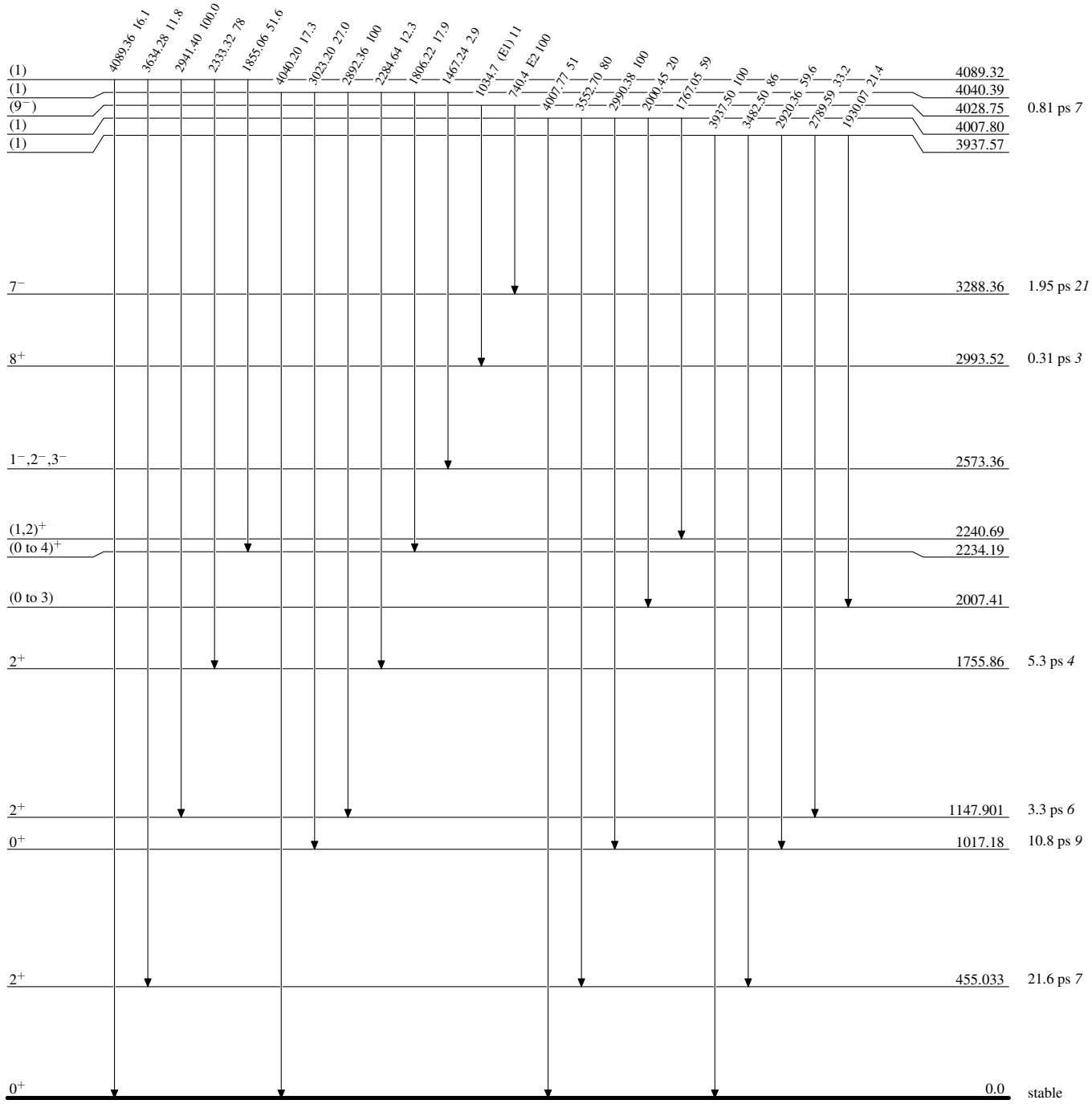


$^{78}_{36}Kr_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

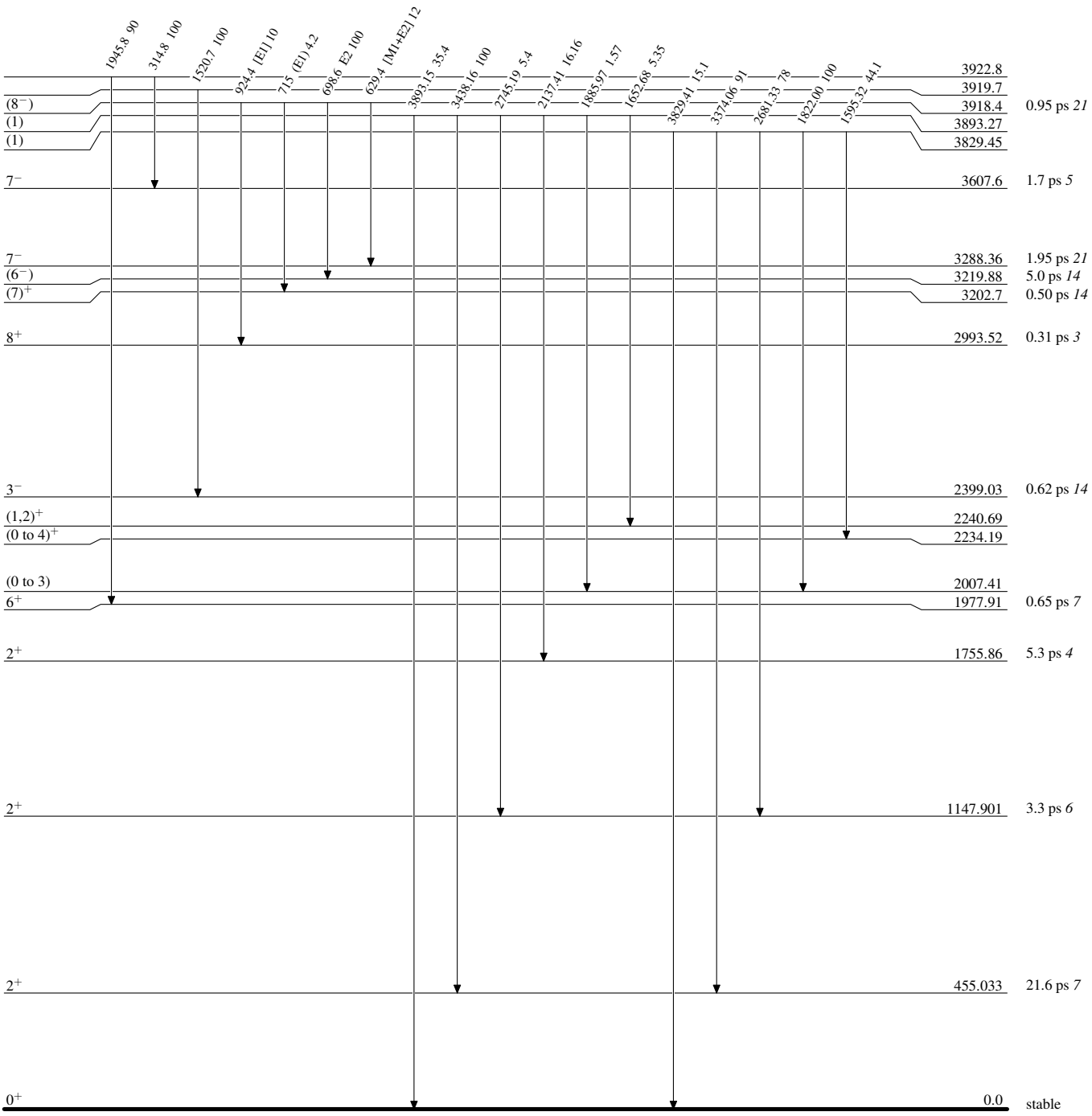


$^{78}_{36}Kr_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



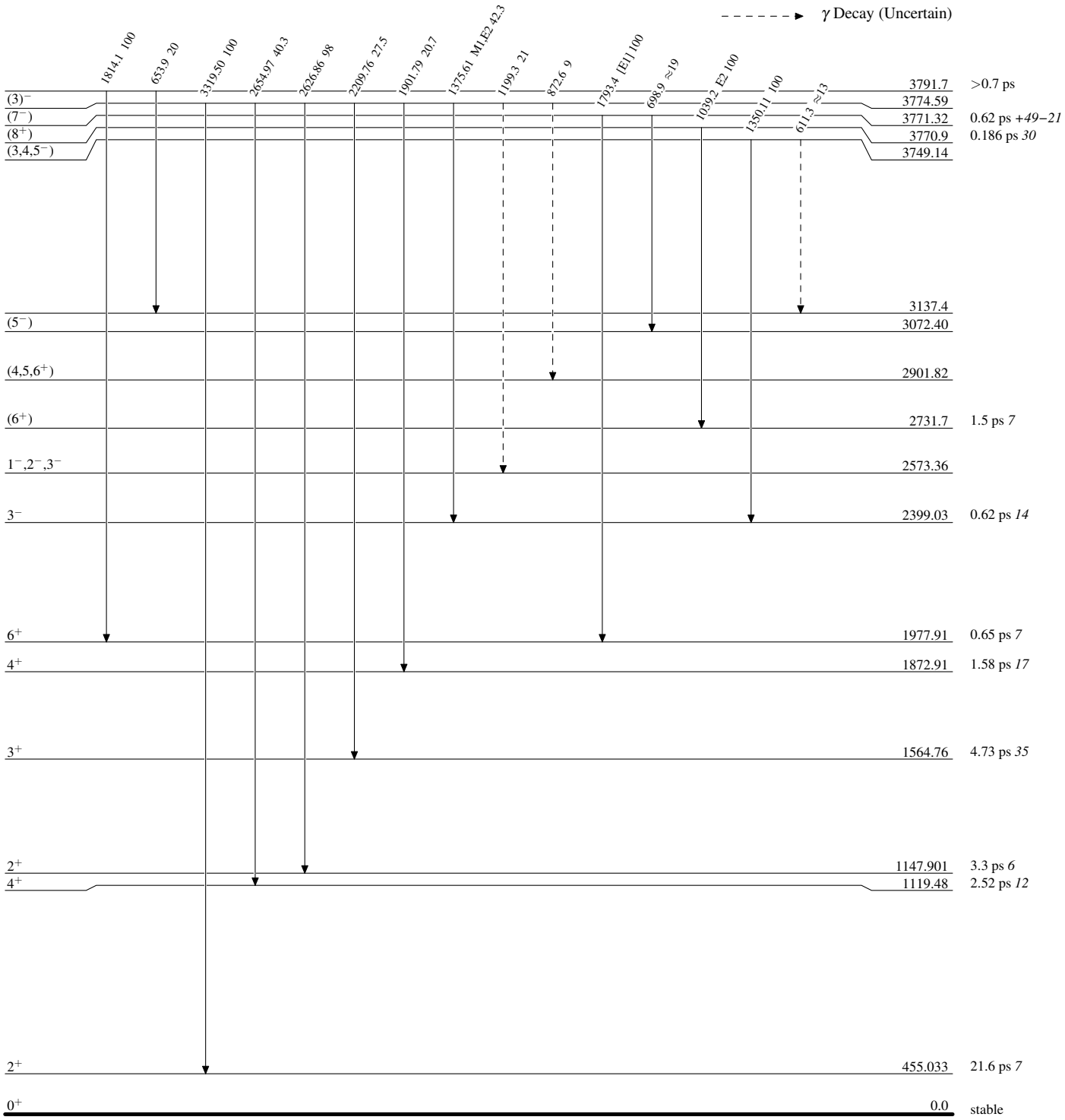
$^{78}_{36}Kr_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend

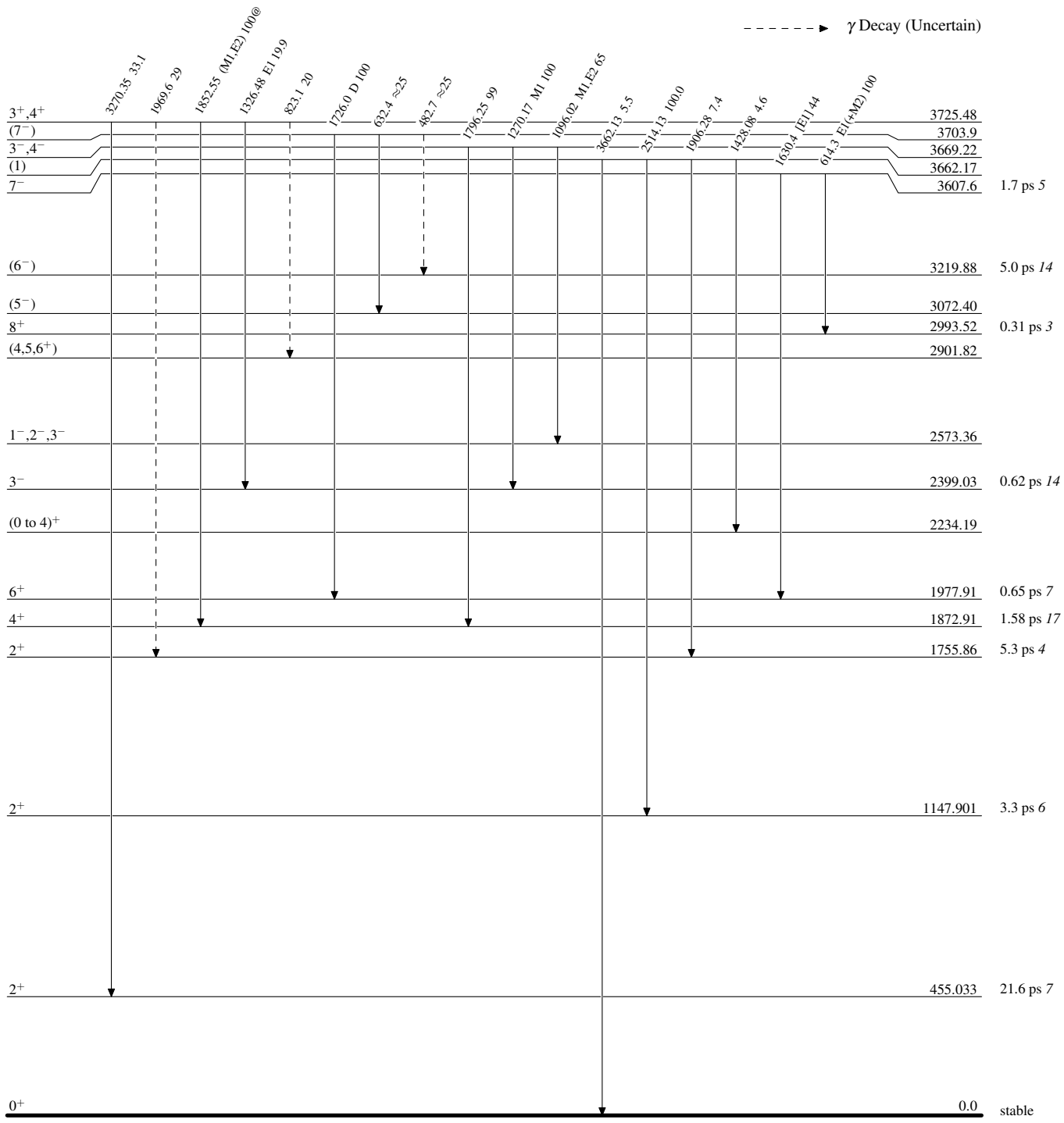


$^{78}_{36}Kr_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

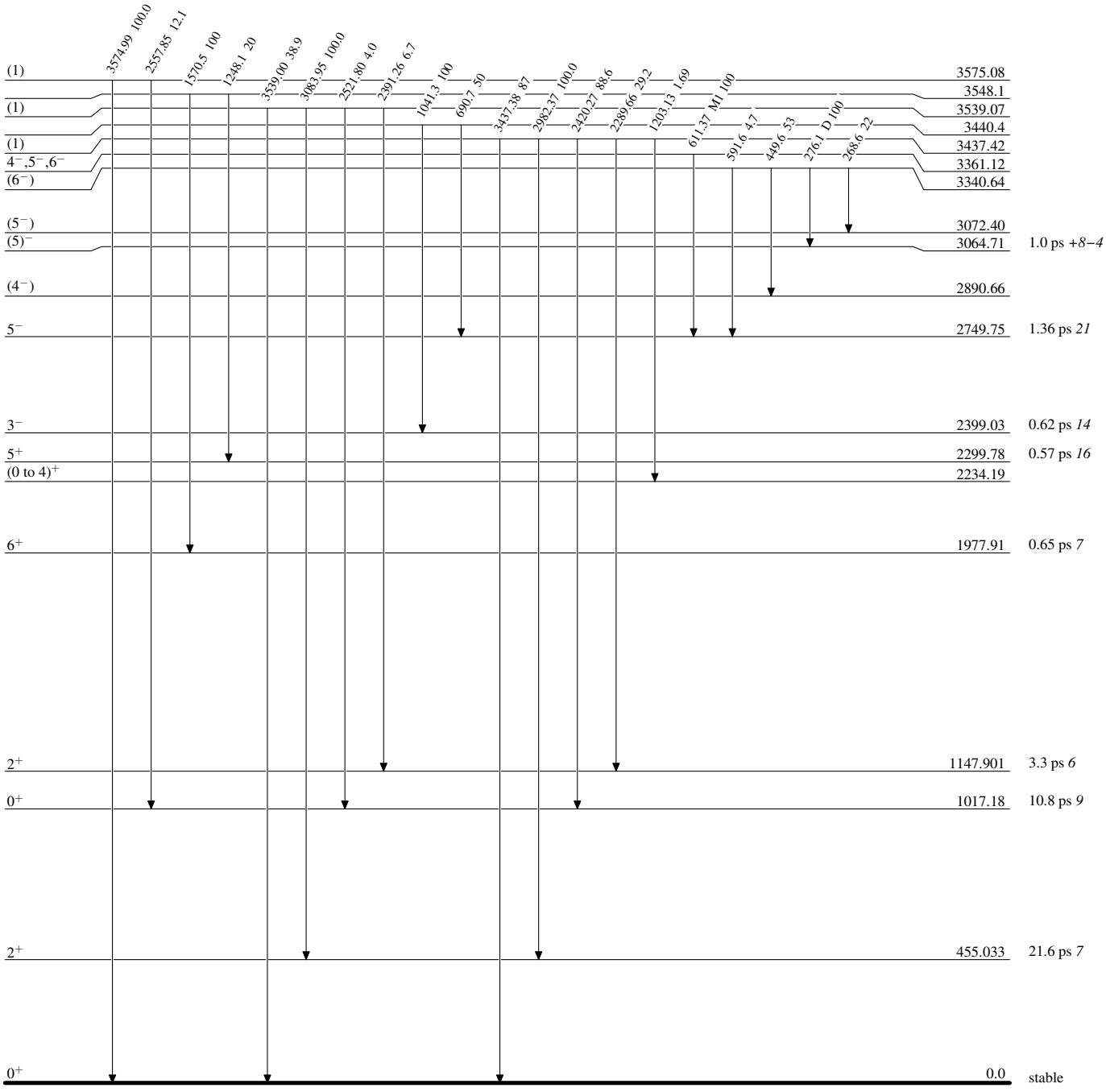


$^{78}_{36}Kr_{42}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{78}_{36}Kr_{42}$

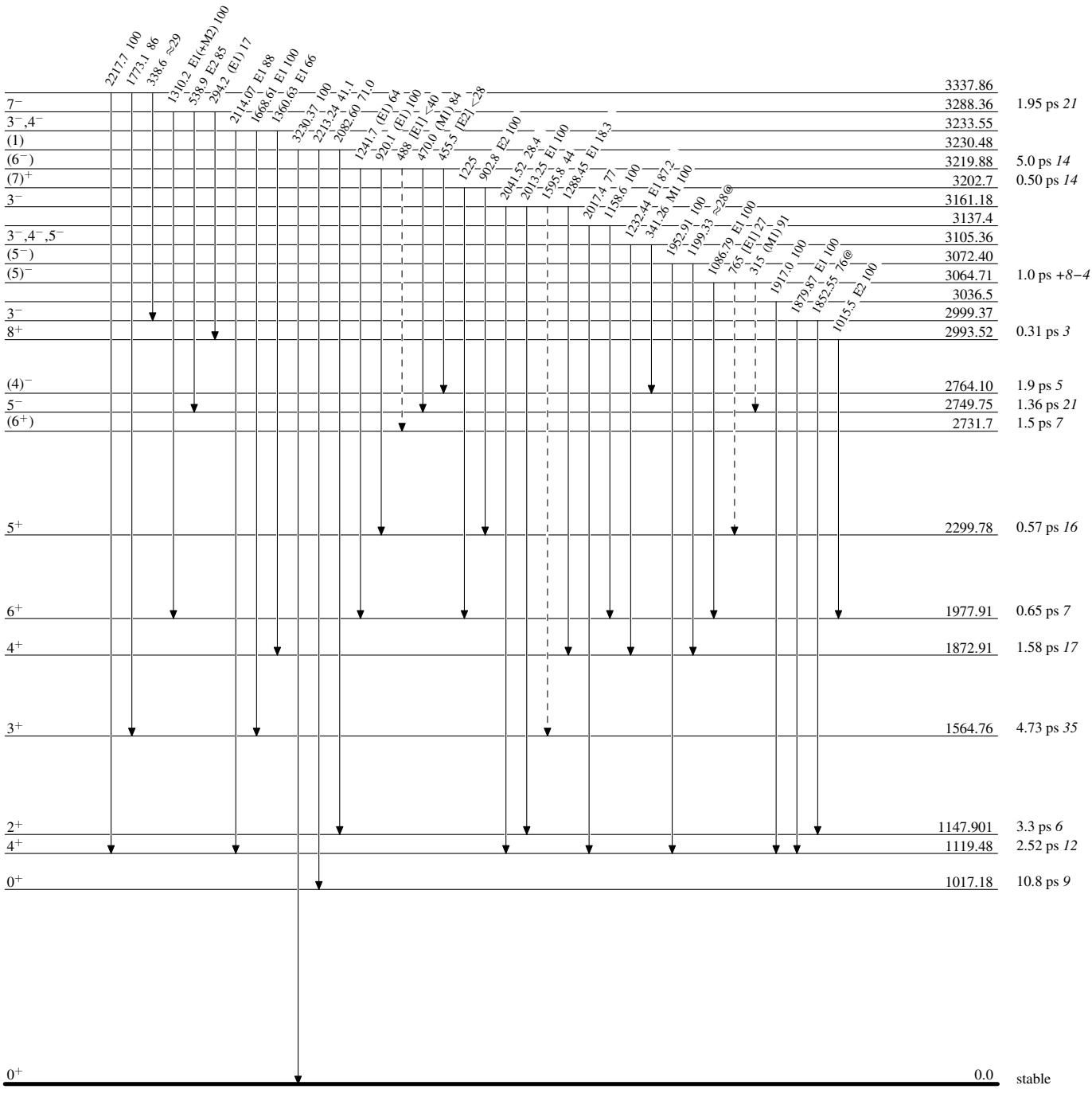
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



$^{78}_{36}Kr_{42}$

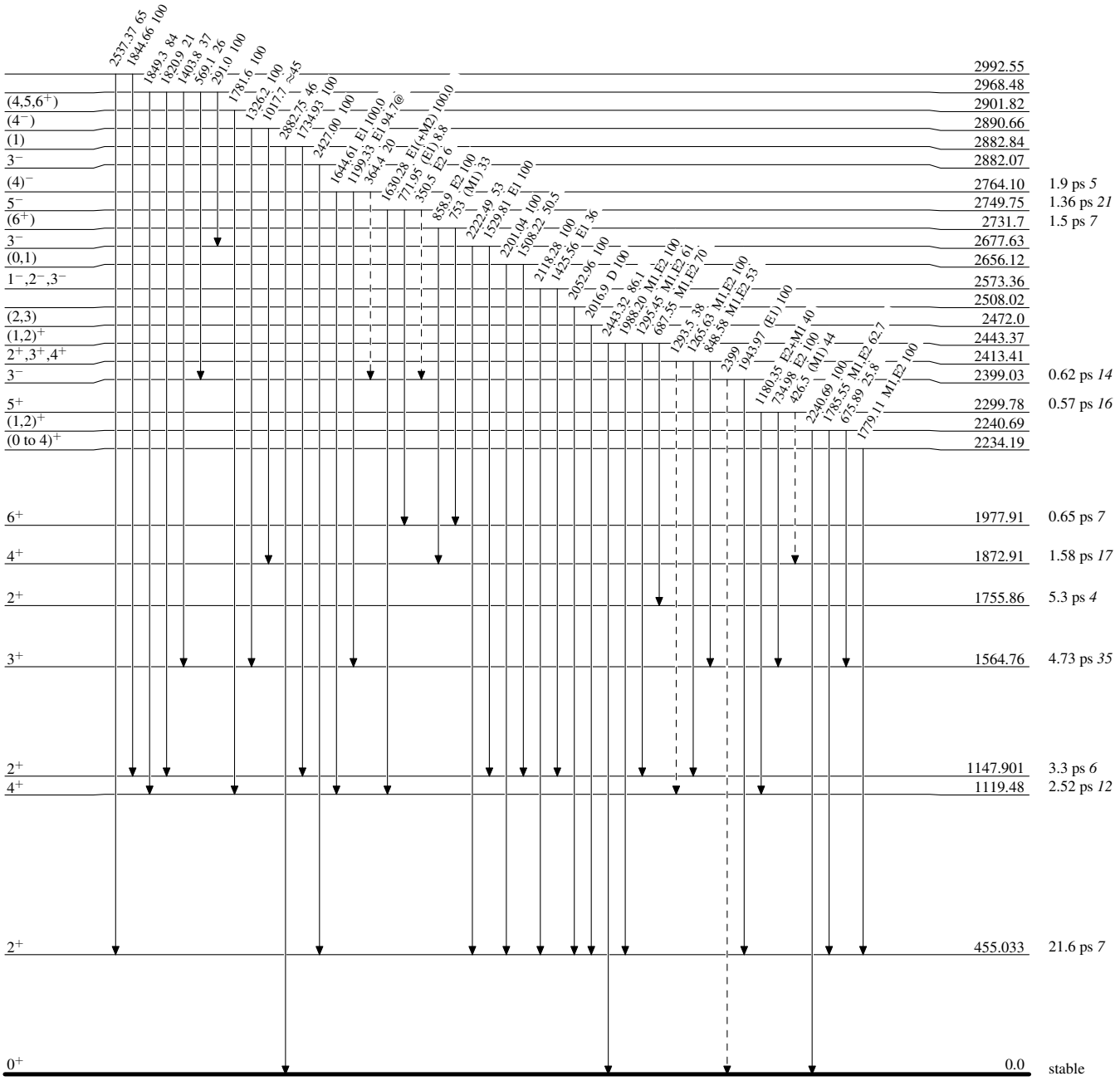
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



$^{78}_{36}Kr_{42}$

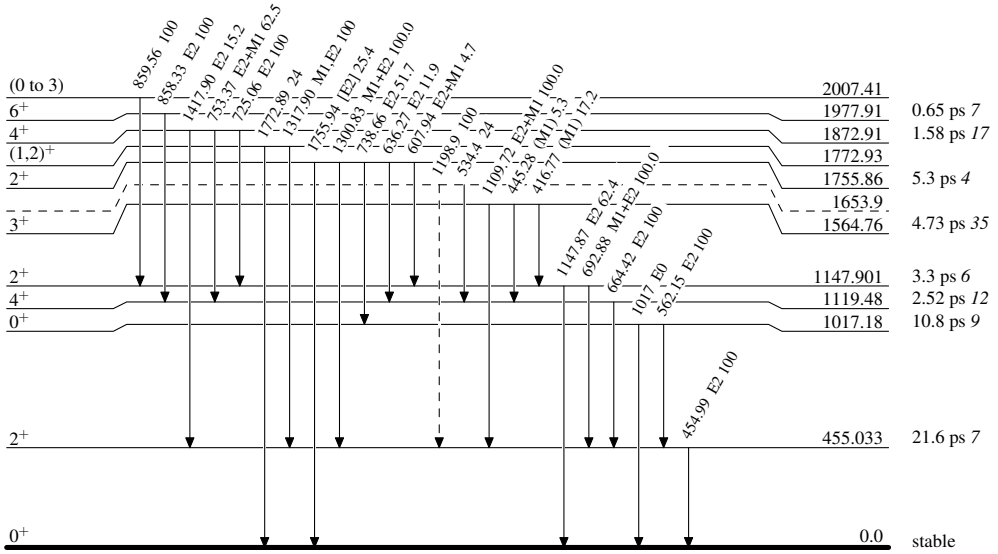
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



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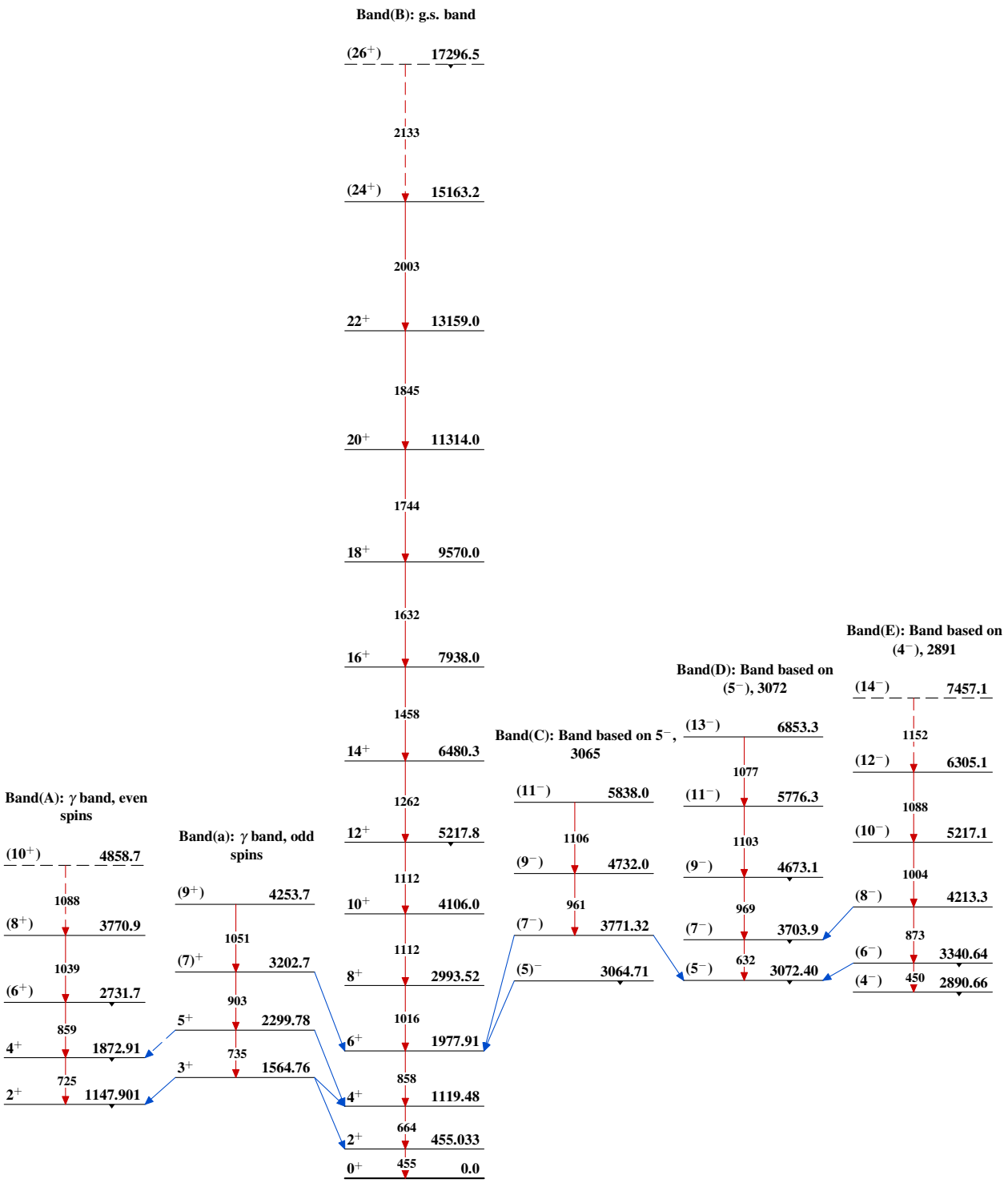
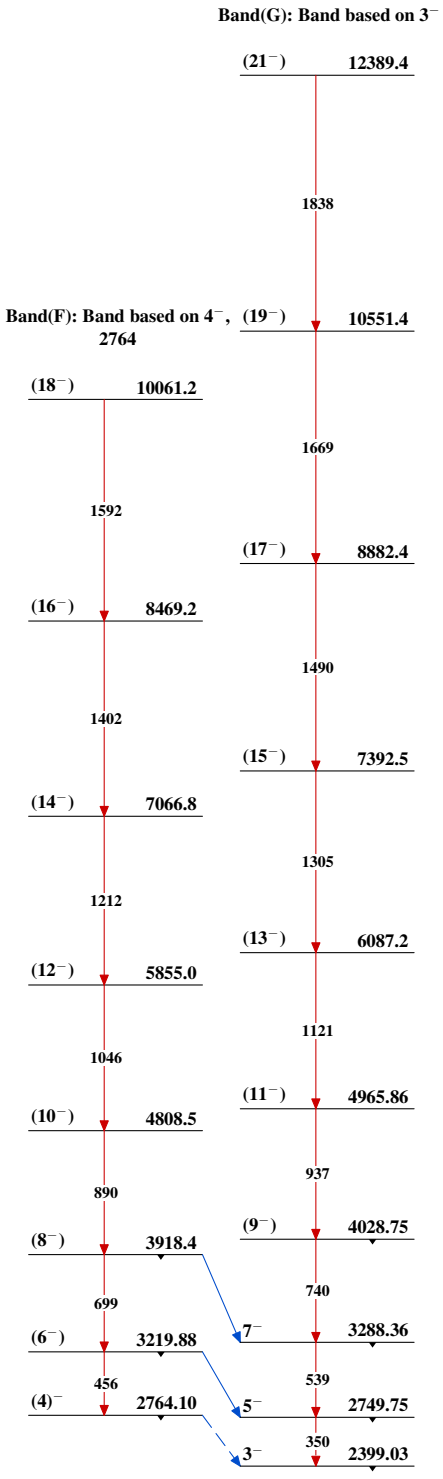
Adopted Levels, Gammas



$^{78}_{36}Kr_{42}$

Adopted Levels, Gammas (continued)



$^{78}_{36}Kr_{42}$