

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen [#]		NDS 126, 1 (2015)	31-Mar-2015

$Q(\beta^-)=1833.4$ 5; $S(n)=9624.7$ 4; $S(p)=9442$ 6; $Q(\alpha)=-9200.1$ 18 [2012Wa38](#)

$S(2n)=17158.5$ 4, $S(2p)=23850$ 40 ([2012Wa38](#)).

Hyperfine studies, isotope shifts, moments, radius: [2014Pa45](#), [2014Kr04](#), [1982To02](#), [1982Du06](#).

[Additional information 1.](#)

Cr(p,X):: [Additional information 2.](#)

Ni(p,X):: [Additional information 3.](#)

Fe(p,X):: [Additional information 4.](#)

Cu(p,X):: [Additional information 5.](#)

$^{43}\text{K}(n,p)$: [Additional information 6.](#)

Ca(p,X):: [Additional information 7.](#)

Ti(p,X):: [Additional information 8.](#)

Cu(γ ,X):: [Additional information 9.](#)

Ni(γ ,X):: [Additional information 10.](#)

Mass Measurements: [2007Ya08](#).

 ^{43}K LevelsCross Reference (XREF) Flags

A	^{43}Ar β^- decay (5.37 min)	E	$^{44}\text{Ca}(\mu^-, \nu n \gamma)$
B	$^9\text{Be}(^{36}\text{S}, n p \gamma)$	F	$^{44}\text{Ca}(d, ^3\text{He})$
C	$^{40}\text{Ar}(\alpha, p \gamma), ^{41}\text{K}(t, p \gamma)$	G	$^{44}\text{Ca}(t, \alpha)$
D	$^{41}\text{K}(t, p)$	H	$^{44}\text{Ca}(^{11}\text{B}, ^{12}\text{C})$

E(level) [†]	J ^π [#]	T _{1/2} [‡]	XREF	Comments
0	3/2 ⁺	22.3 h 1	ABCDEFGH	$\% \beta^- = 100$ $\mu = +0.1633$ 8 (1982To02 , 2014StZZ) μ : ABLDS method (1982To02 , 1982Du06). Other: 1959Pe26 . Evaluated rms charge radius = 3.4556 fm 86 (2013An02). Adopted (by 1977En02) spectroscopic factor $S=4.0$ 15 (proton pickup). Additional information 11. $\delta \langle r^2 \rangle(^{47}\text{K}, ^{43}\text{K}) = +0.049$ fm ² 19(stat) 69(syst) (2014Kr04) for $\delta \nu(^{39}\text{K}, ^{43}\text{K}) = +459.0$ MHz 12 from literature. T _{1/2} : weighted average of 21.75 h 50 (1963Ho17), 22.1 h 1 (1972Em01), and 22.6 h 2 (1972Wa20). Other: 1955Ne01 , 1969Ta07 . J ^π : spin from atomic-beam method; also from fitting of hyperfine structure (2014Pa45 , 2014Kr04); parity from L(t,p)=0; L(d, ³ He)=L(t,α)=2. Configuration = $\pi 1d_{3/2}^{-1}$ (92%) (2014Pa45) from shell-model calculations. Adopted (by 1977En02) spectroscopic factor $S=1.9$ 5 (proton pickup). J ^π : L(d, ³ He)=0. $\mu = +4.43$ 5 (1983Ra37 , 2014StZZ) XREF: F(748). μ : TDPAD method (1983Ra37). Others: 1976We23 , 1976De41 . J ^π : L(d, ³ He)=L(t,α)=3; 5/2 ruled out by $\Delta J=2$ to 3/2 ⁺ from $\gamma(\theta, \text{pol})$ in (α, p γ). T _{1/2} : from p γ(t) in (α, p γ). XREF: D(1007)H(984). J ^π : L(d, ³ He)=1; L(t,p)=3. XREF: F(1119)H(1121). J ^π : L(d, ³ He)=L(t,α)=L(t,p)=2; 5/2 not allowed by RUL for γ to 1/2 ⁺ .
561.20 ^{&} 5	1/2 ⁺	1.4 ps +17-7	ABCDEFGH	
738.30 ^a 6	7/2 ⁻	200 ns 5	ABC EFGH	
975.32 6	3/2 ⁻	1.6 ps +14-6	ABCDEFGH	
1109.93 6	3/2 ⁺	1.0 ps 8	ABCDEFGH	

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Adopted Levels, Gammas (continued) ^{43}K Levels (continued)

E(level) [†]	J ^π [#]	T _{1/2} [‡]	XREF	Comments
1206.91 6	(5/2,7/2) ⁺	>4.8 ps	ABCD G	J ^π : L(t,p)=2 from 3/2 ⁺ ; γ from 7/2 ⁺ probably not E2 from RUL; L(t,α)=(2) supports 5/2 ⁺ .
1509.99& 6	7/2 ⁺	5.7 ps 15	ABCD	J ^π : L(t,p)=2 from 3/2 ⁺ and ΔJ=2, E2 to 3/2 ⁺ from γ(θ,pol) in (α,pγ).
1549.96 9	3/2 ⁺ ,5/2 ⁺ @	0.09 ps 6	A C FG	J ^π : L(d, ³ He)=2.
1815 10	(5/2 to 11/2) ⁺		D	J ^π : L(t,p)=4 from 3/2 ⁺ .
1849.57 ^a 8	11/2 ⁻	4.6 ps 12	BC G	J ^π : stretched E2 to 7/2 ⁻ from γ(θ,pol) in (α,pγ).
1865.65 8	(3/2,5/2 ⁺)		A C F	J ^π : γ to 1/2 ⁺ , log ft=7.7 from 5/2 ⁽⁻⁾ parent.
1956 10	(5/2 to 11/2) ⁺		D	J ^π : L(t,p)=4 from 3/2 ⁺ .
1986.57 8	(9/2)		BC	XREF: C(?).
2035 10	3/2 ⁺		D	J ^π : ΔJ=1 stretched dipole to 7/2 ⁺ .
2048.88 9	(9/2)	1.7 ps 6	ABC	J ^π : L(t,p)=0 from 3/2 ⁺ .
2081.0 4	(5/2,7/2) ⁺		B D	J ^π : γ to 7/2 ⁻ and RUL; ΔJ=1 stretched dipole to 7/2 ⁺ .
2177.68 11	5/2 ⁽⁺⁾	<0.07 ps	A C fg	J ^π : L(t,p)=4 from 3/2 ⁺ ; γ to 3/2 ⁺ .
2189.32 14	(3/2,5/2,7/2)		A fg	J ^π : γ decays to 3/2 ⁻ , 3/2 ⁺ , 7/2 ⁻ and 7/2 ⁺ ; L(t,α)=(2). But the parity is inconsistent with log ft=5.8 from 5/2 ⁽⁻⁾ parent.
2218 10	(3/2 to 9/2) ⁻		D	J ^π : γ to 3/2 ⁺ ; log ft=7.4 from 5/2 ⁽⁻⁾ parent. L(t,α)=(2) for a 2180 group gives (3/2 ⁺ ,5/2 ⁺) for one of the levels near this energy.
2344.96 9	(3/2 ⁻)	0.7 ps +14-4	A C	J ^π : L(t,p)=3 from 3/2 ⁺ .
2451 10	1/2 ⁺		FG	J ^π : γ decays to 1/2 ⁺ and (5/2,7/2) ⁺ ; log ft=5.6 from 5/2 ⁽⁻⁾ parent.
2508.34& 10	(11/2 ⁺)	>5 ps	BCD	T=5/2 J ^π : L(³ He,d)=L(t,α)=0.
2548 10	(1/2,3/2,5/2) ⁻		D	J ^π : L(t,p)=(4) from 3/2 ⁺ ; ΔJ=2, Q γ to 7/2 ⁺ ; possible positive-parity yrast band member.
2668 15	3/2 ⁺ ,5/2 ⁺ @		FG	J ^π : L(t,p)=1 from 3/2 ⁺ .
2784 10	(1/2 to 7/2) ⁺		D	J ^π : L(t,p)=2 from 3/2 ⁺ .
2879 10	(1/2 to 7/2) ⁺		D	J ^π : L(t,p)=2 from 3/2 ⁺ .
2981 15			G	
2986.76 19	(13/2 ⁻)		B	J ^π : probably high spin formed in coupling an f _{7/2} proton with four f _{7/2} neutrons in a 4 ⁺ configuration.
3057.26 21	(5/2) ⁺		A fG	J ^π : L(d, ³ He)=2; γ to 7/2 ⁻ .
3084 15	3/2 ⁺ ,5/2 ⁺		fG	J ^π : L(d, ³ He)=2.
3114.69 ^a 10	15/2 ⁻	3.5 ps 7	BC	J ^π : stretched E2 to 11/2 ⁻ from γ(θ,pol) in (α,pγ).
3139.39 10	(13/2)		BC	J ^π : ΔJ=1 stretched dipole to (11/2).
3150 18			G	
3190 10	(1/2 to 7/2) ⁺		D	J ^π : L(t,p)=2 from 3/2 ⁺ .
3229 15	3/2 ⁺ ,5/2 ⁺ @		FG	
3264.34 11	(3/2,5/2) ⁺		A D	XREF: D(3254).
3309.86 13	(3/2,5/2) ⁺		A D	J ^π : γ to 1/2 ⁺ ; L(t,p)=2 from 3/2 ⁺ ; log ft=5.9 from 5/2 ⁽⁻⁾ parent.
3342 15	3/2 ⁺ ,5/2 ⁺ @		FG	J ^π : γ decays to 3/2 ⁻ , 3/2 ⁺ and (5/2,7/2) ⁺ ; L(t,p)=2 from 3/2 ⁺ ; log ft=5.1 from 5/2 ⁽⁻⁾ parent is inconsistent with positive parity.
3393.14 20	(3/2 to 7/2) ⁺		A D	J ^π : L(t,p)=2 from 3/2 ⁺ ; log ft=6.2 from 5/2 ⁽⁻⁾ parent.
3455.60 12	(3/2 ⁻)		A G	J ^π : γ to 1/2 ⁺ ; log ft=5.1 from 5/2 ⁽⁻⁾ parent.
3580 30			G	
3591.28& 10	(15/2 ⁺)		B	J ^π : ΔJ=2 stretched quadrupole to (11/2 ⁺) from DCO ratios possible positive-parity yrast band member in.
3608.46 15	(5/2 ⁻ ,7/2 ⁻)		A	J ^π : log ft=5.1 from 5/2 ⁽⁻⁾ parent; γ transitions to 7/2 ⁻ and 7/2 ⁺ .
3646.1 4	(3/2,5/2,7/2 ⁺)		A G	J ^π : γ transitions to 3/2 ⁺ and (5/2,7/2) ⁺ ; log ft=5.9 from 5/2 ⁽⁻⁾ .
3714.16 22	(3/2 ⁺ ,5/2 ⁺)		A FG	XREF: F(3730).
3837 15			G	J ^π : γ transitions to 3/2 ⁺ , 3/2 ⁻ and (5/2,7/2) ⁺ ; L(d, ³ He)=(2); log ft=5.6 from 5/2 ⁽⁻⁾ is inconsistent with positive parity.

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Adopted Levels, Gammas (continued) ^{43}K Levels (continued)

E(level) [†]	J ^π #	XREF	Comments
3880 15	(3/2 ⁺ ,5/2 ⁺)	FG	J ^π : L(d, ³ He)=(2).
3970? 30		G	
3985.28 25		B	
4018 15	3/2 ⁺ ,5/2 ⁺ @	FG	
4070 30		G	
4124 15	3/2 ⁺ ,5/2 ⁺ @	FG	J ^π : L(d, ³ He)=2; but L(t,α)=(0) is inconsistent.
4177 15		G	
4234 15		G	
4290 30		G	
4410 40		G	
4472 15	3/2 ⁺ ,5/2 ⁺ @	FG	
4540 40		G	
4540.4 3		B	
4680? 40		G	
4794 15	3/2 ⁺ ,5/2 ⁺ @	FG	
4860? 40		G	
4920? 40		G	
4930.3 3	(19/2 ⁻)	B	J ^π : comparison with negative-parity levels of ⁴⁵ Sc suggests that the 1816 keV transition corresponds to the decay of a 19/2 ⁻ level to the 15/2 ⁻ level at 3116 keV (1998Mo16).
5030 40		G	
5150? 40		G	
5194 30	3/2 ⁺ ,5/2 ⁺ @	FG	
5260 40		G	
5380 40		G	
5610 30	3/2 ⁺ ,5/2 ⁺ @	F	
5900 30	3/2 ⁺ ,5/2 ⁺ @	F	
7450 30	(3/2 ⁺ ,5/2 ⁺)	F	J ^π : L(d, ³ He)=(2).

[†] From least-squares fit to E_γ data for levels populated in γ-ray studies. For others, weighted averages of available values are taken.

[‡] From DSAM in (α,pγ),(t,pγ), unless otherwise stated.

When L-transfer arguments are used, the target is J^π=0⁺, except for ⁴¹K(t,p), where target J^π=3/2⁺. Arguments based on log ft values are considered as tentative since the decay scheme of ⁴³Ar decay is not considered as well established.

@ L(d,³He) and/or L(t,α)=2.

& Band(A): Possible positive-parity yrast band. Band from 1992Ko15.

^a Band(B): Possible negative-parity yrast band. Band from 1992Ko15.

γ(⁴³K)

E _i (level)	J _i ^π	E _γ [†]	I _γ [‡]	E _f	J _f ^π	Mult.#	δ [#]	Comments
561.20	1/2 ⁺	561.10 5	100	0	3/2 ⁺			
738.30	7/2 ⁻	738.23 6	100	0	3/2 ⁺	M2+E3	-0.13 2	B(M2)(W.u.)=0.0567 15; B(E3)(W.u.)=7.7 24
975.32	3/2 ⁻	414.0 1	4.3 3	561.20	1/2 ⁺	[E1]		B(E1)(W.u.)=0.00020 +8-18
		975.3 1	100.0 3	0	3/2 ⁺	[E1]		B(E1)(W.u.)=0.00036 +14-32
								Additional information 12.
1109.93	3/2 ⁺	548.62 6	43 5	561.20	1/2 ⁺			
		1110.1 1	100 5	0	3/2 ⁺			
1206.91	(5/2,7/2) ⁺	1206.95 9	100	0	3/2 ⁺			

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Adopted Levels, Gammas (continued)

$\gamma(^{43}\text{K})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]	$\delta^\#$	Comments
1509.99	7/2 ⁺	303.09 5	9 2	1206.91	(5/2,7/2) ⁺			
		1510.05 7	100 2	0	3/2 ⁺	E2		B(E2)(W.u.)=1.3 4
1549.96	3/2 ⁺ ,5/2 ⁺	439.3 3	12 2	1109.93	3/2 ⁺			
		1550.0 1	100 2	0	3/2 ⁺			
1849.57	11/2 ⁻	1111.14 6	100	738.30	7/2 ⁻	E2		B(E2)(W.u.)=8.1 22
1865.65	(3/2,5/2 ⁺)	755.0 3	1.5 5	1109.93	3/2 ⁺			
		890.4 1	100 3	975.32	3/2 ⁻			
		1304.3 7	2.6 5	561.20	1/2 ⁺			
		1866.1 2	59 3	0	3/2 ⁺			
1986.57	(9/2)	476.58 6	100	1509.99	7/2 ⁺	D		
2048.88	(9/2)	1310.58 7	100	738.30	7/2 ⁻	D		Additional information 13.
2081.0	(5/2,7/2) ⁺	873.9 4	100 24	1206.91	(5/2,7/2) ⁺			
		2081.3 7	66 22	0	3/2 ⁺			
2177.68	5/2 ⁽⁺⁾	667.5 3	0.53 13	1509.99	7/2 ⁺			
		1202.4 3	30 5	975.32	3/2 ⁻			
		1439.8 2	100 5	738.30	7/2 ⁻			
		2176.2 7	0.79 13	0	3/2 ⁺			
2189.32	(3/2,5/2,7/2)	639.7 3	13.5 14	1549.96	3/2 ⁺ ,5/2 ⁺			
		1080.0 3	22 4	1109.93	3/2 ⁺			
		2189.2 3	100 4	0	3/2 ⁺			
2344.96	(3/2 ⁻)	167.1 2	1.13 13	2177.68	5/2 ⁽⁺⁾			
		479.2 2	53 3	1865.65	(3/2,5/2 ⁺)			
		1138.1 2	3.8 8	1206.91	(5/2,7/2) ⁺			
		1235.7 3	2.8 5	1109.93	3/2 ⁺			
		1369.9 2	90 5	975.32	3/2 ⁻			
		1783.7 2	5.6 5	561.20	1/2 ⁺			
		2344.5 2	100 5	0	3/2 ⁺			
2508.34	(11/2 ⁺)	460.5 6	100 3	2048.88	(9/2)	D+Q	-0.2	
		998.81 13	69 4	1509.99	7/2 ⁺	Q		
2986.76	(13/2 ⁻)	478.39 16	100	2508.34	(11/2 ⁺)			
3057.26	(5/2) ⁺	2318.9 2	100	738.30	7/2 ⁻			
3114.69	15/2 ⁻	1265.09 7	100	1849.57	11/2 ⁻	E2		B(E2)(W.u.)=5.6 12
3139.39	(13/2)	630.86 12	13.4 18	2508.34	(11/2 ⁺)	D(+Q)		
		1289.62 8	100 12	1849.57	11/2 ⁻	D		
3264.34	(3/2,5/2) ⁺	1398.7 1	63 4	1865.65	(3/2,5/2 ⁺)			
		2287.6 5	33 6	975.32	3/2 ⁻			E _γ : poor fit; Δ(E _γ) was increased from 0.2 to 0.5 by evaluators.
		3264.3 2	100 6	0	3/2 ⁺			
3309.86	(3/2,5/2) ⁺	1121.0 3	4.0 18	2189.32	(3/2,5/2,7/2)			
		1132.6 2	15 3	2177.68	5/2 ⁽⁺⁾			
		1443	60 12	1865.65	(3/2,5/2 ⁺)			
		2102.3 5	12 3	1206.91	(5/2,7/2) ⁺			
		2333.9 2	100 12	975.32	3/2 ⁻			
		3309.9 3	9.2 12	0	3/2 ⁺			
3393.14	(3/2 to 7/2) ⁺	3393.0 2	100	0	3/2 ⁺			
3455.60	(3/2 ⁻)	1277.9 5	3.8 6	2177.68	5/2 ⁽⁺⁾			
		1590.4 2	16.2 16	1865.65	(3/2,5/2 ⁺)			
		1905.9 6	6.0 11	1549.96	3/2 ⁺ ,5/2 ⁺			
		2345	1.9 6	1109.93	3/2 ⁺			
		2479.9 2	100 3	975.32	3/2 ⁻			
		2894.2 2	27 2	561.20	1/2 ⁺			
		3455.1 4	3.0 17	0	3/2 ⁺			
3591.28	(15/2 ⁺)	451.82 4	72.6 19	3139.39	(13/2)	D+Q	-0.2	
		476.4 3	11 5	3114.69	15/2 ⁻	D		

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Adopted Levels, Gammas (continued)

$\gamma(^{43}\text{K})$ (continued)						
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]
3591.28	(15/2 ⁺)	1083.15 7	100 11	2508.34	(11/2 ⁺)	Q
3608.46	(5/2 ⁻ , 7/2 ⁻)	1419.3 2	100 9	2189.32	(3/2, 5/2, 7/2)	
		1559.9 @ 2	147 22	2048.88	(9/2)	
		2057.9 3	83 9	1549.96	3/2 ⁺ , 5/2 ⁺	
		2097.8 5	76 15	1509.99	7/2 ⁺	
		2401.8 3	22 5	1206.91	(5/2, 7/2) ⁺	
		2870.1 3	58 7	738.30	7/2 ⁻	
3646.1	(3/2, 5/2, 7/2 ⁺)	2438.9 5	100 5	1206.91	(5/2, 7/2) ⁺	
		2535.7 7	18 5	1109.93	3/2 ⁺	
		3646.4 5	7.3 16	0	3/2 ⁺	
3714.16	(3/2 ⁺ , 5/2 ⁺)	1369	4.3 25	2344.96	(3/2 ⁻)	
		2506.7 15	10 3	1206.91	(5/2, 7/2) ⁺	
		2603.4 4	10 4	1109.93	3/2 ⁺	
		2739.5 7	22 4	975.32	3/2 ⁻	
		3714.3 3	100 6	0	3/2 ⁺	
3985.28		1477.0 3	100 20	2508.34	(11/2 ⁺)	
		1936.4 5	64 17	2048.88	(9/2)	
4540.4		555.2 3	100 22	3985.28		
		1401.0 5	86 22	3139.39	(13/2)	
		1553.1 6	93 22	2986.76	(13/2 ⁻)	
4930.3	(19/2 ⁻)	1815.61 26	100 15	3114.69	15/2 ⁻	

[†] From β^- decay, ($\alpha, p\gamma$), ($t, p\gamma$) and ($^{36}\text{S}, n p\gamma$).

[‡] Primarily from β^- decay. Weighted averages are taken when values with uncertainties are also available from $^9\text{Be}(^{36}\text{S}, n p\gamma)$, ($\alpha, p\gamma$), ($t, p\gamma$).

[#] From ($\alpha, p\gamma$), ($t, p\gamma$) and ($^{36}\text{S}, n p\gamma$).

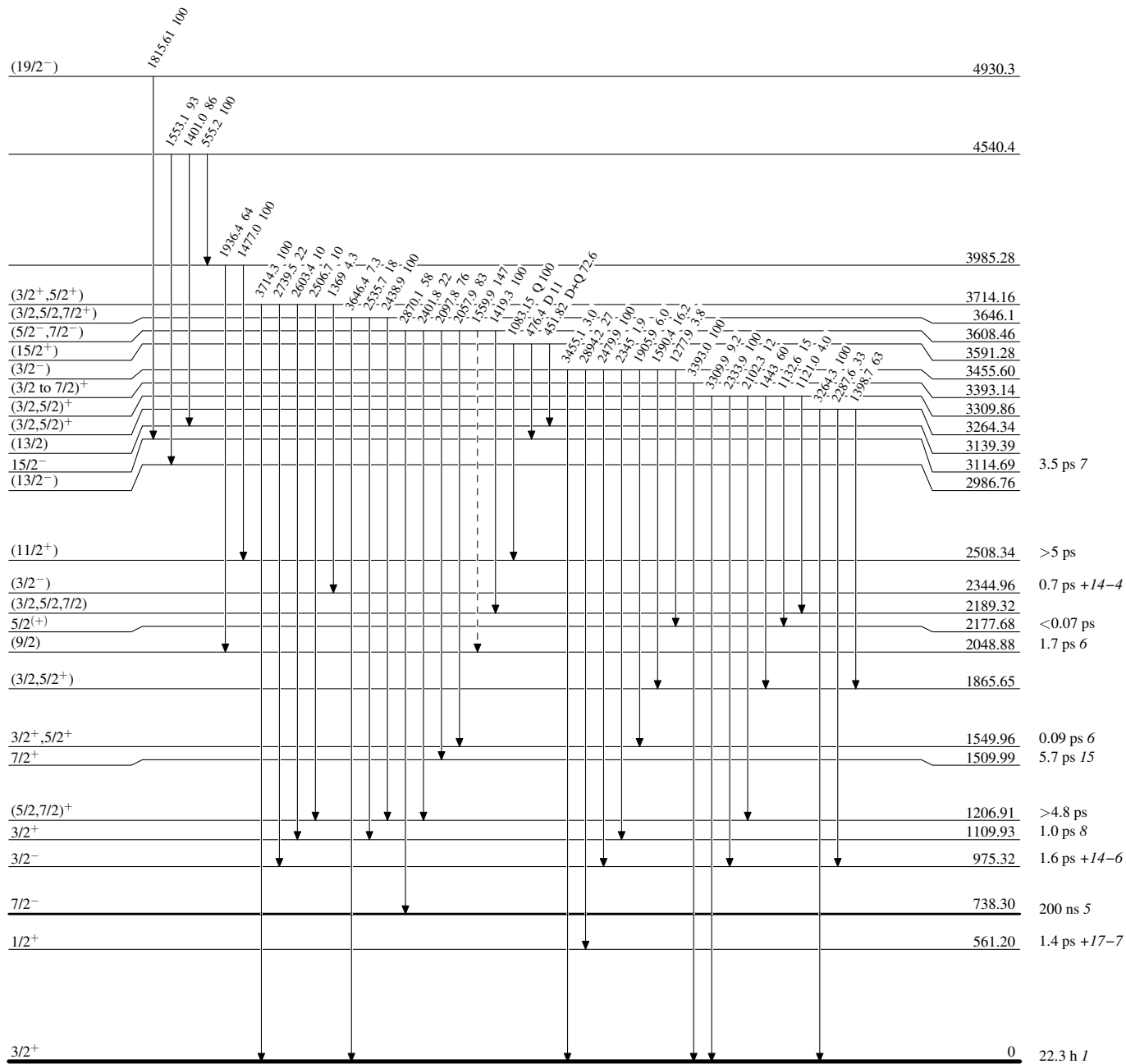
@ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

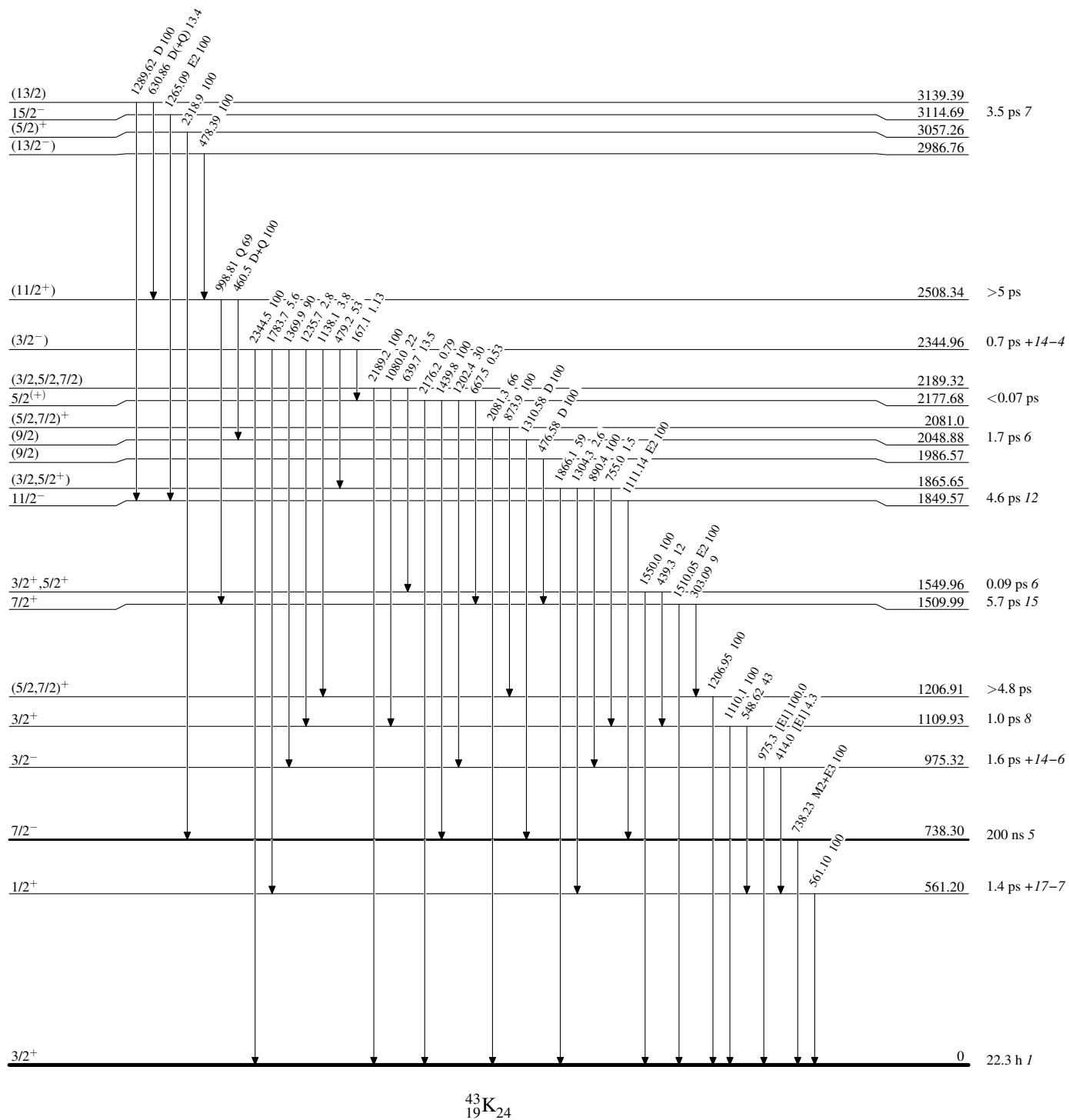
Level Scheme

Intensities: Relative photon branching from each level

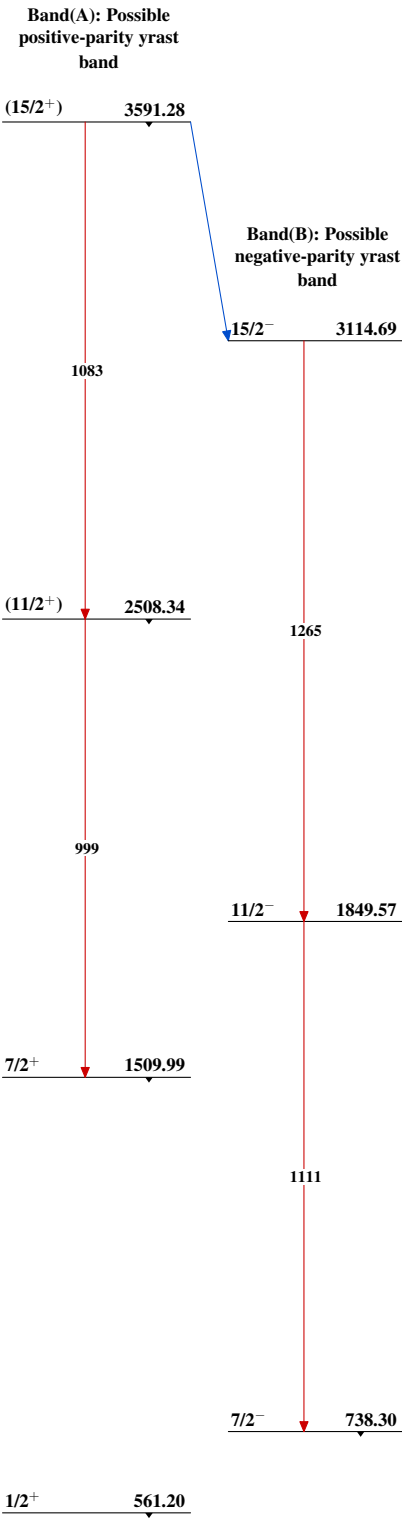
-----► γ Decay (Uncertain) $^{43}_{19}\text{K}_{24}$

Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas



$^{43}_{19}\text{K}_{24}$