^{173}Yb(p,nγ), (d,2nγ) 1973Ke10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

Target $J^\pi=5/2^-$; E(p)=6.7 MeV, ED=13.5 MeV; enriched metallic Yb targets (89.7%); measured Eγ, Iγ (Ge(Li) with FWHM=0.6 keV at 122 keV, Ge(Li) (large volume)), γγ coin, γ(θ) at 90°, 105°, 120°, 135°, 150°, 160°. Reference citations are given with data from other sources.

^{173}Lu Levels

Band structure: see Adopted Levels.

E(level)	J^π[†]	$T_{1/2}$[‡]	Comments
0.0	$7/2^+$		
117.1 *1*	$9/2^+$		
123.6 *1*	$5/2^-$	74.2 μs *10*	$T_{1/2}$: adopted value; delayed coincidence measurements in ^{173}Yb(p,nγ), (d,2nγ) include 70 μs *10* (1965Bj01) and 87 μs *3* (1967Co20,1967Co26). Others: 1965Mc03, 1968Io01.
128.3 *1*	$1/2^-$	5.2 ns *5*	
198.4 *2*	$9/2^-$		
258.5 *1*	$11/2^+$		
263.1 *2*	$3/2^-$	≤0.16 ns	
357.0 *1*	$5/2^+$	383 ps *19*	$T_{1/2}$: Ce(t) (1978Gu18). Other measurement: 400 ps *80* (γ(t), 1976Sc19). Other: 1973Sc20.
358.6 *2*	$13/2^-$		
423.6 *2*	$13/2^+$		
425.2 *2*	$1/2^+$	0.84 ns *20*	
428.0 *2*	$7/2^-$		
434.9 *2*	$3/2^+$	0.38 ns *10*	
449.0 *1*	$9/2^-$	0.58 ns *12*	$T_{1/2}$: γγ(t) (1976Sc19). Other: 1973Sc20.
451.1 *2*	$7/2^+$		
552.1 *2*	$5/2^+$		
570.8 *2*	$9/2^+$		
576.3 *2*	$7/2^+$		
580.1 *2*	$11/2^-$		
606.6 *2*	$17/2^-$		
611.4 *2*	$15/2^+$		
654.3 *2*	$11/2^-$		
715.3 *2*	$11/2^+$		
734.6 *2*	$13/2^-$		
777.8 *2*	$9/2^+$		
820.0 *2*	$11/2^+$		
821.0 *2*	$17/2^+$		
883.5 *3*	$13/2^+$		
912.0 *2*	$15/2^-$		
941.7 *3*	$21/2^-$		
948.8 *2*	$15/2^-$		
1051.5 *2*	$19/2^+$		
1074.7 *3*	$15/2^+$		
1092.4 *3*	$13/2^+$		
1111.9 *2*	$17/2^-$		
1154.5 *3*	$15/2^+$		
1287.3 *3*	$17/2^+$		
1302.1 *3*	$21/2^+$		
1316.3 *3*	$19/2^-$		
1332.9 *3*	$19/2^-$		
1361.2 *4*	$25/2^-$		
1475.0? *3*	$(17/2^+)$		

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^{173}Yb(p,nγ), (d,2nγ) 1973Ke10 (continued)

^{173}Lu Levels (continued)

E(level)	Jπ†
1520.9 *3*	19/2+
1573.9? *3*	(23/2+)
1574.7 *3*	21/2−
1836.9? *4*	(23/2−)

† From Iγ(d,2nγ)/Iγ(p,nγ) ratios and fits of γ-ray cascades into a set of interconnected rotational bands analogous to those in ^{171}Lu (authors' values). See ^{173}Lu Adopted Levels for evaluator's assignments.

‡ Adopted values except where noted.

γ(^{173}Lu)

Multipolarities implied by level-scheme conclusions of authors are not explicitly reported.

Eγ†	Iγ‡	Ei(level)	Jiπ	Ef	Jfπ	Iγ#	Comments
(4.670 *15*)		128.3	1/2−	123.6	5/2−		Eγ: from ^{173}Hf ε decay.
74.8 *1*	29	198.4	9/2−	123.6	5/2−	32	
94.1 *1*	14	451.1	7/2+	357.0	5/2+	18	
117.1[b] *1*	100[b]	117.1	9/2+	0.0	7/2+	100[@]	
117.1[b] *1*	100[b]	552.1	5/2+	434.9	3/2+	100[@]	
119.7 *1*	16	570.8	9/2+	451.1	7/2+	20	
123.6 *1*	440	123.6	5/2−	0.0	7/2+	750	
126.9 *3*	0.5	552.1	5/2+	425.2	1/2+		
131.1 *1*	40	580.1	11/2−	449.0	9/2−	21	
134.9 *2*	5.2	263.1	3/2−	128.3	1/2−	15	
139.6 *2*	14	263.1	3/2−	123.6	5/2−	41	
141.4[b] *2*	60[b]	258.5	11/2+	117.1	9/2+	44[@]	
141.4[b] *2*	60[b]	576.3	7/2+	434.9	3/2+	44[@]	
144.5 *1*	16	715.3	11/2+	570.8	9/2+	10	
154.6 *1*	31	734.6	13/2−	580.1	11/2−	14	
160.2 *1*	88	358.6	13/2−	198.4	9/2−	38	
162.1 *2*	2.7	425.2	1/2+	263.1	3/2−	11	
165.0 *1*	29	423.6	13/2+	258.5	11/2+	12	
168.2 *2*	8.6	883.5	13/2+	715.3	11/2+		
177.4 *1*	19	912.0	15/2−	734.6	13/2−	3.8	
187.7 *1*	13	611.4	15/2+	423.6	13/2+	2.6	
190.3 *3*	8.1	449.0	9/2−	258.5	11/2+	5.9	
191.1 *3*	5.0	1074.7	15/2+	883.5	13/2+		
199.8 *1*	10.3	1111.9	17/2−	912.0	15/2−		
201.6 *2*	7.9	777.8	9/2+	576.3	7/2+	12	
209.5 *2*	5.5	821.0	17/2+	611.4	15/2+		
212.5 *3*	2.9	1287.3	17/2+	1074.7	15/2+		
213.7 *3*	2.4	570.8	9/2+	357.0	5/2+		
220.9 *2*	3.1	1332.9	19/2−	1111.9	17/2−		
225.6 *3*	3.4	777.8	9/2+	552.1	5/2+	6.9	
226.2 *3*	6.8	654.3	11/2−	428.0	7/2−	11	
229.6 *1*	18	428.0	7/2−	198.4	9/2−	42	
230.5 *3*	1.6	1051.5	19/2+	821.0	17/2+		
≈233[&]	2	1520.9	19/2+	1287.3	17/2+		
241.7 *3*	1.8	1574.7	21/2−	1332.9	19/2−		

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^{173}Yb(p,nγ), (d,2nγ) 1973Ke10 (continued)

γ(^{173}Lu) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Iγ [#]
243.7 *3*	8.5	820.0	$11/2^+$	576.3	$7/2^+$	11
248.0 *1*	49	606.6	$17/2^-$	358.6	$13/2^-$	8.8
250.6 *3*	0.7	1302.1	$21/2^+$	1051.5	$19/2^+$	
258.5 *1*	40	258.5	$11/2^+$	0.0	$7/2^+$	24
262.2 *3*	0.9	1836.9?	$(23/2^-)$	1574.7	$21/2^-$	
264.2 *2*	4.4	715.3	$11/2^+$	451.1	$7/2^+$	
≈272 [&d]	≈4	1092.4	$13/2^+$	820.0	$11/2^+$	
285.7 *2*	8.0	734.6	$13/2^-$	449.0	$9/2^-$	
289.0 *2*	5.2	552.1	$5/2^+$	263.1	$3/2^-$	6.2
294.7 *3*	4.5	948.8	$15/2^-$	654.3	$11/2^-$	
295.6 *2*	13	654.3	$11/2^-$	358.6	$13/2^-$	11
297.0 *2*	14	425.2	$1/2^+$	128.3	$1/2^-$	40
304.4 *1*	18	428.0	$7/2^-$	123.6	$5/2^-$	30
306.6 [c] *3*	43 [c]	423.6	$13/2^+$	117.1	$9/2^+$	15
306.6 [c] *3*	14 [c]	434.9	$3/2^+$	128.3	$1/2^-$	31
311.2 *2*	25	434.9	$3/2^+$	123.6	$5/2^-$	56
312.8 *3*	5.3	883.5	$13/2^+$	570.8	$9/2^+$	
314.4 *3*	6.0	1092.4	$13/2^+$	777.8	$9/2^+$	
320.6 *2*	4.5	1475.0?	$(17/2^+)$	1154.5	$15/2^+$	
331.9 [c] *3*	42 [c]	449.0	$9/2^-$	117.1	$9/2^+$	32
331.9 [c] *3*	8 [c]	912.0	$15/2^-$	580.1	$11/2^-$	
334.2 *3*	4.0	1154.5	$15/2^+$	820.0	$11/2^+$	
335.0 *2*	16	941.7	$21/2^-$	606.6	$17/2^-$	
342.2 *2*	4.8	948.8	$15/2^-$	606.6	$17/2^-$	
349.8 *2*	3.8	777.8	$9/2^+$	428.0	$7/2^-$	
352.9 *1*	35	611.4	$15/2^+$	258.5	$11/2^+$	4.3
357.0 *1*	94	357.0	$5/2^+$	0.0	$7/2^+$	180
359.4 *2*	3.0	1074.7	$15/2^+$	715.3	$11/2^+$	
367.8 *2*	3.0	1316.3	$19/2^-$	948.8	$15/2^-$	
374.5 *2*	≈2	1316.3	$19/2^-$	941.7	$21/2^-$	
377.4 *3*	6.1	1111.9	$17/2^-$	734.6	$13/2^-$	
377.9 *3*	9.7	576.3	$7/2^+$	198.4	$9/2^-$	20
382.8 *2*	3.0	1475.0?	$(17/2^+)$	1092.4	$13/2^+$	
[x]388.0 *2*	4.9					
[x]395.6 *3*	5.2					
397.4 *2*	22	821.0	$17/2^+$	423.6	$13/2^+$	
403.8 *2*	2.6	1287.3	$17/2^+$	883.5	$13/2^+$	
419.5 *3*	2.2	1361.2	$25/2^-$	941.7	$21/2^-$	
420.9 *3*	2.6	1332.9	$19/2^-$	912.0	$15/2^-$	
438.2 *2*	1.8	1092.4	$13/2^+$	654.3	$11/2^-$	
440.1 *1*	11.4	1051.5	$19/2^+$	611.4	$15/2^+$	
446.2 *2*	4.1	1520.9	$19/2^+$	1074.7	$15/2^+$	
449.0 *1*	89	449.0	$9/2^-$	0.0	$7/2^+$	63
451.2 *3*	8.8	451.1	$7/2^+$	0.0	$7/2^+$	15
452.7 *2*	19	576.3	$7/2^+$	123.6	$5/2^-$	33
456.0 *1*	19	654.3	$11/2^-$	198.4	$9/2^-$	12
461.7 *3*	8	820.0	$11/2^+$	358.6	$13/2^-$	
463.0 [c] *3*	8 [c]	580.1	$11/2^-$	117.1	$9/2^+$	
463.0 [c] *3*	8 [c]	1574.7	$21/2^-$	1111.9	$17/2^-$	
476.0 *2*	1.8	734.6	$13/2^-$	258.5	$11/2^+$	
481.1 *2*	9.5	1302.1	$21/2^+$	821.0	$17/2^+$	
522.4 *2*	3.1	1573.9?	$(23/2^+)$	1051.5	$19/2^+$	
590.2 *1*	14	948.8	$15/2^-$	358.6	$13/2^-$	
621.6 *1*	10 [a]	820.0	$11/2^+$	198.4	$9/2^-$	

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^{173}Yb(p,nγ), (d,2nγ) 1973Ke10 (continued)

γ(^{173}Lu) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π
709.5 *2*	2.7[a]	1316.3	19/2$^-$	606.6	17/2$^-$
795.9 *2*	8.5[a]	1154.5	15/2$^+$	358.6	13/2$^-$

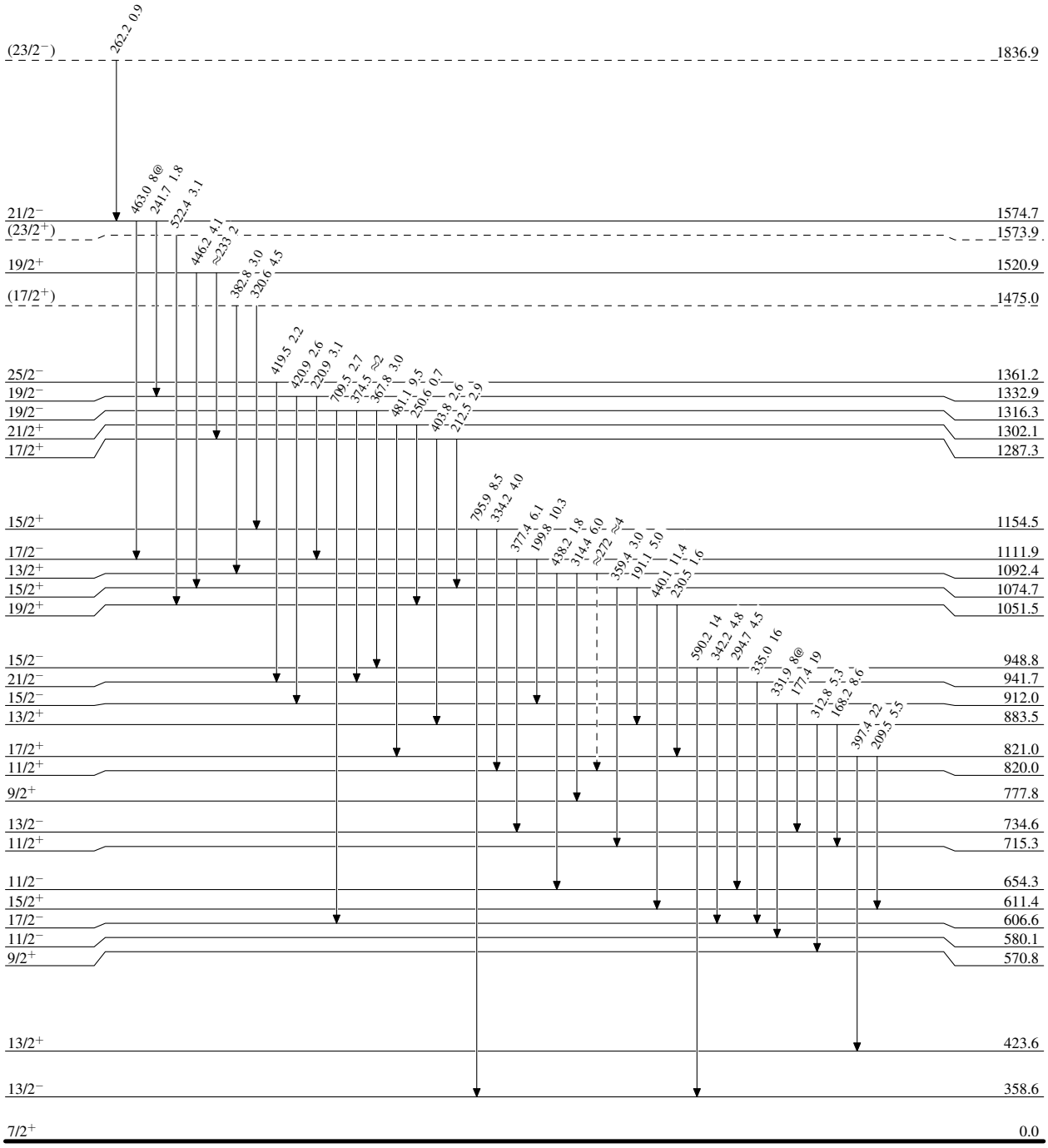
† ΔE estimated by evaluator from authors′ statement that energy uncertainties are 0.1 to 0.3 keV, depending on Iγ and the complexity of the spectrum.
‡ Arbitrary units relative to Iγ=100 for 117.1γ for ^{173}Yb(d,2nγ), θ=125°; uncertainties range from 10 to 30%.
# Arbitrary units relative to Iγ=100 for 117.1γ for ^{173}Yb(p,nγ), θ=125°; uncertainties range from 10 to 30%.
@ Multiply placed; undivided intensity given.
& From coincidence data; line is obscured by background in singles spectra.
a Measured at θ=90°.
b Multiply placed with undivided intensity.
c Multiply placed with intensity suitably divided.
d Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

^{173}Yb(p,nγ), (d,2nγ) 1973Ke10

Level Scheme

Intensities: Relative Iγ for ^{173}Yb(d,2nγ), θ=125°
@ Multiply placed: intensity suitably divided

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



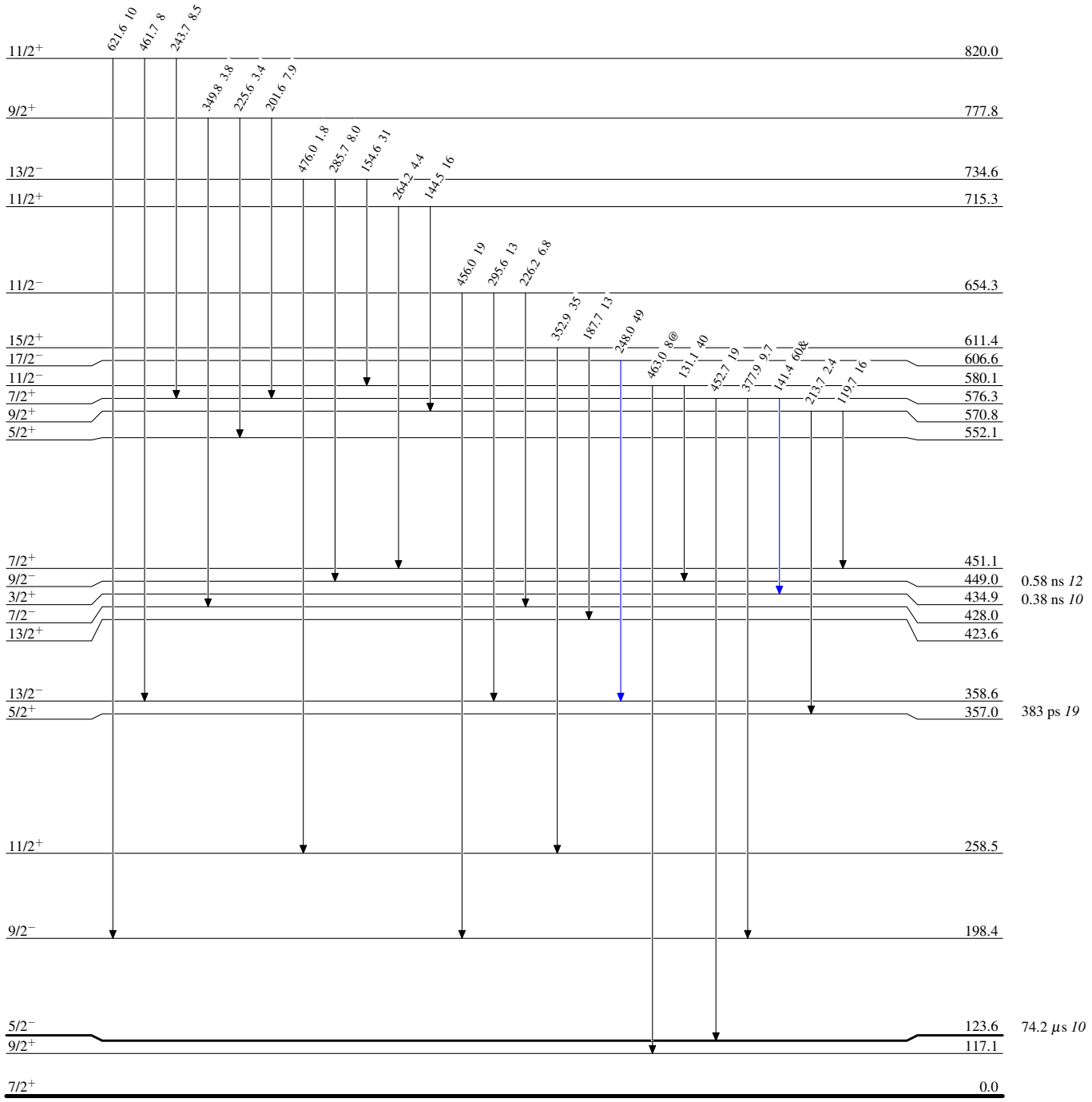
$^{173}_{71}Lu_{102}$

^{173}Yb(p,nγ), (d,2nγ) 1973Ke10

Level Scheme (continued)

Intensities: Relative Iγ for ^{173}Yb(d,2nγ), θ=125°
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



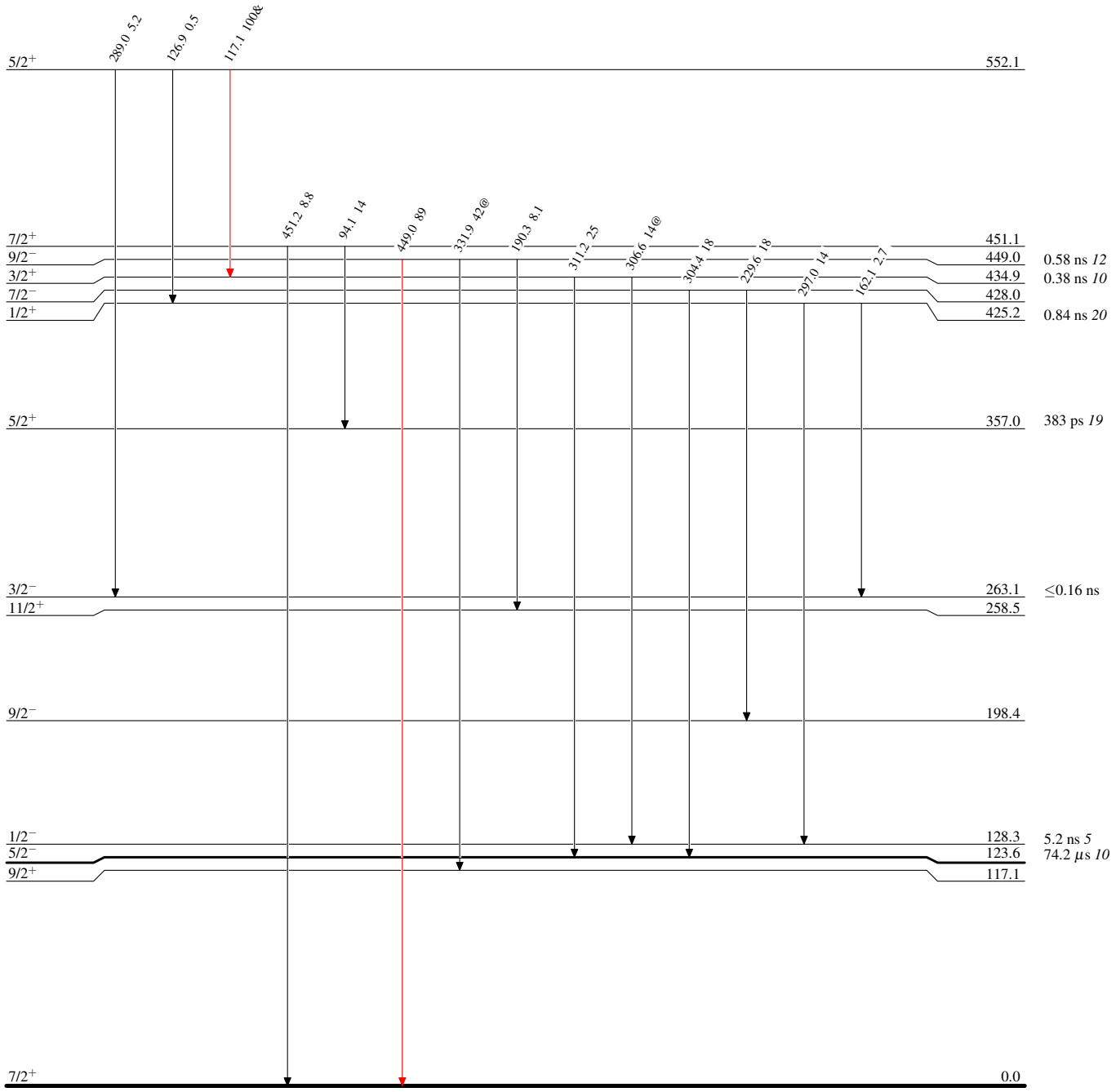
$^{173}_{71}Lu_{102}$

^{173}Yb(p,nγ), (d,2nγ) 1973Ke10

Level Scheme (continued)

Intensities: Relative Iγ for ^{173}Yb(d,2nγ), θ=125°
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



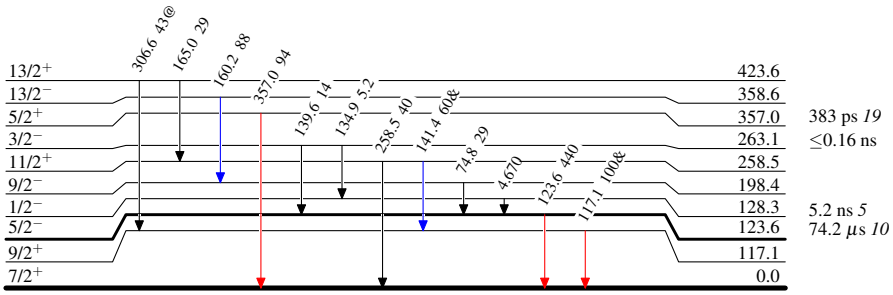
$^{173}_{71}Lu_{102}$

^{173}Yb(p,nγ), (d,2nγ) 1973Ke10

Level Scheme (continued)

Intensities: Relative Iγ for ^{173}Yb(d,2nγ), θ=125°
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{173}_{71}Lu_{102}$