^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

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Also includes ^{4}He(^{35}Cl,pγ).

^{35}Cl(α,pγ) reaction:

1976Gl10: E=14 MeV alpha beam was produced from the 7-MV Van de Graaff accelerator of the University of Freiburg. Target was 280 μg/cm^2 AgCl (99% in ^{35}Cl) evaporated onto a 10 μg/cm^2 carbon backing. Charged-particles were detected with an ΔE-E telescope of two annular surface barrier detectors and γ-rays were detected with three Ge(Li) detectors. Measured Eγ, Iγ, pγ-coin, p$\gamma(\theta)$. Deduce levels, J, π, γ-ray branching ratios, multipolarities, mixing ratios. Comparisons with available data.

1980Ke01: E=16 MeV alpha beam was produced from the 7-MV Van de Graaff accelerator of the University of Freiburg. Target was 140 μg/cm^2 AgCl (98% in ^{35}Cl) evaporated onto a 10 μg/cm^2 carbon backing. Charged particles were detected with an ΔE-E telescope of two annular surface barrier detectors and γ-rays were detected with two Ge(Li) detectors. Measured Eγ, Iγ, pγ-coin. Deduced levels, γ-ray branchings. Comparisons with shell-model calculations. See also following measurements at the same laboratory as 1980Ke01 and 1976Gl10: 1974Be68, 1967Ro16, 1968Li04.

1971Ja10: E=8.0 MeV alpha beam was produced from the Oliver Lodge Laboratory of the University of Liverpool. Target was 1.4 mg/cm^2 AgCl (99.3% enriched in ^{35}Cl) on a gold backing. γ-rays were detected with an escape-suppressed and pair-escape Ge(Li) spectrometer. Measured Eγ, Iγ, $\gamma(\theta)$, Doppler shift attenuation (DSA). Deduced levels, J, $T_{1/2}$, γ-ray branching ratios, transition strengths. Comparisons with available data and shell-model calculations. See also 1971Ja15. 25% uncertainty in stopping power assumed.

1979Aa01: E=18 MeV alpha beam was produced from the Utrecht E(n) tandem accelerator. Target was 200 μg/cm^2 $BaCl_2$ (99% enriched in ^{35}Cl) on a 10 μg/cm^2 carbon backing. Protons were detected with an annular Si counter and γ-ray were detected with a Ge(Li) detector. Measured pγ-coin. Deduced levels. Data in 1979Aa01 are mainly for ^{24}Mg(^{16}O,2pγ)^{38}Ar.

^{4}He(^{35}Cl,pγ) reaction:

1976Fo12 (also 1974Fo13): E=55 MeV ^{35}Cl beam provided by the Chalk River MP tandem. Measured lifetime by DSAM for the 2168 level.

1972Ke03: E=60, 64 MeV beams provided by the Stanford University tandem. Measured lifetimes by RDM for 3377 and 4585 levels.

1970En04: E=96 MeV ^{35}Cl beam was provided by the second tandem of the BNL three-stage MP tandem. Measured lifetimes by RDM for the 4585 level.

Others: (α,pγ) reaction:

1984Bh03: E=6.3-7.3 MeV alpha beams were produced from the folded tandem accelerator at University of Auckland. Measured Eγ, Iγ, pγ-coin, p$\alpha\gamma$-coin. Deduced lifetimes using recoil-distance method (RDM) for the 3377 level.

1975So11: ^{35}Cl(α,pe$^+$e$^-$) E=7.67 MeV alpha beam provided by 5.5-MV Van de Graaff of the Centre de Recherches Nucleaires. Measured E(p), I(p), $\gamma\gamma$-coin pair spectrum for E0 transition from 3378 level.

1974Be68: E=14, 14.5 MeV. Measured E(p), Eγ, p$\gamma(\theta)$, lifetimes by DSAM.

1973Gr19: E=8.5 MeV beam provided by the Oxford Nuclear Physics Laboratory. Measured lifetime of the 4585 level by RDM.

1972Ba15: E=11.5 MeV beam provided by the Chalk River MP tandem accelerator. Measured lifetimes by RDM for 3377 and 4585 levels and by DSAM for the 4480 level.

1972Li15: E=10.5 MeV. Measured lifetimes by RDM and by DSAM for the 4585 level.

1971Ja15: E=6.25, 7.0, 8.0 MeV. Measured lifetime of 2167 level by DSAM. Main experiment is for ^{40}Ar levels, ^{35}Cl present as an impurity.

1970Cu02: E=8.10 MeV beam provided by the Harwell 5-MV Van de Graff at the Atomic Energy Research Establishment, England. Measured Eγ, Iγ, pγ-coin, lifetimes by DSAM for the 2170 and 3380 levels. 15% uncertainty in stopping power assumed.

1969En04: E=7.61 MeV provided by the Utrecht 2×6-MV tandem, measured lifetimes by DSAM for six levels. Uncertainty in stopping power included.

1969Gr03: E=4.5-6.1 MeV beams provided by the Freiburg Van de Graff. Measured lifetimes by DSAM for the 2163 level. Uncertainty due to slowing down process included.

1969Ka18: E≈threshold, measured lifetimes by DSAM. No result is given.

1968Li04: E=5.9, 10.5 MeV beams provided by the Freiburg Van de Graff. Measured lifetimes by DSAM and pγ(t).

1967Ro16: E=5.9, 10.6 MeV beams by the Freiburg Van de Graff. Measured Eγ, Iγ, pγ-coin, $\gamma(\theta)$. Deduced levels, J, branching ratios, mixing ratios.

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

^{38}Ar Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0	0$^+$		
2167.6 *5*	2$^+$	0.45 ps *2*	E(level): others: 2163 *3* (1969Gr03), 2163 *2* (1968Li04). T$_{1/2}$: weighted average of 0.47 ps *2* (1976Fo12), 0.53 ps *17* (1971Ja15) (supersede 0.65 ps *19* not corrected for delayed feedings in 1971Ja10), 0.33 ps $^{11-8}$ (1970Cu02), 0.31 ps *8* (1969Gr03), 0.45 ps *6* (1968Li04), 0.37 ps *5* (1969En04).
3378.5 *20*	0$^+$	22.8 ps *15*	T$_{1/2}$: weighted average of 23.9 ps *11* (1984Bh03), 24 ps *4* (1972Ba15), and 19 ps *2* (1972Ke03). Others: >2 ps (1971Ja10), 25 ps *+8−12* (1970Cu02), 7 ps *4* (1969En04),
3810.3 *5*	3$^-$	52 fs *14*	E(level): other: 3808 *3* (1968Li04). T$_{1/2}$: weighted average of 76 fs *42* (1971Ja10), 52 fs *21* (1969En04), 49 fs *14* (1968Li04).
3937.1 *5*	2$^+$	32 fs *13*	T$_{1/2}$: from 1969En04. Other: <28 fs (1971Ja10).
4480.1 *5*	4$^-$	1.3 ps *+8−3*	E(level): other: 4477 *3* (1968Li04). T$_{1/2}$: weighted average of 1.1 ps *+8−3* (1972Ba15) and 1.9 ps *+14−7* (1971Ja10). Others: ≤1.04 ps *23* (1969En04), >0.7 ps (1968Li04).
4565.2 *5*	2$^+$	51[#] fs *14*	T$_{1/2}$: other: 17 ps *17* (1969En04).
4585 *2*	5$^-$	128 ps *6*	T$_{1/2}$: weighted average of 131 ps *25* (1973Gr19), 136 ps *7* (1972Ba15), 157 ps *15* (1972Li15,RDM), 162 ps *28* (1972Li15,DSAM), 126 ps *9* (1970En04) and 119 ps *6* (1972Ke03). Other: ≤243 ps (1968Li04,delayed-coincidence).
4712 *2*	0$^+$	1.7[#] ps *+21−7*	
4875.9 *5*	3$^-$	53[#] fs *14*	E(level): other: 4890 *3* (1968Li04). J$^\pi$: J=(2,3) from p$\gamma(\theta)$ in 1967Ro16. T$_{1/2}$: other: 0.10 ps *6* (1968Li04).
5084.6 *10*	(2)$^-$	57[#] fs *21*	
5155.8 *10*	2$^+$	28[#] fs *13*	
5349.6 *10*	4$^+$	0.14[#] ps *4*	J$^\pi$: J=4 from p$\gamma(\theta)$ in 1974Be68. 1967Ro16 give J=(1,2) based on p$\gamma(\theta)$ correlations of 1413γ, 3182γ and 3937γ, but 1974Be68 state that the first two correlations in 1967Ro16 were actually in excellent agreement of J(5350)=4 while the last one did not agree. 1974Be68 also mention that the last correlation was remeasured by G. Schmid at the same laboratory (Freiburg) in 1973 and agreement with J=4 was established but with J=2,3 not excluded. 1971Ja10 also claim that the assignment of J=(1,2) by 1967Ro16 was probably incorrect.
5512.3 *10*	3$^-$	0.19[#] ps *6*	
5552 *2*	1$^+$,2$^+$	<31[#] fs	
5657.0 *10*	5$^-$	64[#] fs *28*	
6042	(3$^-$,4$^+$)		
6053			
6250	2$^+$		
6408	6$^+$		E(level): also reported in 1980Ke01.
6601			
6674	5$^-$		
6846 *2*			
6852 *1*	(1,2$^+$)		
6870 *2*	(2$^-$,3,4$^+$)		
6904 *2*	2$^-$,3$^-$		
6949 *2*	(2$^+$)		
7047 *2*	(3$^-$,4$^+$)		
7070 *2*	5$^-$	51[@] fs *14*	J$^\pi$: from 2485γ ΔJ=0 M1+E2 γ to 5$^-$ based on p$\gamma(\theta)$ in 1976Gl10. However, (6)$^-$ is assigned in Adopted Levels based on $\gamma(\theta)$(DCO) value in ^{28}Si(α,2pγ) and a 437.8γ from 7$^-$ which favors ΔJ<2. In the opinion of the evaluator, the spin of this level needs reinvestigation. Also see comments for this level in ^{28}Si(α,2pγ) and Adopted Levels.
7101 *2*	(1$^-$ to 4$^+$)		

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^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

^{38}Ar Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	Comments
7128 *1*	(1^- to 4^+)		
7181 *2*	($1,2^+$)		
7194 *2*	(2^-,3,4)		
7234 *2*	(2^+)		
7235 *2*	(1^- to 4^+)		
7288 *1*	6^+	53 fs *20*	Jπ: J=(6,4) from pγ(θ) in 1974Be68. $T_{1/2}$: from 1974Be68 using DSAM.
7291 *2*	(3^-,4^+)		
7335 *1*	(1^- to 4^+)		
7350 *1*	(3^-,4^+)		
7370 *2*	(1^+)		
7376 *1*	(2^+,3,4^+)		
7431 *2*	(2^-,3,4^+)		
7452 *2*	(1^- to 4^+)		
7485 *3*	(3^-,4^+)		
7497 *1*	(3,4,5^-)		
7507 *1*	7^-	≥42 fs	Jπ: from stretched E2 2922γ to 5^-, based on pγ(θ) and RUL (1976Gl10). $T_{1/2}$: from 1976Gl10.
7528 *2*	(3^- to 7^-)		
7539 *2*	(3,4,5)		
7663 *2*	(2^+ to 6^+)		
7667 *1*	(3^- to 7^-)		
7684 *2*	(3^-,4^+)		
7702 *1*	(1^+)		
7786 *1*	(2^- to 6^-)		
7828 *2*	(1^- to 5^-)		
7857 *2*	(1^-,2^+)		
7859 *2*	(6)		
7894 *2*	(1^+,2^+)		
7899 *2*			
7911 *1*	(3^-,4^+)		
7992 *2*	(1^-,2,3^-)		
8068 *1*	(3^-,4^+)		
8077 *2*	7^+	0.11@ ps *3*	Jπ: J=(7,5) from pγ(θ) of 1669γ in 1976Gl10. Additional information 1.
8106 *2*	(0^+ to 4^+)		
8124 *1*	(3^- to 6^+)		
8129 *2*	(6^-)		Jπ: J=(6,5) from pγ(θ) of 1059γ in 1976Gl10. Additional information 2.
8181 *2*	(3^-,4^+)		
8215 *2*	(3^- to 7^-)		
8233 *2*	(1^-)		
8261 *2*	(3^- to 6^-)		
8311 *2*	(1^+)		
8353 *3*	($1,2^+$)		
8391 *2*	(2^+)		
8417 *2*	(3^- to 7^-)		
8481 *2*	(3^- to 6^-)		
8488 *2*	(5,7)		Jπ: from ΔJ=0 or 2 1418γ to J^π(7070)=5^-, based on pγ(θ) in 1976Gl10. However, J^π(8488)=(6^-) and J^π(7070)=$(6)^-$ is assigned in Adopted Levels based on γγ(θ)(DCO) value in ^{28}Si(α,2pγ). See detailed comment there.
8517 *2*	($1,2^+$)		
8520 *3*	(3^- to 6^-)		
8568 *2*	8^+		
8595 *2*	(3^- to 7^-)		

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^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

^{38}Ar Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	Comments
8650 *2*	(3^- to 6^+)		
8668 *4*	2^+		
8783 *2*	(3^- to 7^-)		
8789 *3*	(4^- to 7^-)		
8800 *2*			
8809 *2*	(4^+ to 8^+)		
8828 *2*	(3^- to 7^-)		
8875 *4*	(3^- to 6^-)		
8944 *2*	(4^+ to 7^-)		
8956 *2*	(4^- to 7^-)		
8972 *1*	7^-	≤28 fs	$T_{1/2}$: from 1976Gl10.
8998 *2*	(4^+,5,6^-)		
9072 *2*	(4^-,5,6^+)		
9077 *2*	(1^- to 5^-)		
9087 *3*	(3^- to 7^-)		
9100 *2*	(1,2^+)		
9158 *2*	(0^+ to 4^+)		
9170 *2*	(3^- to 6^-)		
9199 *3*			
9204 *4*	(0^+ to 4^+)		
9260 *4*	(0^+ to 4^+)		
9293 *2*	(3^- to 7^-)		
9300 *4*	(0^+ to 4^+)		
9330 *2*	(4^+ to 8^+)		
9338 *3*	8^+	73 fs *17*	Jπ: J=(8,6,4) from p$\gamma(\theta)$ in 1974Be68. $T_{1/2}$: from 1974Be68 using DSAM.
9349 *3*	(7^-)		
9374 *2*	(3^- to 7^-)		
9437 *2*	(3^- to 7^-)		
9460 *2*	(3^- to 7^-)		
9535 *3*	$8^{(+)}$		
9644 *2*	(5^- to 9^-)		
9647 *2*	(2^- to 6^-)		
9655 *2*	(3^- to 7^-)		
9669 *2*	(3^- to 7^-)		
9829 *2*			
9928 *2*	(9^+)		
10024 *2*	(8^-)		E(level): 1980Ke01 place 2954γ from a level at 10024 and 1900γ from a level at 10029. In Adopted Levels, the two levels in 1980Ke01 are considered as the same level, based on results in (^{28}Si,α2pγ) (2002Ru01).
10101 *2*	(3^- to 7^-)		
10112 *2*	(4^+ to 8^+)		
10120 *2*			
10135 *2*			
10174 *2*	9^-		
10181 *2*			
10245 *2*			
10274 *2*	(4^+ to 8^+)		
10316 *2*	(3^- to 7^-)		
10443 *2*	(4^+ to 8^+)		
10455 *2*	(5^- to 8^+)		
10557 *2*			
10589 *2*	(4^+ to 7^-)		
10634 *2*	(6^+ to 10^+)		
10676 *2*	(4^+ to 8^+)		
10890 *2*			

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^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

^{38}Ar Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
10947 *2*	(9^-)	11174 *2*		11434 *2*	$(2^+,3^-)$	11595 *2*	
11068 *2*		11199 *2*		11452 *2*		11608 *2*	
11078 *2*		11290 *2*		11484 *2*	$(7^-$ to $11^-)$	11614 *2*	11^-
11087 *2*	$(4^+$ to $8^+)$	11297 *2*		11495 *2*		11620 *2*	
11109 *2*		11379 *2*	$(4^+$ to $8^+)$	11543 *2*		11630 *2*	
11163 *2*		11428 *2*	$(4^+$ to $8^+)$	11547 *2*	$(7^-$ to $11^-)$		

† From 1971Ja10 up to 5657 level, from 1976Gl10 above 5657 up to 9928 level, and from 1980Ke01 above 9928 level, unless otherwise noted.
‡ From Adopted Levels, unless otherwise noted. Assignments from measurements in this dataset are given in comments.
# From 1971Ja10, a 25% uncertainty in the slowing down process included.
@ Quoted in 1976Gl10 as from 1974Be68 but not published in the latter.

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

$\gamma(^{38}Ar)$

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	$I_{(\gamma+ce)}$	Comments
2167.6	2^+	2168	100	0	0^+			
3378.5	0^+	1211	100	2167.6	2^+			
		3378		0	0^+	E0	0.66 *10*	E_γ,$I_{(\gamma+ce)}$: E0 decay by e^+e^- pair (1975So11).
3810.3	3^-	1643	100	2167.6	2^+			
3937.1	2^+	1769	11 *6*	2167.6	2^+			I_γ: from 1967Ro16.
		3937	100 *6*	0	0^+			I_γ: from 1967Ro16.
4480.1	4^-	543[&]		3937.1	2^+			
		670	100	3810.3	3^-			
4565.2	2^+	2398	100	2167.6	2^+			
4585	5^-	105		4480.1	4^-			
		775		3810.3	3^-			
4712	0^+	775	100	3937.1	2^+			
4875.9	3^-	1066	100 *11*	3810.3	3^-	D(+Q)		Mult.,δ: from p$\gamma(\theta)$ in 1967Ro16, with δ=+0.16 *+10−16* or 0.0 *+3−1* for J=3. I_γ: weighted average of 100 *16* (1971Ja10) and 100 *11* (1967Ro16).
		2708	74 *12*	2167.6	2^+	D+Q		Mult.,δ: from p$\gamma(\theta)$ in 1967Ro16, with δ=−0.30 *+7−14* or −2.7 *3* for J=3. I_γ: weighted average of 56 *16* (1971Ja10) and 82 *11* (1967Ro16).
5084.6	$(2)^-$	2917	100	2167.6	2^+			
5155.8	2^+	1345	39 *7*	3810.3	3^-			
		2988	100 *7*	2167.6	2^+			
5349.6	4^+	1412	54 *9*	3937.1	2^+			I_γ: weighted average of 61 *8* (1971Ja10) and 43 *10* (1967Ro16). Additional information 3.
		3182	100 *8*	2167.6	2^+			I_γ: weighted average of 100 *8* (1971Ja10) and 100 *10* (1967Ro16). Additional information 4.
5512.3	3^-	636	<10	4875.9	3^-			
		1032	100	4480.1	4^-			
		3345	<15	2167.6	2^+			
5552	$1^+,2^+$	1615	100	3937.1	2^+			
5657.0	5^-	1072	100	4585	5^-			
		1177	6	4480.1	4^-			I_γ: from 1979Aa01.
6408	6^+	1823		4585	5^-			
6846		1761	100	5084.6	$(2)^-$			
6852	$(1,2^+)$	2287	33 *10*	4565.2	2^+			
		3473	100 *13*	3378.5	0^+			
		6851	33 *10*	0	0^+			
6870	$(2^-,3,4^+)$	1994		4875.9	3^-			
		3060		3810.3	3^-			
		4702		2167.6	2^+			
6904	$2^-,3^-$	4736	100	2167.6	2^+			
6949	(2^+)	3570	100 *13*	3378.5	0^+			
		4781	59 *10*	2167.6	2^+			
7047	$(3^-,4^+)$	2567	56 *15*	4480.1	4^-			
		3237	100 *9*	3810.3	3^-			

$^{38}_{18}Ar_{20}$-6

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

$\gamma(^{38}Ar)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	δ[@]	Comments
7047	(3$^-$,4$^+$)	4879	19 *4*	2167.6	2$^+$			
7070	5$^-$	2485	100	4585	5$^-$	M1+E2	+0.53 *+3−9*	Mult.,δ: D+Q from p$\gamma(\theta)$ in 1976Gl10; M2 is ruled out by RUL based on $T_{1/2}$. A_2=+0.58 *5*, A_4=−0.15 *6* (1976Gl10).
7101	(1$^-$ to 4$^+$)	4933	100	2167.6	2$^+$			
7128	(1$^-$ to 4$^+$)	3318	100 *10*	3810.3	3$^-$			
		4960	41 *8*	2167.6	2$^+$			
7181	(1,2$^+$)	7180	100	0	0$^+$			
7194	(2$^-$,3,4)	2318	27 *11*	4875.9	3$^-$			
		2714	100 *13*	4480.1	4$^-$			
		3384	34 *11*	3810.3	3$^-$			
7234	(2$^+$)	7233	100	0	0$^+$			
7235	(1$^-$ to 4$^+$)	5067	100	2167.6	2$^+$			
7288	6$^+$	880	7 *1*	6408	6$^+$			
		1938	100 *4*	5349.6	4$^+$			δ(Q/D)=+0.97 *23* for J=4 (1974Be68). A_2=+0.47 *5*, A_4=−0.22 *6* (1974Be68).
		2703	27 *4*	4585	5$^-$			
7291	(3$^-$,4$^+$)	3481	100	3810.3	3$^-$			
7335	(1$^-$ to 4$^+$)	3525	100 *17*	3810.3	3$^-$			
		5167	67 *17*	2167.6	2$^+$			
7350	(3$^-$,4$^+$)	1100	46 *10*	6250	2$^+$			
		2765	98 *10*	4585	5$^-$			
		2870	100 *10*	4480.1	4$^-$			
7370	(1$^+$)	7369	100	0	0$^+$			
7376	(2$^+$,3,4$^+$)	1126	45 *10*	6250	2$^+$			
		2026	100 *2*	5349.6	4$^+$			
7431	(2$^-$,3,4$^+$)	5263	100	2167.6	2$^+$			
7452	(1$^-$ to 4$^+$)	5284		2167.6	2$^+$			
7485	(3$^-$,4$^+$)	1828	100	5657.0	5$^-$			
7497	(3,4,5$^-$)	1444	100 *10*	6053				I_γ: The γ intensity depopulating the 7497 level in 1976Gl10 only totals 90%, thus 10% of the γ intensity is unaccounted.
		3017	58 *10*	4480.1	4$^-$			
		3687	22 *6*	3810.3	3$^-$			
7507	7$^-$	1850	3 *2*	5657.0	5$^-$			
		2922	100 *2*	4585	5$^-$	E2		ΔJ=1, δ=+0.7 *3* for J=5 (1976Gl10). A_2=+0.61 *7*, A_4=−0.30 *8* (1976Gl10).
7528	(3$^-$ to 7$^-$)	1871	5 *3*	5657.0	5$^-$			
		2943	100 *3*	4585	5$^-$			
7539	(3,4,5)	1486		6053				
		3059		4480.1	4$^-$			
7663	(2$^+$ to 6$^+$)	2313	100	5349.6	4$^+$			
7667	(3$^-$ to 7$^-$)	993	52 *9*	6674	5$^-$			
		2010	100 *14*	5657.0	5$^-$			
7684	(3$^-$,4$^+$)	3204	100 *11*	4480.1	4$^-$			

$^{38}_{18}Ar_{20}$-7

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

$\gamma(^{38}Ar)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	δ[@]	Comments
7684	$(3^-,4^+)$	3873	49 *11*	3810.3	3^-			
		5516	64 *9*	2167.6	2^+			
7702	(1^+)	5534	100 *14*	2167.6	2^+			
		7701	43 *14*	0	0^+			
7786	$(2^-$ to $6^-)$	1744	100 *11*	6042	$(3^-,4^+)$			
		3306	85 *11*	4480.1	4^-			
7828	$(1^-$ to $5^-)$	4017	100	3810.3	3^-			
7857	$(1^-,2^+)$	4046	100 *25*	3810.3	3^-			
		5689	75 *25*	2167.6	2^+			
		7856	75 *25*	0	0^+			
7859	(6)	1185	100	6674	5^-			
7894	$(1^+,2^+)$	7893	100	0	0^+			
7899		1225	100	6674	5^-			
7911	$(3^-,4^+)$	2254	81 *8*	5657.0	5^-			
		2561	58 *8*	5349.6	4^+			
		3326	42 *8*	4585	5^-			
		3431	100 *12*	4480.1	4^-			
		4100	85 *12*	3810.3	3^-			
		5743	19 *8*	2167.6	2^+			
7992	$(1^-,2,3^-)$	5824	100	2167.6	2^+			
8068	$(3^-,4^+)$	2026	100 *20*	6042	$(3^-,4^+)$			
		4257	67 *15*	3810.3	3^-			
8077	7^+	789	7	7288	6^+			
		1669	100	6408	6^+	M1+E2	+0.72 *+21−16*	δ: for J=7 or −0.90 *+23−30* for J=5 (1976Gl10). A_2=+0.81 *12*, A_4=+0.04 *12* (1976Gl10).
8106	$(0^+$ to $4^+)$	5938	100	2167.6	2^+			
8124	$(3^-$ to $6^+)$	1450	37 *5*	6674	5^-			
		2774	24 *5*	5349.6	4^+			
		3539	100 *6*	4585	5^-			
8129	(6^-)	1059	100	7070	5^-	D+Q	+0.9 *+7−2*	δ: for J=6 or +0.34 *+30−25* for J=5 (1976Gl10). A_2=+0.92 *13*, A_4=−0.06 *14* (1976Gl10).
8181	$(3^-,4^+)$	6013	100	2167.6	2^+			
8215	$(3^-$ to $7^-)$	1541	35 *7*	6674	5^-			
		2558	100 *8*	5657.0	5^-			
8233	(1^-)	8232	100	0	0^+			
8261	$(3^-$ to $6^-)$	2604	89 *6*	5657.0	5^-			
		3676	100 *6*	4585	5^-			
		3781	33 *4*	4480.1	4^-			
8311	(1^+)	4500	100 *25*	3810.3	3^-			
		6143	89 *25*	2167.6	2^+			
8353	$(1,2^+)$	3788	80 *22*	4565.2	2^+			
		6185	100 *4*	2167.6	2^+			
		8352	42 *20*	0	0^+			

$^{38}_{18}Ar_{20}$-8

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

$\gamma(^{38}Ar)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Comments
8391	(2$^+$)	8390	100	0	0$^+$	
8417	(3$^-$ to 7$^-$)	2760	100	5657.0	5$^-$	
8481	(3$^-$ to 6$^-$)	3896	100 *10*	4585	5$^-$	
		4001	100 *10*	4480.1	4$^-$	
8488	(5,7)	1418	100	7070	5$^-$	A_2=+0.53 *8*, A_4=−0.53 *10* (1976Gl10). δ(E2/M1)=+1.1 *+5−4* for J=5; mult=Q for J=7; both for J=5 for 7070 level (1976Gl10).
8517	(1,2$^+$)	6349	100 *19*	2167.6	2$^+$	
		8516	11 *9*	0	0$^+$	
8520	(3$^-$ to 6$^-$)	3935	61 *6*	4585	5$^-$	
		4040	100 *13*	4480.1	4$^-$	
8568	8$^+$	491	18 *4*	8077	7$^+$	
		1061	18 *3*	7507	7$^-$	
		2160	100 *7*	6408	6$^+$	
8595	(3$^-$ to 7$^-$)	2938	100 *20*	5657.0	5$^-$	
		4010	100 *20*	4585	5$^-$	
8650	(3$^-$ to 6$^+$)	2597	25 *6*	6053		
		2993	100 *11*	5657.0	5$^-$	
8668	2$^+$	3792	100 *30*	4875.9	3$^-$	
		6500	100 *30*	2167.6	2$^+$	
8783	(3$^-$ to 7$^-$)	3126	100	5657.0	5$^-$	
8789	(4$^-$ to 7$^-$)	1719	100 *15*	7070	5$^-$	
		2115	54 *15*	6674	5$^-$	
8800		2758	100	6042	(3$^-$,4$^+$)	
8809	(4$^+$ to 8$^+$)	2401	100	6408	6$^+$	
8828	(3$^-$ to 7$^-$)	4243	100	4585	5$^-$	
8875	(3$^-$ to 6$^-$)	3218	50 *10*	5657.0	5$^-$	
		4290	50 *10*	4585	5$^-$	
		4395	100 *20*	4480.1	4$^-$	
8944	(4$^+$ to 7$^-$)	2536	35 *7*	6408	6$^+$	
		3287	100 *9*	5657.0	5$^-$	
8956	(4$^-$ to 7$^-$)	1886	72 *10*	7070	5$^-$	
		4371	100 *10*	4585	5$^-$	
8972	7$^-$	2564	100 *10*	6408	6$^+$	
		3315	15 *6*	5657.0	5$^-$	
		4387	47 *6*	4585	5$^-$	
8998	(4$^+$,5,6$^-$)	2590	100	6408	6$^+$	
9072	(4$^-$,5,6$^+$)	1722	65 *12*	7350	(3$^-$,4$^+$)	
		2002	100 *14*	7070	5$^-$	
		2398	67 *12*	6674	5$^-$	
9077	(1$^-$ to 5$^-$)	4201	100	4875.9	3$^-$	
9087	(3$^-$ to 7$^-$)	3430	100 *15*	5657.0	5$^-$	
		4502	37 *5*	4585	5$^-$	
9100	(1,2$^+$)	9099	100	0	0$^+$	

$^{38}_{18}Ar_{20}$-9

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 (continued)

$\gamma(^{38}Ar)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Comments
9158	(0$^+$ to 4$^+$)	6990	100	2167.6	2$^+$	
9170	(3$^-$ to 6$^-$)	4585	100 *12*	4585	5$^-$	
		4690	100 *12*	4480.1	4$^-$	
9199		1070	100	8129	(6$^-$)	
9204	(0$^+$ to 4$^+$)	7036	100	2167.6	2$^+$	
9260	(0$^+$ to 4$^+$)	7092	100	2167.6	2$^+$	
9293	(3$^-$ to 7$^-$)	4708	100	4585	5$^-$	
9300	(0$^+$ to 4$^+$)	7132	100	2167.6	2$^+$	
9330	(4$^+$ to 8$^+$)	2922	100	6408	6$^+$	
9338	8$^+$	2050	100	7288	6$^+$	δ(Q/D)=+0.73 *13* for J(9338)=6 and J(7288)=6, or +0.90 *+21−12* for J(9338)=4 and J(7288)=4 (1974Be68). A_2=+0.51 *6*, A_4=−0.26 *7* (1974Be68).
9349	(7$^-$)	3692	100 *17*	5657.0	5$^-$	
		4764	45 *13*	4585	5$^-$	
9374	(3$^-$ to 7$^-$)	4789	100	4585	5$^-$	
9437	(3$^-$ to 7$^-$)	3780	100	5657.0	5$^-$	
9460	(3$^-$ to 7$^-$)	4875	100	4585	5$^-$	
9535	8$^{(+)}$	967	100 *17*	8568	8$^+$	
		3127	85 *22*	6408	6$^+$	
9644	(5$^-$ to 9$^-$)	2137	100	7507	7$^-$	
9647	(2$^-$ to 6$^-$)	3046	100	6601		
9655	(3$^-$ to 7$^-$)	3998	100	5657.0	5$^-$	
9669	(3$^-$ to 7$^-$)	4012	100	5657.0	5$^-$	
9829		2759	100	7070	5$^-$	
9928	(9$^+$)	1360	100	8568	8$^+$	
10024	(8$^-$)	1900	100	8129	(6$^-$)	
		2954	100	7070	5$^-$	
10101	(3$^-$ to 7$^-$)	4444	100 *12*	5657.0	5$^-$	
		5516	69 *12*	4585	5$^-$	
10112	(4$^+$ to 8$^+$)	3704	100	6408	6$^+$	
10120		2043	100 *5*	8077	7$^+$	
		2613	28 *5*	7507	7$^-$	
10135		2628	100	7507	7$^-$	
10174	9$^-$	1202	100 *10*	8972	7$^-$	
		1606	100 *10*	8568	8$^+$	
10181		2674	100	7507	7$^-$	
10245		1757	100 *8*	8488	(5,7)	
		2738	59 *8*	7507	7$^-$	
10274	(4$^+$ to 8$^+$)	2986	100	7288	6$^+$	
10316	(3$^-$ to 7$^-$)	5731	100	4585	5$^-$	
10443	(4$^+$ to 8$^+$)	3155	100	7288	6$^+$	
10455	(5$^-$ to 8$^+$)	1967	100 *12*	8488	(5,7)	
		2948	100 *17*	7507	7$^-$	

$^{38}_{18}Ar_{20}$-10

$\gamma(^{38}Ar)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ #	E_f	J_f^π	E_i(level)	J_i^π	E_γ †	I_γ #	E_f	J_f^π
10455	(5^- to 8^+)	4047	76 *14*	6408	6^+	11163		3656	70	7507	7^-
10557		3050	100	7507	7^-	11174		2202	100	8972	7^-
10589	(4^+ to 7^-)	2460	26 *6*	8129	(6^-)	11199		2631	100	8568	8^+
		4181	100 *14*	6408	6^+	11290		1362	100	9928	(9^+)
		6003	74 *14*	4585	5^-	11297		1959	100	9338	8^+
10634	(6^+ to 10^+)	2066	100	8568	8^+	11379	(4^+ to 8^+)	4971	100	6408	6^+
10676	(4^+ to 8^+)	4268	100	6408	6^+	11428	(4^+ to 8^+)	5020	100	6408	6^+
10890		2761	59 *10*	8129	(6^-)	11434	(2^+,3^-)	6848	100	4585	5^-
		3383	100 *10*	7507	7^-	11452		2253	100	9199	
10947	(9^-)	2379	100 *7*	8568	8^+	11484	(7^- to 11^-)	1310	100	10174	9^-
		3877‡&	43 *7*	7070	5^-	11495		3418	100	8077	7^+
11068		2939	100	8129	(6^-)	11543		3466	100	8077	7^+
11078		1434	100	9644	(5^- to 9^-)	11547	(7^- to 11^-)	1373	100	10174	9^-
11087	(4^+ to 8^+)	3799	100	7288	6^+	11595		5187	100	6408	6^+
11109		2980	100	8129	(6^-)	11608		3531	100	8077	7^+
11163		2672	58	8488	(5,7)	11614	11^-	1440	100	10174	9^-
		3039	100	8124	(3^- to 6^+)	11620		1692	100	9928	(9^+)
		3086	76	8077	7^+	11630		2431	100	9199	

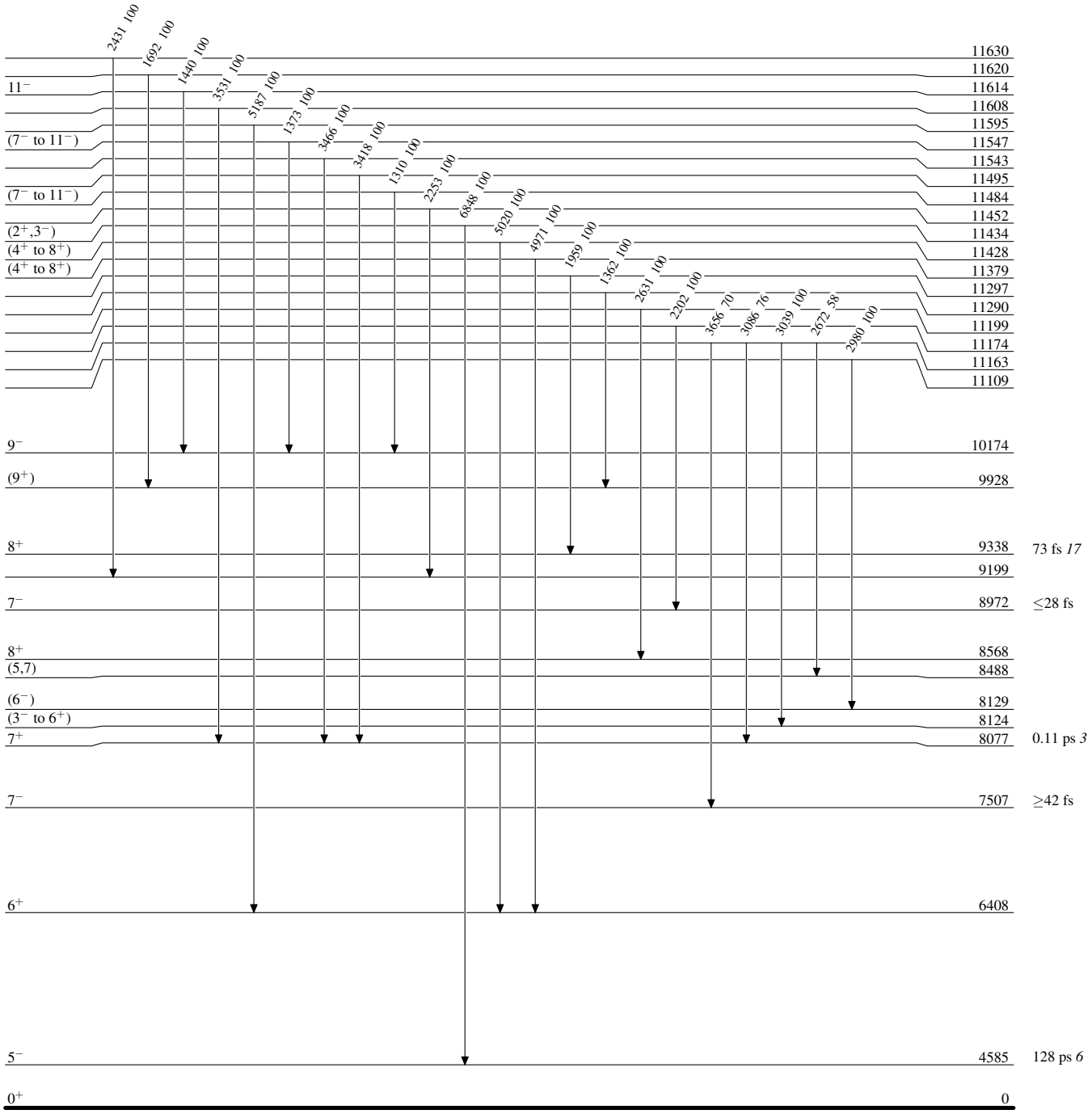
† Rounded values from level-energy differences.
‡ This transition which requires ΔJ=3 or 4 is not reported in (^{28}Si,α2pγ) (2002Ru01), thus it is considered as questionable by the evaluator.
# From 1971Ja10 up to 5657 level, from 1976Gl10 above 5657 up to 9928 level, and from 1980Ke01 above 9928 level, unless otherwise noted.
@ From p$\gamma(\theta)$ in 1967Ro16, 1974Be68 and 1976Gl10 and RUL based on measured $T_{1/2}$ where available.
& Placement of transition in the level scheme is uncertain.

$^{38}_{18}Ar_{20}$-11

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Level Scheme

Intensities: Relative photon branching from each level



$^{38}_{18}Ar_{20}$

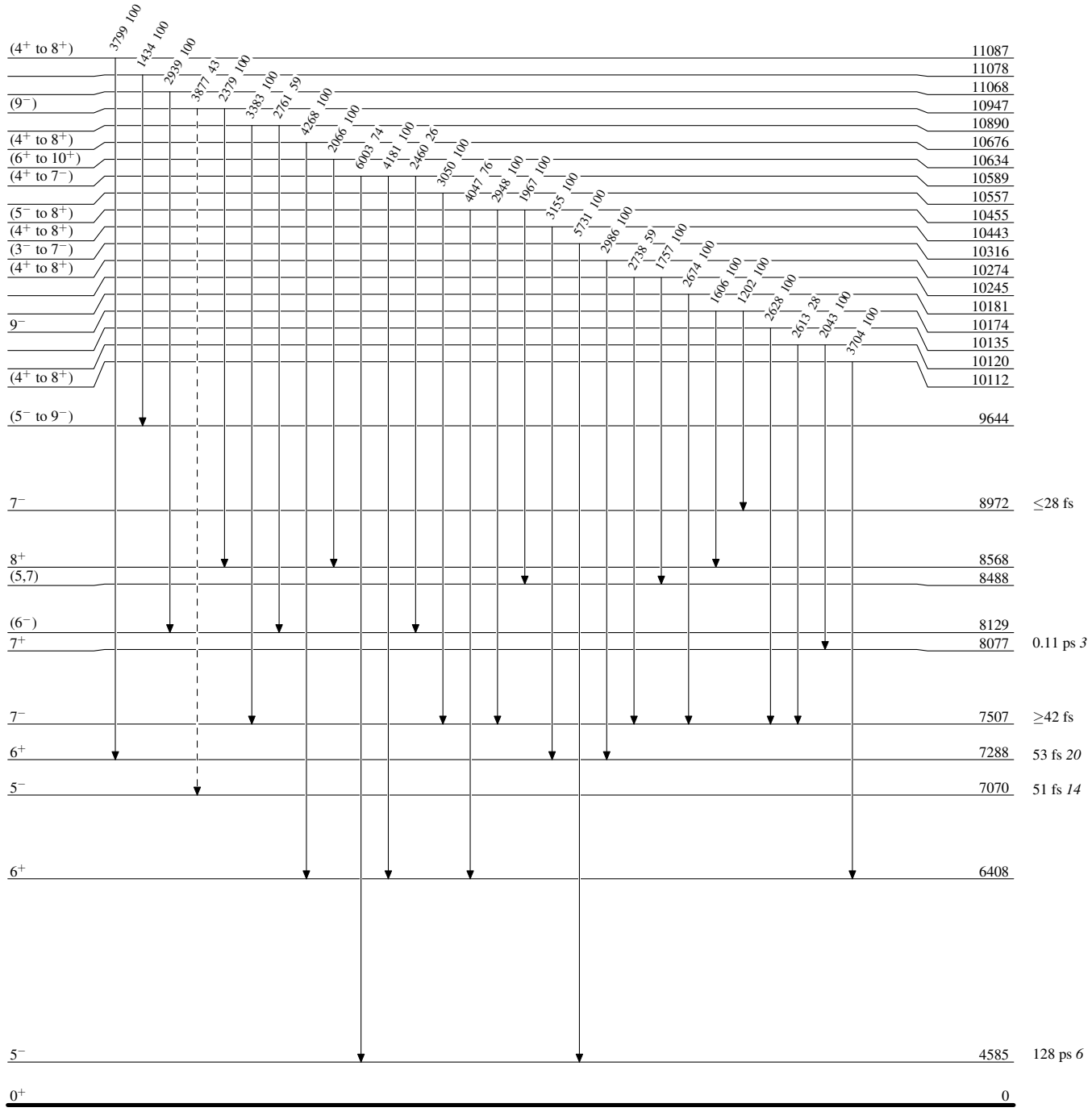
^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)

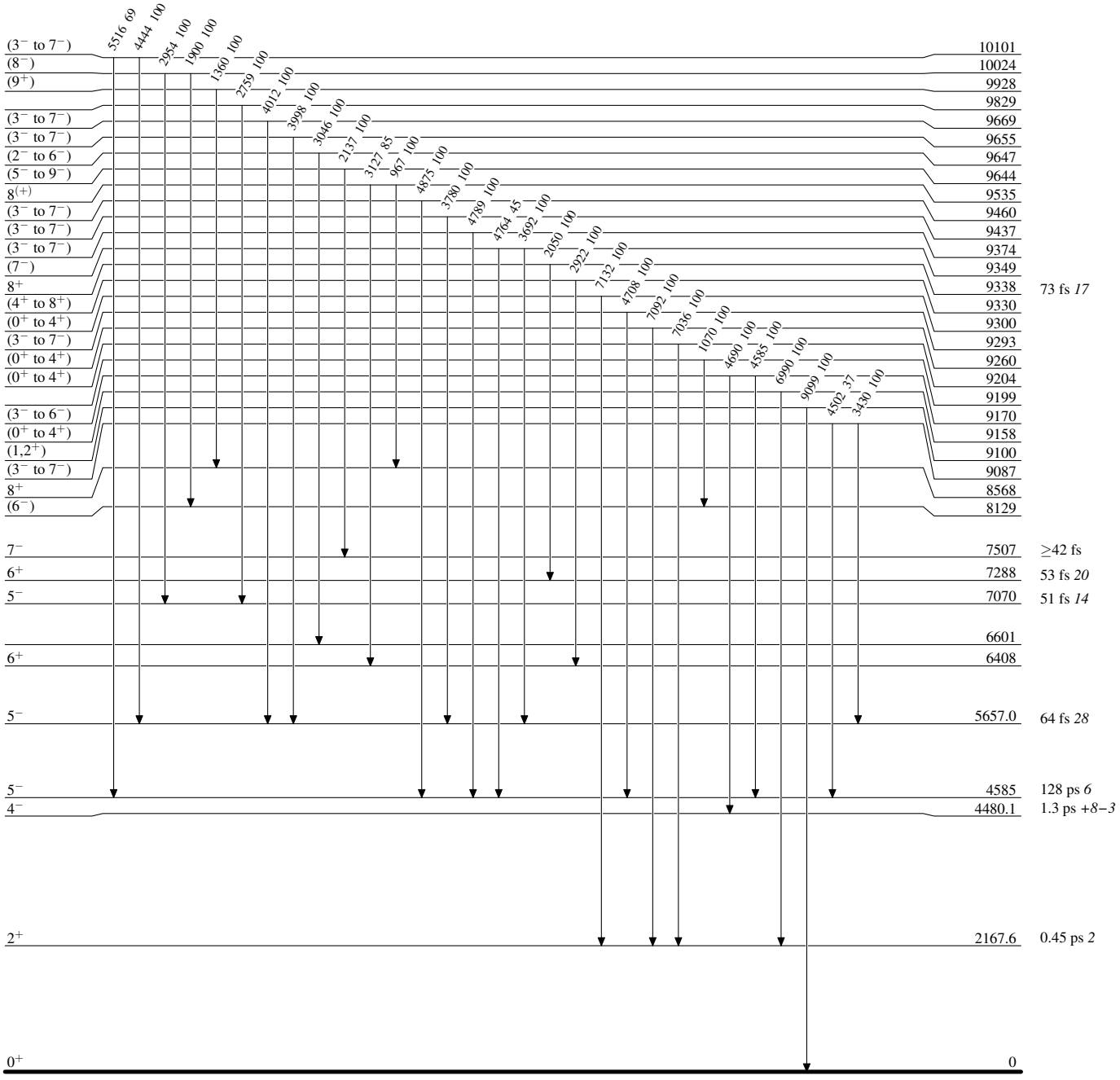


$^{38}_{18}Ar_{20}$

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Level Scheme (continued)

Intensities: Relative photon branching from each level

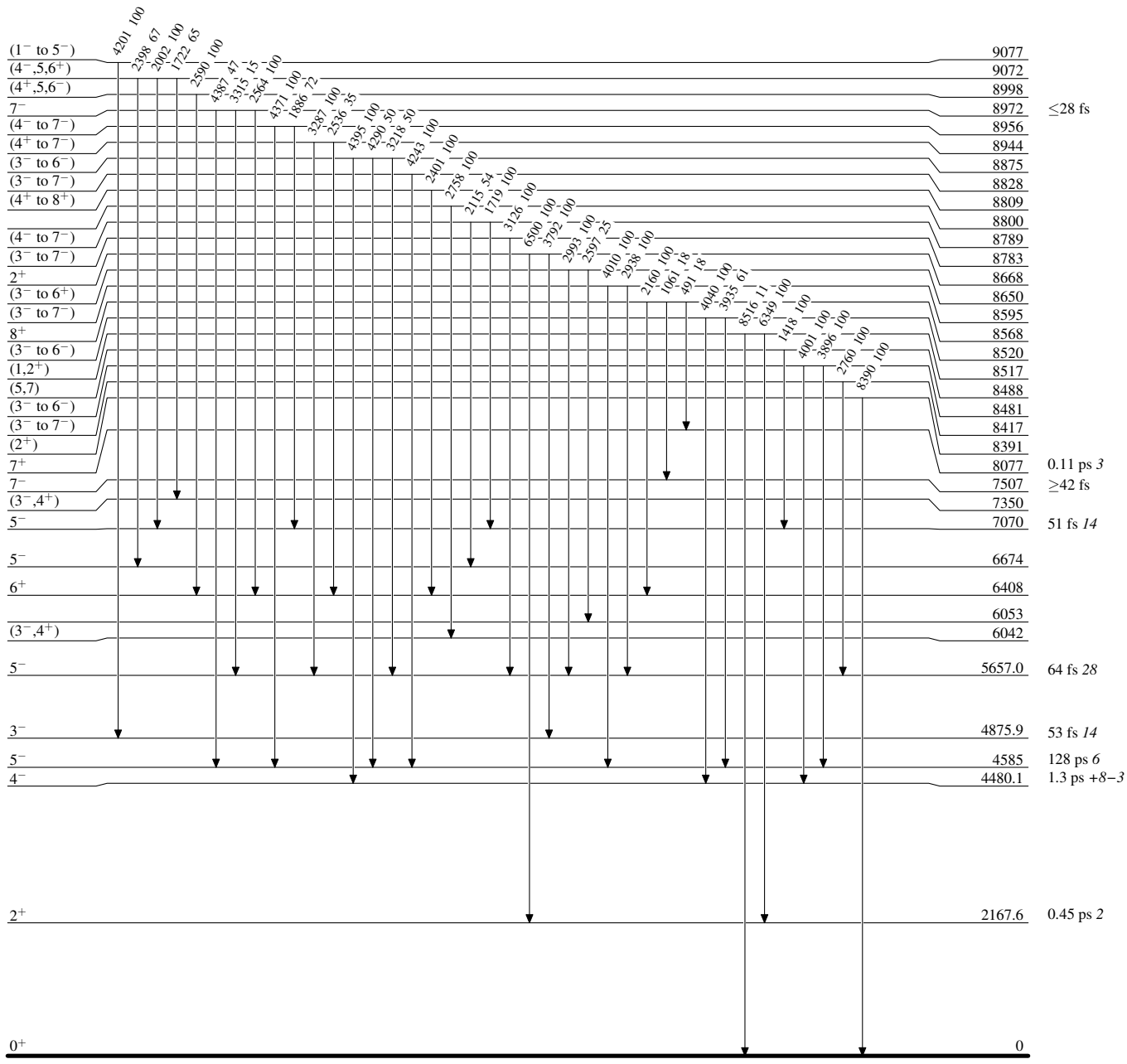


$^{38}_{18}Ar_{20}$

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Level Scheme (continued)

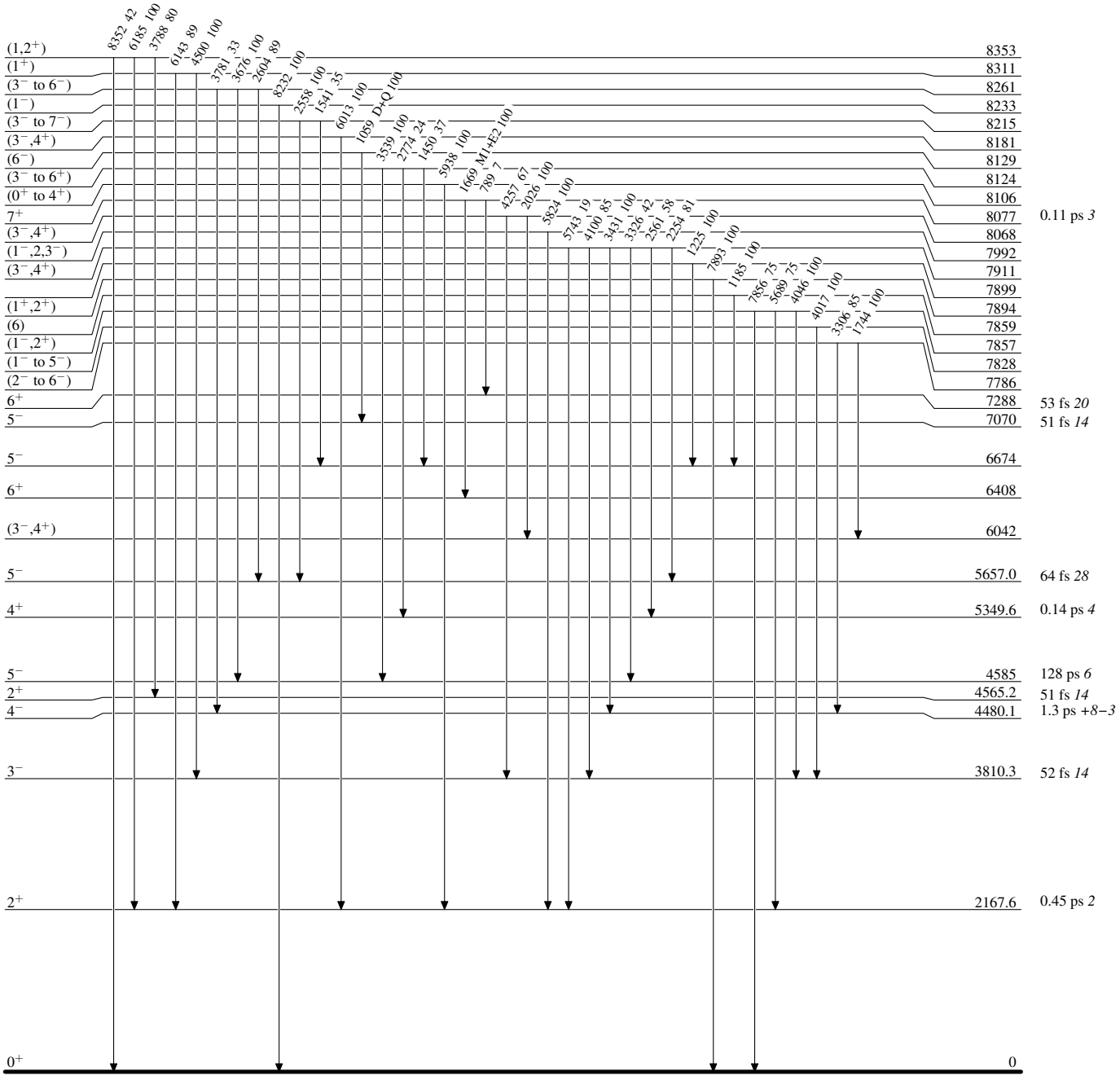
Intensities: Relative photon branching from each level



^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Level Scheme (continued)

Intensities: Relative photon branching from each level

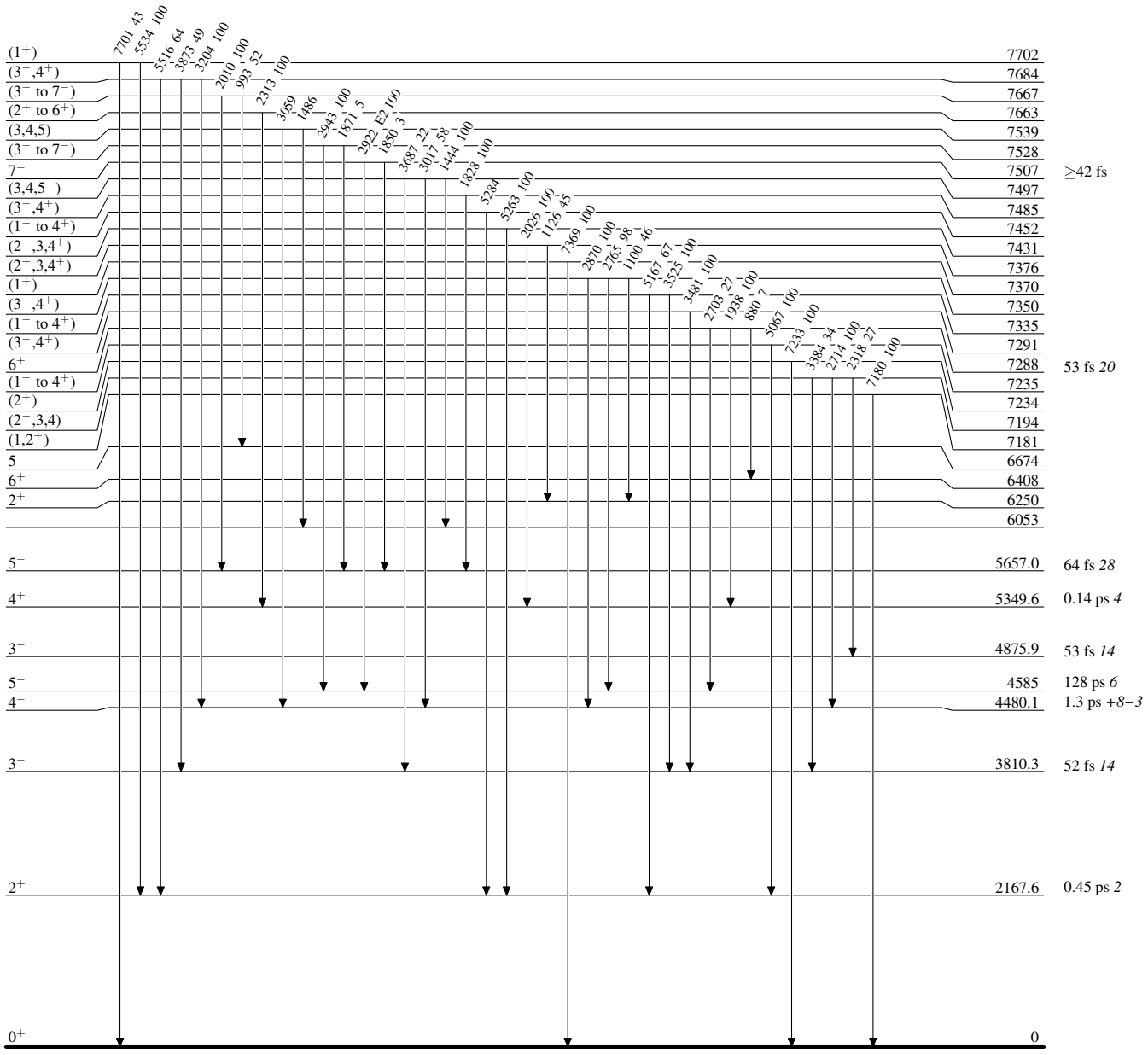


$^{38}_{18}Ar_{20}$

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Level Scheme (continued)

Intensities: Relative photon branching from each level



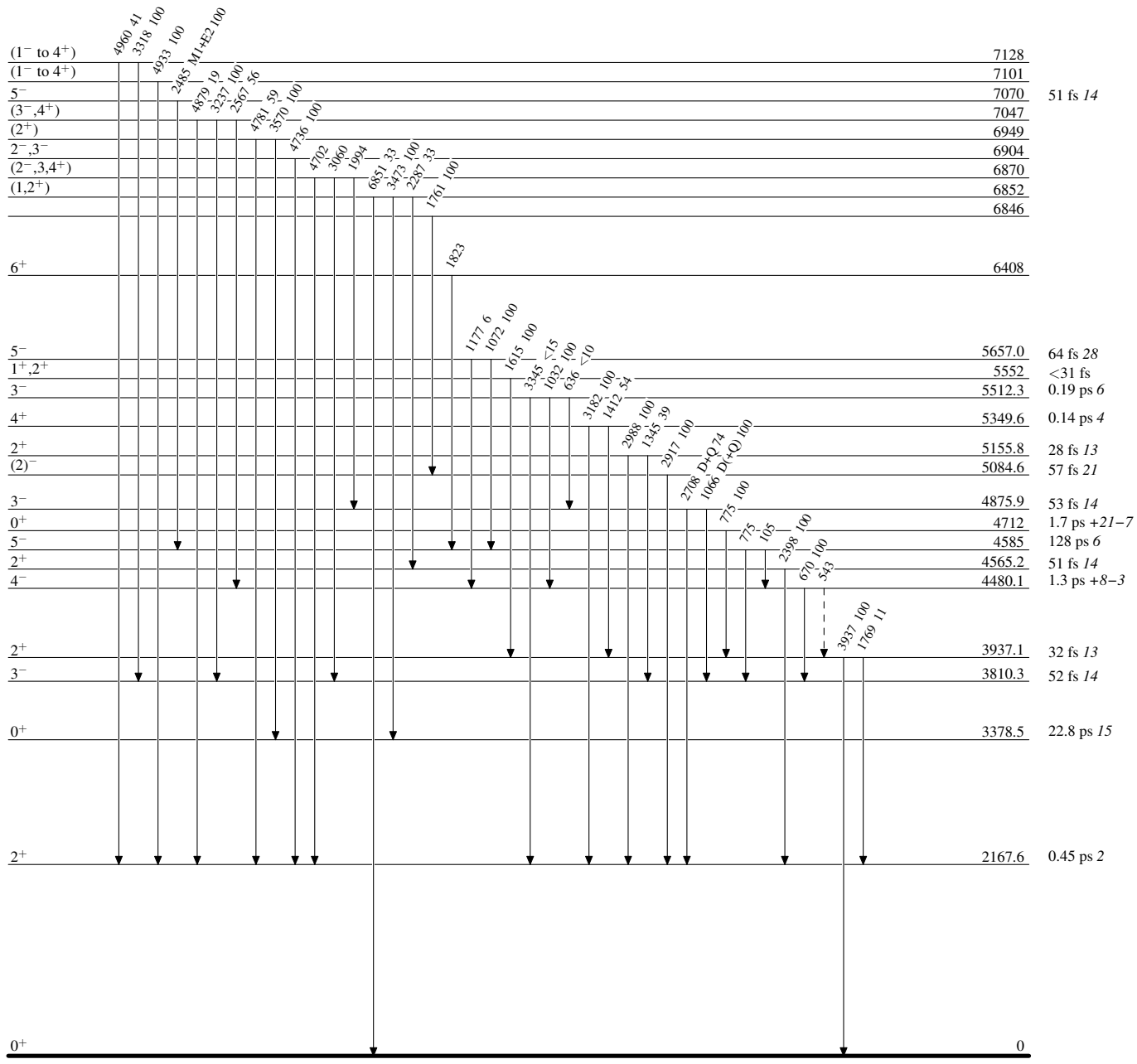
$^{38}_{18}Ar_{20}$

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10 Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

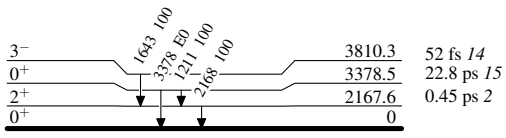


$^{38}_{18}Ar_{20}$

^{35}Cl(α,pγ) 1976Gl10,1980Ke01,1971Ja10

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{38}_{18}Ar_{20}$