Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, Balraj Singh	NDS 113,1563 (2012)	28-May-2012

Q(β^-)=−1.72×10^4 *syst*; S(n)=17065.3 *4*; S(p)=4663.9 *4*; Q(α)=−6744.2 *4* 2012Wa38
Note: Current evaluation has used the following Q record −17157 syst 17064.4 *5* 4663.1 *6* −6740 3 2011AuZZ.
ΔQ(β^-)=298 (2011AuZZ).
Q(εp)=919.5 *3*, S(2n)=32319.7 *18*, S(2p)=6939.8 *3* (2011AuZZ).
Values in 2003Au03: Q(β^-)=16900 *300* (syst), S(n)=17064.4 *5*, S(p)=4662.8 *6*, Q(α)=−6740 *3*, Q(εp)=919.8 *4*, S(2n)=32319.6 *18*, S(2p)=6939.5 *4*.
Identification and production of ^{34}Ar isotope: 1966Mi11 and 1967Ba36 in ^{32}S + ^{3}He reaction; measured half-life.
^{34}S(π^+,π^-): 1993Bi10, 1991Bi07 (E=50 MeV), 1987Zu03 (E=292 MeV), measured σ.
Additional information 1.
Mass measurement: 2002He23 (also 2001He29,2001He37).
Nuclear radius measurement: 2002Oz03.
Structure calculations: 2006Or01 (levels, B(E2), shell model); 2005Ob01 (deformation, levels).
2007DoZV: found 1197γ and 2090γ (with two-step fragmentation reaction at relativistic energies) ^{9}Be(^{37}Ca,Xγ) E=197.5 A MeV reaction).
2011Le01, 2010Le03: experimental (by two methods) and theoretical neutron spectroscopic factors and reduction factors for ^{34}Ar g.s. extracted from reaction p(^{34}Ar,d), E(^{34}Ar)=33 MeV/nucleon.

^{34}Ar Levels

Cross Reference (XREF) Flags

A	^{35}Ca εp decay (25.7 ms)	D	^{32}S(^{3}He,n)
B	^{1}H(^{34}Ar,P′)	E	^{36}Ar(p,t)
C	^{3}He(^{32}S,nγ),^{32}S(^{3}He,nγ)		

E(level)	J$^\pi$	T$_{1/2}$[†]	XREF	Comments
0	0$^+$	843.8 ms *4*	ABCDE	%ε+%β^+=100 <r^2>$^{1/2}$=3.365 fm *4* (2004An04 evaluation and its 2008 update on webpage: http://cdfe.sinp.msu.ru). δ<r^2>(^{38}Ar,^{34}Ar)=−0.251 fm^2 *6 62*, first is statistical and the second is systematic uncertainty (1996Kl04, 2000Ge20). T$_{1/2}$: from 2006Ia05, half-life measured and analyzed using parent-daughter (^{34}Ar to ^{34}Cl decay) composite decay and a new fitting procedure, gas-ionization chamber used as detection system. Beam of pure ^{34}Ar ions was produced in ^{1}H(^{35}Cl,2n) reaction. Others: 844.5 ms *34* (1974Ha26, also 1972Ha58), 0.85 s *10* (1967Ba36), 1.2 s *3* (1966Mi11). Additional information 2.
2091.1 *3*	2$^+$	319 fs *42*	ABCDE	β_2(p,p′)=0.27 *2* (2001Kh17). J$^\pi$: L(p,t)=L(p,p′)=2. T$_{1/2}$: 2001Ra27 evaluation lists 305 fs *49* which is close to the value given here from 1985Al18. It seems a somewhat different averaging procedure is used in 2001Ra27.
3287.7 *5*	2$^+$	194 fs *35*	A CDE	J$^\pi$: L(p,t)=2.
3873 *3*	0$^+$	>187 fs	A CDE	J$^\pi$: L(p,t)=0.
4050 *14*			DE	
4127.8 *10*		<208 fs	CD	
4513.2 *8*	3$^-$	201 fs *38*	BCDE	β_3(p,p′)=0.39 *3* (2001Kh17). J$^\pi$: L(p,p′)=L(^{3}He,n)=3.
4631 *4*			C E	
4865 *4*			C E	
4967 *4*	0$^+$		CDE	J$^\pi$: L(p,t)=0.

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Adopted Levels, Gammas (continued)

^{34}Ar Levels (continued)

E(level)	J^π	XREF	Comments
5255? *4*		C	
5307 *13*	(5^-)	DE	J^π: L(^{3}He,n)=(5).
5542 *4*		C	
5620 *30*	2^+	D	J^π: L(^{3}He,n)=2.
5909 *12*	0^+	DE	J^π: L(^{3}He,n)=0.
6074 *11*	2^+	E	J^π: L(p,t)=2.
6525 *9*	2^+	DE	J^π: L(p,t)=2.
6794 *11*		DE	
6990 *50*		D	
7322 *6*	2^+	DE	J^π: L(p,t)=2.
7499 *4*	(2^+)	E	J^π: L(p,t)=(2).
7925 *5*		E	

† From DSAM in ^{3}He(^{32}S,nγ),^{32}S(^{3}He,nγ). Most values are from 1985Al18.

$\gamma(^{34}Ar)$

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.†	δ†	Comments
2091.1	2^+	2091.1 *3*	100	0	0^+	E2		B(E2)(W.u.)=6.8 *9*
3287.7	2^+	1196.6 *4*	100 *5*	2091.1	2^+	M1+E2	+0.12 *5*	B(M1)(W.u.)=0.060 *12*; B(E2)(W.u.)=2.4 *20*
		3286 *4*	9 *6*	0	0^+	[E2]		B(E2)(W.u.)=0.10 *7*
3873	0^+	585#	<43	3287.7	2^+			
		1782 *3*	100	2091.1	2^+	[E2]		B(E2)(W.u.)<21
4127.8		840.1 *9*	100 *6*	3287.7	2^+			
		2037	11 *6*	2091.1	2^+			
		4128#	<11	0	0^+			
4513.2	3^-	1225.5 *6*	100 *11*	3287.7	2^+	[E1]		B(E1)(W.u.)=0.0016 *4*
		2422	11 *3*	2091.1	2^+	[E1]		B(E1)(W.u.)=2.2×10^{-5} *8*
4631		2540	100	2091.1	2^+			%Iγ>50.
4865		2774	100	2091.1	2^+			%Iγ>50.
4967	0^+	841#	<20	4127.8				
		2876	100	2091.1	2^+			%Iγ>50.
5255?		3164#	100	2091.1	2^+			%Iγ>50.
5542		911	54‡ *16*	4631				
		1029	100‡ *16*	4513.2	3^-			

† From ^{3}He(^{32}S,nγ),^{32}S(^{3}He,nγ).
‡ Tentative value of branching ratio.
# Placement of transition in the level scheme is uncertain.

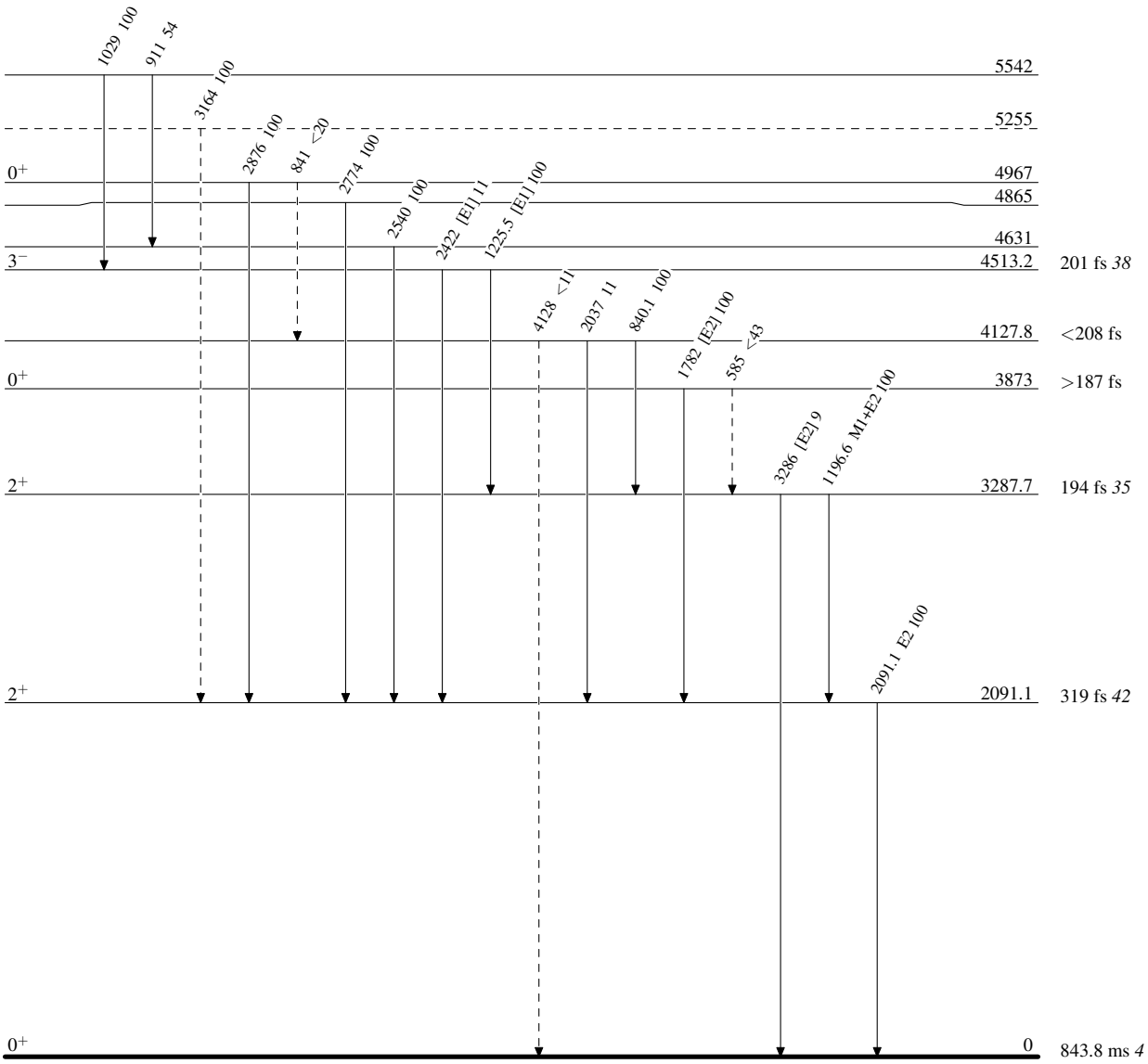
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{34}_{18}Ar_{16}$

Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, John Cameron and Balraj Singh	NDS 113,1 (2012)	31-Dec-2011

Q(β^-)=−12814.5 *4*; S(n)=15255.5 *8*; S(p)=8506.97 *4*; Q(α)=−6640.92 *3* 2012Wa38
Note: Current evaluation has used the following Q record −12814.21 *35* 15255.5 *8* 8506.99 *5*−6640.92 *3* 2011AuZZ.
S(2n)=27996.79 *34*, S(2p)=14877.82 *6* (2011AuZZ).
Values in 2003Au03: Q(β^-)=−12805 *8*, S(n)=15255.4 *7*, S(p)=8506.97 *5*, Q(α)=−6640.76 *14*, S(2n)=27997.0 *4*, S(2p)=14877.69 *11*.
In XREF table, levels populated in reactions labeled by XREF=Y:
^{1}H(^{35}Cl,α):res: 9117.
^{9}Be(^{40}Ca,^{13}Cγ): 0, 1970.
^{28}Si(^{32}S,^{24}Mg): 0, 1970.
^{36}Ar(p,p′γ): 0, 1970.
^{40}Ca(p,pα),(p,p′α): 0, 1970, 4414.
^{40}Ca(pol p,pα): 0, 1970.
^{40}Ca(p,p$\alpha\gamma$): 0, 1970.
^{40}Ca(α,2α): 0, 1970, 4329.
^{40}Ca(^{40}Ca,X): 0, 1970, 4414.
^{197}Au(^{36}Ar,^{36}Ar′γ): 0, 1970.
^{206}Pb(^{36}Ar,^{36}Ar′γ): 0, 1970.
^{36}Ar identified in mass spectrometer studies by F. W. Aston, Nature 105, 8 (1920).
The ^{35}Cl(p,γ),(p,p′),(p,α):res dataset is abbreviated as ^{35}Cl(p,γ):res.
2008ChZL: measurement of double β decay of ^{36}Ar.
2011Le01: ^{1}H(^{36}Ar,d) E=33 MeV/nucleon; measured $\sigma(\theta)$; deduced neutron ground-state spectroscopic factors.

^{36}Ar Levels

Cross Reference (XREF) Flags

A	^{36}Cl β^- decay (3.01×10^5 y)	M	^{33}S(α,nγ)	Y	^{1}H(^{35}Cl,α):res
B	^{36}K ε decay (342 ms)	N	^{35}Cl(p,γ),(p,p′),(p,α):res	Z	^{9}Be(^{40}Ca,^{13}Cγ)
C	^{37}Ca εp decay (181.1 ms)	O	^{35}Cl(d,nγ)	Others:	
D	^{40}Sc $\varepsilon\alpha$ decay (182.3 ms)	P	^{35}Cl(^{3}He,d)	AA	^{28}Si(^{32}S,^{24}Mg)
E	^{2}H(^{35}Cl,nγ)	Q	^{36}Ar(e,e′)	AB	^{36}Ar(p,p′γ)
F	^{12}C(^{32}S,^{8}Be)	R	^{36}Ar(p,p′)	AC	^{40}Ca(p,pα),(P,P′α)
G	^{20}Ne(^{16}O,^{16}O),(^{16}O,^{12}C):fusion	S	^{36}Ar(d,d′)	AD	^{40}Ca(pol P,Pa)
H	^{24}Mg(^{12}C,α),(^{12}C,^{12}C):fusion	T	^{36}Ar(α,α),(α,α′)	AE	^{40}Ca(P,p$\alpha\gamma$)
I	^{24}Mg(^{20}Ne,2$\alpha\gamma$)	U	^{38}Ar(p,t)	AF	^{40}Ca(α,2α)
J	^{32}S(α,γ):res	V	^{39}K(p,α)	AG	^{40}Ca(^{40}Ca,X)
K	^{32}S(^{6}Li,d)	W	^{40}Ca(d,^{6}Li)	AH	^{197}Au(^{36}Ar,^{36}Ar′γ)
L	^{32}S(^{16}O,^{12}C)	X	^{40}Ca(^{3}He,^{7}Be)	AI	^{206}Pb(^{36}Ar,^{36}Ar′γ)

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0[d]	0$^+$#	stable	ABCDEF IJKLMNOPQRSTUVWX Z	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI Nuclear rms charge radius: 3.3902 fm *20* (2004An14,evaluation); 3.3901 fm *23* from 2008 update of 2004An14. Spin measurement by optical spectroscopy (1937Ko03,1953Me73).
1970.38[d] *5*	2$^+$#	328 fs *20*	BC EF IJKLMNOPQRSTUVWX Z	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI μ=+0.10 *4* (2006Sp01,2011StZZ) Q=+0.11 *6* (1971Na06,1989Ra17,2011StZZ) μ: transient-field method (2006Sp01).

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Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Q: measured by Coulomb excitation reorientation (1971Na06, ^{206}Pb(^{36}Ar,^{36}Ar′γ)). $T_{1/2}$: weighted average (in fs) of: 310 *31* (^{9}Be(^{40}Ca,^{13}Cγ)), 341 *20* (^{36}Ar(e,e′)), 335 *27* (^{197}Au(^{36}Ar,^{36}Ar′γ)), 305 *49* (^{206}Pb(^{36}Ar,^{36}Ar′γ)), 319 *78* (^{32}S(α,γ):res), 319 *28* (^{35}Cl(p,γ):res); other: 450 *14* (^{12}C(^{32}S,^{8}Be)). 2001Ra27 evaluation gives adopted τ=463 fs *46* or $T_{1/2}$=321 fs *32*.
4178.32 *11*	3⁻	2.3 ps *3*	BC EF IJKLMNOPQRSTUV X	B(E3)=0.0111 *11* (2002Ki06 evaluation), data from lifetime and (e,e′).
4329.1[e] *7*	(0,1,2)+[#]	>485 fs	C I KL N P S V	XREF: Others: AF
4414.40[d] *16*	4+[#]	76 fs *10*	EF I LMN P RST W	XREF: Others: AC, AG
4440.11 *19*	2+	76 fs *14*	B I LMN P UVWX	Jπ: π from 2699.4, M1+E2 γ from 3+, 7140; L=4 in ^{40}Ca(d,^{6}Li).
4951.4[e] *4*	2+[#]	<35 fs	B F I KL N P V	
4974.05 *18*	2⁻	10 ps *3*	B E MN P RS V	
5171.13 *16*	5⁻	88 ps *3*	EF I KLMNOP S V	
5194.4 *8*	(0+,1+,2+,3⁻)	69 fs *21*	KL N P R V	
5836.0 *4*	1⁻	6.2 fs *21*	KL N P	
5856.65 *19*	3⁻	0.31 ps *10*	KL N P V	
5878? *9*	(2+)		RS V X	Jπ: from ^{36}Ar(p,p′).
5895.92 *19*	4⁻	0.35 ps *14*	MN V	
6136.5[e] *15*	4+[#]		I KLMN V	Jπ: E1 γ from 5⁻, 9927 (^{35}Cl(p,γ):res); E2 γ to 2+, 1970 (^{24}Mg(^{20}Ne,2αγ)).
6217.3 *3*	5⁻	201 fs *35*	LMN R V	
6356.0 *6*	4+	0.31 ps *10*	N R V X	
6611.0 *3*	2+	15 fs *6*	B N P UV	T=1 Jπ: log *ft*=3.5 (^{36}K ε decay).
6645.6 *15*	(2+,3+,4+)		N V	
6724 *2*	NOT (2)+		N P x	Jπ: not 1+ (^{35}Cl(p,γ):res) and (1,2)+ from ^{35}Cl(^{3}He,d).
6731.0 *5*	1+,2+		B x	Jπ: log *ft*=5.11 from 2+; γ to 0+.
6835.16 *19*	4⁻	0.56 ps *17*	E N P	
6836.50 *18*	3⁻	166 fs *42*	KL N	
6866.9 *7*	(1+,2+)		B L N P R V	E(level): 6868.5 *10* (1972Ho40), 6865.2 *10* (1974Jo02). Jπ: (1,2+) from ^{35}Cl(p,γ):res; π=− from L=(0) in ^{35}Cl(^{3}He,d).
7136.5 *9*	(1⁻,2+)	9 fs *3*	N P	
7139.6 *4*	3+	69 fs *35*	B N	
7178.9 *4*	(1,2)+		B N P V	Jπ: (1,2+) from ^{35}Cl(p,γ):res; π=+ from L=0 in ^{35}Cl(^{3}He,d).
7247.4 *6*	(1,2,3)⁻	<21 fs	N P	Jπ: 0+,1,2,3,4+ from γ to 2+, 1970; (1,2,3)⁻ from π=− (^{35}Cl(^{3}He,d)).
7258.6 *8*	3⁻	<14 fs	N R V	
7336.6 *6*	3+	10 fs *5*	B N P V	T=1
7353.9 *3*	6⁻	125 fs *28*	I MN V	
7432.3 *7*	1+	1.5 fs *3*	L N PQ V	Jπ,$T_{1/2}$: from ^{36}Ar(e,e′).
7488 *16*	(2⁻)		QR V	E(level): weighted average of values from datasets.

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Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Jπ: from ^{36}Ar(e,e′).
7573.1 *3*	4^-	159 fs *49*	N V	
7672.1 *6*	$(3)^-$		L N P V	Jπ: not$(1,2)^-$ from ^{35}Cl(p,γ):res and $(2,3)^-$ from ^{35}Cl(^{3}He,d).
7706? *10*	$^-$		P	Seen only in ^{35}Cl(^{3}He,d). Jπ: π=− from L=1 in ^{35}Cl(^{3}He,d).
7710.3 *5*	1^+		B N V	T=1 E(level): 7710.7 *18* (1972Ho40), 7711.1 *15* (1974Jo02). Jπ: $1^+,2^+,3^+$ from log *ft*=4.9 (^{36}K ε decay); 1 from ^{35}Cl(p,γ).
7749.7 *5*	2^-		L N PQR V	Jπ: from ^{36}Ar(e,e′).
7767.0[e] *4*	6^+[#]	76 fs *11*	I M V	E(level),$T_{1/2}$: from ^{24}Mg(^{20}Ne,2αγ). Jπ: ΔJ=2 E2 γ to 4^+ 6137 (2^+ less likely by no γ to 0^+ g.s.).
7879 *2*	$(1,2)^-$		L N P V	Jπ: not $(1,3)^-$ from ^{35}Cl(p,γ):res; π=− from L=1 in ^{35}Cl(^{3}He,d).
7971.4 *7*	$1^+,2^+$		B P R V Y	XREF: Others: AD, AF, AG, AH, AI XREF: P(7965,8010). E(level): from ^{36}K ε decay. Jπ: $1^+,2^+,3^+$ from log *ft*=5.4 from 2^+ parent (^{36}K ε decay); 3^+ less likely from no γ to 0^+, g.s.
8015.9 *10*	$(3,4)^-$		N VW Y	XREF: Others: AI XREF: V(8030,8070).
8131.9 *6*	1^+	1.6 fs *4*	B N PQ V	T=1 E(level): from ^{36}Ar(e,e′).
8231 *16*			L P V	
8288 *4*			K M	
8303 *3*	2^-		PQ V	Jπ: from ^{36}Ar(e,e′).
8332.5 *15*	$(3)^-$		N P	Jπ: from ^{35}Cl(^{3}He,d).
8353 *3*	$(1^-,2^+,3^-)$		B	Jπ: from ^{36}K ε decay (α-decayed level).
8365 *3*	2^-		PQ	Jπ: from ^{36}Ar(e,e′).
8398 *3*			B P	
8449 *3*	$(^-)$		P	Jπ: L(^{3}He,d)=(1+3) from $3/2^+$ target.
8472.0 *10*	$(3^-,4^-,5^-)$	30 fs *7*	N P	
8504 *3*	1^+	30 fs *7*	K PQ	Jπ: from ^{36}Ar(e,e′).
8556.3 *10*	2^+		B P R U	T=1 Jπ: $1^+,2^+$ from L(^{3}He,d)=0 from $3/2^+$ parent.
8593 *4*			M	
8672 *3*	$(^-)$		K P	Jπ: from L=(1) in ^{35}Cl(^{3}He,d).
8739 *4*			M R	
8806.4 *18*	$(0^-,1,2,3^-)$		N P	Jπ: from ^{35}Cl(^{3}He,d).
8850 *3*			B	
8887 *4*	$(\leq 5^-)$		P	Jπ: from ^{35}Cl(^{3}He,d).
8909.1 *9*	2^+		B JK	Jπ: ΔJ=2, E2 γ to 0^+, g.s.
8921.6 *23*			M P	
8938.8 *5*	$(2^+,3,4^-)$		N P	
9014.9 *10*	$(3^-,4,5^-)$		N P	
9024.8 *8*	2		B N	
9066.4 *6*	3^-		N P	
9117.0 *10*	1^-		J N Y	Jπ: ΔJ=1, E1 γ to 0^+, g.s.
9132.5 *7*	3^-		N Q	Jπ: from ^{35}Cl(p,γ):res; 2^- in ^{36}Ar(e,e′).
9144.9 *7*	$(2^+,3^-)$		B N	
9186[d] *4*	(6^+)[#]		I M	E(level): from ^{33}S(α,nγ).

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Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
				Jπ: from ^{24}Mg(^{20}Ne,2αγ).
9192.1 *11*	(3⁻,4⁺)		N	
9220.2 *11*	1⁺		B N R	T=1
9240.5 *11*	2⁻		K N Q	Jπ: from ^{36}Ar(e,e′).
9248.4 *11*	(1⁻,2⁻,3⁻)		N	
9258.3 *12*	3⁻		N	
9270? *40*	(1⁺)		Q	
9300.1 *4*	4⁻		N P	T=1
9342.5 *4*	3⁻		N	T=1
9356.0 *8*	2⁺		J N	Jπ: from ^{32}S(α,γ):res.
9365.9 *8*	1⁻		B N	
9374.1 *13*	(1⁻,2⁻,3⁻)		N	
9379.9 *13*	(2⁺,3⁺,4⁺)		B N	
9393.4 *10*	(2⁺,3⁺,4⁺)		N	
9413.9 *29*			MN	
9439.2 *14*	(2⁺,3⁺,4⁺)		N	
9448.1 *9*	1⁻,2⁺,3⁻		J N	
9465.9 *5*	1⁻,2⁺		B J N	
9474.0 *8*	(1,2)		N	
9494.3 *12*			N	
9502.8 *5*	(2,3)		B N	Jπ: (2,3) from ^{35}Cl(p,γ):res; 1⁺,2⁺,3⁺ from log *ft*=4.1 from 2⁺ parent (^{36}K ε decay).
9509.6 *6*	(2⁺,3⁺,4⁺)		N	
9542.0 *11*	(1,2,3)⁻		N	
9550.3 *5*	(0⁺ to 4⁺)		N	
9574.3 *4*	4⁻		N	
9595.4 *7*	2⁺		N	
9606.8 *5*	(0,1,2)⁻		N	
9667.1 *10*	3⁻		N	
9681.9 *5*	4⁺,6⁺		N	
9700 *30*	0⁺		N U	T=1 Jπ: from agreement of experimental and calculated cross sections in (p,t).
9703.2 *14*	(1⁻,2⁺)		B	Jπ: from comparison of experimental and calculated cross sections in (p,t).
9734.3 *5*	1⁻,3⁻,4⁺		N	
9737.5 *8*	3⁻		B N	
9764.5 *5*	(3⁻,4⁻,5⁻)		N	
9812.2 *5*	(1,2,3⁻)		B N	
9862.6 *5*	3⁺		N	
9878.6 *5*	2⁺,3⁺		B N	Jπ: (2⁺,3⁺,4⁺) from ^{35}Cl(p,γ):res; 1⁺,2⁺,3⁺ from log *ft*=5.5 from 2⁺ parent (^{36}K ε decay).
9889.3 *5*			N	
9902.1 *5*	4⁺		N	
9927.0[e] *5*	8⁺[#]	27.4 fs *43*	I	E(level),Jπ,$T_{1/2}$: from ^{24}Mg(^{20}Ne,2αγ).
9927.4 *5*	5⁻		MN	
9942.5 *5*	(2,3⁻)		N	
9956.9 *5*	(1,2⁺)		B N	
9982.6 *16*	(1,3)⁻		N	
9983.2 *5*	1⁺,(2⁺)		N	
9991.9 *16*	1⁻,2⁺		N	
9992.9 *9*			B N Q	
10002.4 *10*	(1⁻,2,3)		N	
10044.4 *12*	1⁻		N	
10050? *60*	1⁺		Q	E(level),Jπ: from ^{36}Ar(e,e′).

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Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

E(level)†	Jπ‡	XREF	Comments
10050.6 *15*	2^+	N	
10076.7 *5*	$(1^-,2,3)$	B K N	
10092.3 *29*		N	
10094.9 *15*	2^+	N	
10099.4 *6*	1^-	N	
10139.5 *9*	$(2^+,3^-)$	N	
10143.0 *6*	$(1^-,2)$	N	
10149.6 *5*	$(3^-,4)$	N	
10167.4 *5*	3^-	N	
10173.4 *5*	$(1^-,2^+)$	N	
10186	1^-	J	Jπ: ΔJ=1, E1 γ to 0^+, g.s.
10193.6 *10*	$(3^-,4,5,6^+)$	N	
10201.3 *18*		B N	
10217 *4*	2^+	J	Jπ: ΔJ=2, E2 γ to 0^+, g.s.
10220.3 *5*	$4^{(-)}$	N	
10256.0 *10*	$(3^-,4)$	N	
10257.5 *10*	$(3^-,4^+)$	N	
10260.5 *19*		N	
10267.3 *5*	1^-	N	
10271.7 *6*	$(3^-,4^-,5^-)$	N Q	
10281.1 *10*	3^-	N	
10301.5 *9*	4^+	N	
10308.7 *8*	$(2,3)^-$	N	
10319.5 *15*	2^+	N	
10328 *11*	2^+	B J	
10329.0 *15*	$(3^-,4^-,5^-)$	N	
10377.1 *19*		N	
10420.8 *10*	3^-	N Q	
10435.0 *14*	$(1,2,3^-)$	N	E(level),Jπ: strong γ to 0^+ suggests J^π=1,2,3$^-$. In ^{35}Cl(p,p$_0$) data, J^π=$(1,2,3)^-$ is proposed, but 2^+ is suggested from γ-ray data (as commented in 1978En04 evaluation). This level may be a doublet.
10439.4 *19*	2^+	N	
10449 *3*		B	
10462.2 *9*	2^-	N	
10475.3 *21*		N	
10488.1 *20*	3^-	J N	E(level): from ^{32}S(α,γ):res.
10500.2 *5*	$(1,2,3)^-$	N	
10524 *3*		N	
10539.6 *12*	3^-	N	
10558.5 *20*	2^+	N Q	
10562.1 *9*	3^-	B N	
10568.3 *21*		N	
10582.9 *6*	5^-	N	
10593.3 *21*	2^+	N	
10596 *11*	3^-	B J	
10614 *10*	$1^+,2^+,3^+$	B	Jπ: log *ft*=5.6 from 2^+ parent (^{36}K ε decay).
10615.6 *7*	4^-	N Q	
10617.9 *21*	3^-	N	
10635.7 *5*	1^-	N	
10646.7 *10*		N	
10650.6 *11*	1^-	J N	
10664.1 *21*	$(0^+,1^-,2^+)$	N	
10674.3 *22*	$(3^-,4^+)$	N	
10675.9 *10*	5	N	
10683.9 *10*	1^-	N	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
10700.4 *15*	2^+		N	
10701.7 *12*	$(0^+,1^-,2^+)$		B N Q	
10738.7 *97*			N	
10751.6 *15*			N	
10759.1 *19*	4^+		N	
10760.9 *15*	$(2,3)^-$		N	
10763.8 *22*	4^+		N Q	
10780.0 *22*	4^+		N	
10790.1 *15*	2^+		J N	
10808.9 *12*	$(1^-,2,3^-)$		N	Jπ: γs to 0^+ and 4^+.
10816.0 *29*			N	
10823.4 *15*			N	
10832.3 *15*	$(1^-,3^-,4^+)$		N	
10845.7 *15*			N	
10852.0 *15*	2^+		N	
10853.8 *15*	0^+	<4 fs	N U	
10854 *11*	3^-		B J	
10865 *7*	$(1^-,3^-,4^+)$		N	
10898.6 *15*			N	
10902 *3*	1^-		N	
10906.0 *10*	$(2^+$ to $5^-)$		N	Jπ: γs to 2^+ and 5^-.
10917 *3*			N	
10934 *3*			N	
10939 *3*			N	
10955.7 *12*	$(2^+$ to $5^-)$		N	Jπ: γs to 2^+ and 5^-.
10960.3 *24*	2^+		N	
10968.1 *15*	1,2		B N	Jπ: 1,2,3 from log *ft*=7.2 from 2^+ parent (^{36}K ε decay); 3 less likely from γ to 0^+, g.s.
10976.2 *24*	4^+		N	
10986.0 *15*			N	
10993.5 *24*	$0^+,1^-,2^+$		N	
11000[a]	5^-[@]		K	Jπ: L=5 in ^{32}S(^{6}Li,d).
11014.3 *15*			N	
11027.7 *15*	$(1^-$ to $5^-)$		N	Jπ: γs to 2^+ and 4^+.
11040 *11*	2^+		J	
11043.4 *15*	4^+		N	
11050 *3*	$0^+,1^-,2^+$		N	Jπ: might Be same level as 11056 if $J^\pi=2^+$.
11056 *3*	$1^+,2^+,3^+$		B	Jπ: log *ft*=5.0 from 2^+ parent (^{36}K ε decay); might Be same level as 11050 if $J^\pi=2^+$.
11059.7 *15*	$1^-,3^-$		N	
11086.1 *15*			N	
11091 *3*	$4^+,(5^-)$		N	
11110 *3*	$0^+,1^-,2^+,3^-$		N	
11118.8 *15*			N	
11123.2 *25*	3^-		N	
11131.4 *15*	$1^-,3^-$		N	
11149.4 *15*	$(1,2,3^-)$		N	Jπ: γ to 0^+.
11155.9 *15*	2^+		N	
11167.8 *15*			N Q	
11182.3 *15*	$(3^+$ to $6^-)$		N	Jπ: γs to 3^- and 6^-.
11206.7 *15*			N	
11210 *3*			N	
11215.7 *15*			N	
11224 *3*	$1^-,2^-$		N	
11237.6 *15*	$1^+,2^+,3^+$		B N	Jπ: log *ft*=4.8 from 2^+ (^{36}K ε decay).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
11243 *3*	(1$^-$)		N	
11248 *3*	(1$^+$)		N Q	J$^{\pi}$: from ^{36}Ar(e,e′).
11269.7 *15*			N	
11278 *3*	3$^-$		N	
11303 *3*			N	
11312 *3*	4$^+$,5$^-$		N	
11321.9 *19*			N	
11336.4 *19*	2$^+$		N	
11344 *3*	1$^-$		N	
11358.8 *19*			N Q	
11419.1 *19*			N	
11515? *15*			Q	
11580? *60*	(2$^-$)		Q	
11594? *15*			Q	
11640 *20*	1$^+$,2$^+$,3$^+$		B	J$^{\pi}$: log *ft*=5.0 from 2$^+$ (^{36}K ε decay).
11745? *15*			Q	
11902.1 *9*	10$^+$	0.43 ps *7*	I	J$^{\pi}$,$T_{1/2}$: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
11946? *15*			Q	
12066? *15*			Q	
12090? *70*	(1$^+$)		Q	
12748.5[e] *7*	10$^+$[#]	10.1 fs *23*	I	
12801? *15*			Q	
13201? *15*			Q	
13481? *15*			Q	
13740? *15*			Q	
13800? *15*			Q	
15350.8[e] *8*	12$^+$[#]	14.1 fs *28*	I	
15400[a]	6$^+$[@]		K	J$^{\pi}$: L=6 in ^{32}S(^{6}Li,d).
16800[a]	7$^-$[@]		K	J$^{\pi}$: L=7 in ^{32}S(^{6}Li,d).
18298.6[e] *9*	14$^+$[#]	11.0 fs *25*	I	
19500[a]	8$^+$[@]		K	J$^{\pi}$: L=8 in ^{32}S(^{6}Li,d).
22365.3[e] *15*	16$^+$[#]	<6.0 fs	I	
25300[a]	10$^+$[@]		K	J$^{\pi}$: L=10 in ^{32}S(^{6}Li,d).
27148[&]	2$^+$[&]		H	
27718[&]	4$^+$[&]		H	
29508[&]	6$^+$[&]		H	
30510	8$^+$		H	
31694[&]	7$^-$[&]		H	
32478[&]	8$^+$[&]		H	
34770	13$^-$		H	
37100	15$^-$		H	
39500	16$^+$		H	
x[bc]	(10$^+$)[b]		G	
2200+x[b]	(12$^+$)[b]	0.83 MeV *16*	G	
4900+x[b]	(15$^-$)[b]		G	
5600+x[b]	(15$^-$)[b]		G	
7200+x[b]	(17$^-$)[b]		G	
8300+x[b]	(17$^-$)[b]	0.41 MeV *7*	G	
11500+x[b]	(19$^-$)[b]	2.5 MeV *3*	G	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{36}Ar Levels (continued)

† From ^{35}Cl(p,γ):res, unless noted otherwise.
‡ From ^{35}Cl(p,γ):res from resonance analysis, $\gamma(\theta)$, $\gamma\gamma(\theta)$ and polarization measurements, and RUL. Other arguments may Be given in comments.
# From ^{24}Mg(^{20}Ne,2$\alpha\gamma$) based on $\gamma(\theta)$ which establish stretched E2 for all the in-band and interband linking transitions.
@ From ^{32}S(^{6}Li,d) from d-α angular correlations.
& Possible member of a hyperdeformed structure from ^{24}Mg(^{12}C,α),(^{12}C,^{12}C):fusion. Determined its J^{π} by Regge-pole and phase shift analysis.
[a] Member of a rotational band without parity splitting based on J(J+1) rule, from ^{32}S(^{6}Li,d).
[b] Possible member of a rotational structure populated in ^{20}Ne(^{16}O,^{16}O),(^{16}O,^{12}C) fusion reaction. The J^{π} assignment is from $\sigma(\theta)$ data in above reaction (1996Mi01).
[c] x corresponds to E_R(c.m.)=17.5 MeV in ^{20}Ne(^{16}O,^{16}O) reaction.
[d] Band(A): g.s. band. Band from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
[e] Band(B): SD band. Band from ^{24}Mg(^{20}Ne,2$\alpha\gamma$). β_2=0.46 *3* (2001Sv02). Experimental B(E2)′s are in good agreement with those from shell model calculations of 2001Lo01 for configuration=$(s_{1/2}d_{3/2})^4(pf)^4$.

Adopted Levels, Gammas (continued)

γ(^{36}Ar)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
1970.38	2^+	1970.3	100	0.0	0^+	E2		B(E2)(W.u.)=8.2 *5*
4178.32	3^-	2207.9	100 *1*	1970.38	2^+	E1		B(E1)(W.u.)=2.3×10^{-5} *3*
		4178.1	7.3 *10*	0.0	0^+	[E3]		B(E3)(W.u.)=20.6 *20* (2002Ki06)
4329.1	$(0,1,2)^+$	2358.6	100	1970.38	2^+			
		4328.8	<10	0.0	0^+			
4414.40	4^+	2443.9	100	1970.38	2^+	E2		B(E2)(W.u.)=12.0 *16*
		4414.1	<2	0.0	0^+			
4440.11	2^+	2469.6	56 *3*	1970.38	2^+	M1+E2	>1.5	B(M1)(W.u.)<0.0025; B(E2)(W.u.)>2.3 Mult.,δ: from ^{33}S(α,nγ).
		4439.8	100 *3*	0.0	0^+	E2		B(E2)(W.u.)=0.39 *8* Mult.: from ^{33}S(α,nγ).
4951.4	2^+	537.0	<7	4414.40	4^+			
		773.1	<2.4	4178.32	3^-			
		2980.9	18 *5*	1970.38	2^+			
		4951.0	100 *5*	0.0	0^+			
4974.05	2^-	533.9	<0.3	4440.11	2^+			
		559.6	<0.5	4414.40	4^+			
		795.7	100 *3*	4178.32	3^-	M1+E2	−0.21 *7*	B(M1)(W.u.)=0.0033 *10*; B(E2)(W.u.)=0.8 *6*
		3003.5	5.1 *13*	1970.38	2^+			
		4973.7	23 *3*	0.0	0^+			
5171.13	5^-	197.1	<5	4974.05	2^-			
		219.7	<4	4951.4	2^+			
		731.0	<0.4	4440.11	2^+			
		756.7	14.6 *24*	4414.40	4^+			
		992.8	100 *4*	4178.32	3^-	E2		B(E2)(W.u.)=0.74 *6*
		3200.6	7.3 *12*	1970.38	2^+			
		5170.7	<1.2	0.0	0^+			
5194.4	$(0^+,1^+,2^+,3^-)$	754.3	<3	4440.11	2^+			
		780.0	<3	4414.40	4^+			
		3223.9	100	1970.38	2^+			
		5194.4	<10	0.0	0^+			
5836.0	1^-	664.9	<1	5171.13	5^-			
		861.9	<1	4974.05	2^-			
		884.6	<1	4951.4	2^+			
		1395.9	<1	4440.11	2^+			
		1421.6	<1	4414.40	4^+			
		1506.9	<1	4329.1	$(0,1,2)^+$			
		1657.6	1 *1*	4178.32	3^-			
		3865.4	4.2 *21*	1970.38	2^+			
		5835.5	100.0 *21*	0.0	0^+	E1		B(E1)(W.u.)=0.00047 *16*
5856.65	3^-	x	10.5					Additional information 1.

From ENSDF

$^{36}_{18}Ar_{18}$-9

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
5856.65	3⁻	685.5	<1.3	5171.13	5⁻			
		882.6	<2.6	4974.05	2⁻			
		905.2	<2.6	4951.4	2⁺			
		1416.5	<6.6	4440.11	2⁺			
		1442.2	<5.3	4414.40	4⁺			
		1527.5	<4.0	4329.1	(0,1,2)⁺			
		1678.3	17.1 *13*	4178.32	3⁻	M1+E2	−0.46 *17*	B(M1)(W.u.)=0.0015 *6*; B(E2)(W.u.)=0.4 *3* δ: or +2.9 *9*.
		3886.0	100 *3*	1970.38	2⁺	E1(+M2)	+0.02 *2*	B(E1)(W.u.)=(2.4×10^{-5} *8*); B(M2)(W.u.)=(0.003 *+6−3*)
		5856.7	4.0 *13*	0.0	0⁺			
5895.92	4⁻	724.8	<1.0	5171.13	5⁻			
		921.9	<1.0	4974.05	2⁻			
		1481.5	<3.2	4414.40	4⁺			
		1566.8	<2.1	4329.1	(0,1,2)⁺			
		1717.6	100 *2*	4178.32	3⁻	M1+E2	+0.16 *2*	B(M1)(W.u.)=0.011 *5*; B(E2)(W.u.)=0.35 *17*
		3925.3	6.4 *21*	1970.38	2⁺			
		5895.4	<3.2	0.0	0⁺			
6136.5	4⁺	1186.0 *3*	27.7 *10*	4951.4	2⁺			E_γ,I_γ: from ^{24}Mg(^{20}Ne,2αγ).
		1696.7 *4*	8.6 *6*	4440.11	2⁺			E_γ,I_γ: from ^{24}Mg(^{20}Ne,2αγ).
		4165.6 *10*	100 *12*	1970.38	2⁺	E2		E_γ,I_γ,Mult.: from ^{24}Mg(^{20}Ne,2αγ).
6217.3	5⁻	x	15.6					Additional information 2.
		360.7	<3.9	5856.65	3⁻			
		381.3	<3.9	5836.0	1⁻			
		1046.2	2.6 *7*	5171.13	5⁻			
		1243.2	<1.3	4974.05	2⁻			
		1265.9	<2.6	4951.4	2⁺			
		1777.1	<1.3	4440.11	2⁺			
		1802.9	12 *4*	4414.40	4⁺	E1		B(E1)(W.u.)=4.5×10^{-5} *17*
		1888.1	<2.6	4329.1	(0,1,2)⁺			
		2038.9	100 *5*	4178.32	3⁻	E2		B(E2)(W.u.)=8.0 *16*
		4246.7	<2.6	1970.38	2⁺			
		6216.7	<2.6	0.0	0⁺			
6356.0	4⁺	1404.6	<12.5	4951.4	2⁺			
		1915.8	31 *4*	4440.11	2⁺			
		1941.5	77 *4*	4414.40	4⁺			
		4385.3	100 *4*	1970.38	2⁺	E2		B(E2)(W.u.)=0.07 *3*
		6355.4	<14.6	0.0	0⁺			
6611.0	2⁺	754.3	<2.4	5856.65	3⁻			
		775.0	<1.2	5836.0	1⁻			
		1439.8	<6.1	5171.13	5⁻			
		1660	<6.1	4951.4	2⁺			

From ENSDF

$^{36}_{18}Ar_{18}$-10

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
6611.0	2^+	2170.8	<7.3	4440.11	2^+			
		2196.5	<6.1	4414.40	4^+			
		2281.8	<7.3	4329.1	$(0,1,2)^+$			
		2432.6	100 *4*	4178.32	3^-			
		4640.3	<6.1	1970.38	2^+			
		6610.3	22 *4*	0.0	0^+			
6645.6	$(2^+,3^+,4^+)$	2205.4	100	4440.11	2^+			
6724	NOT $(2)^+$	x	43					Additional information 3.
		6723	100 *14*	0.0	0^+			
6731.0	$1^+,2^+$	4759.6 *7*	100 *18*	1970.38	2^+			
		6730.5 *5*	100 *16*	0.0	0^+			
6835.16	4^-	978.5	12 *10*	5856.65	3^-			
		1664.0	97 *8*	5171.13	5^-	M1+E2	+0.7 *3*	B(M1)(W.u.)=0.0020 *9*; B(E2)(W.u.)=1.3 *9* δ: or +1.5 *+40−4*.
		1861.1	100 *8*	4974.05	2^-			
		1883.7	<5.2	4951.4	2^+			
		2395.0	12 *3*	4440.11	2^+			
		2506.0	<5.4	4329.1	$(0,1,2)^+$			
		2656.7	49 *5*	4178.32	3^-	M1+E2	+0.32 *8*	B(M1)(W.u.)=0.00034 *12*; B(E2)(W.u.)=0.018 *10* δ: or >+4.
		4864.4	<5.4	1970.38	2^+			
		6834.5	<2.7	0.0	0^+			
6836.50	3^-	1665.3	46 *4*	5171.13	5^-	E2		B(E2)(W.u.)=9 *3*
		1862.4	19 *7*	4974.05	2^-			
		1885.1	6.1 *9*	4951.4	2^+			
		2396.3	4.4 *18*	4440.11	2^+			
		2425	<3.5	4414.40	4^+			
		2658.7	100 *7*	4178.32	3^-	M1+E2	−1.9 *5*	B(M1)(W.u.)=0.0008 *5*; B(E2)(W.u.)=1.6 *5* δ: or +1.5 *+40−4*.
		4865.8	<8.8	1970.38	2^+			
		6835.8	<1.8	0.0	0^+			
6866.9	$(1^+,2^+)$	4896.2	100 *7*	1970.38	2^+			
		6866.2	33 *7*	0.0	0^+			
7136.5	$(1^-,2^+)$	1300.5	<1.3	5836.0	1^-			
		2162.4	<2.5	4974.05	2^-			
		2696.3	<3.8	4440.11	2^+			
		2722.0	<2.5	4414.40	4^+			
		2958.0	<5.1	4178.32	3^-			
		5165.7	26.6 *25*	1970.38	2^+			
		7135.7	100.0 *25*	0.0	0^+			
7139.6	3^+	1282.9	<3.8	5856.65	3^-			
		1303.6	<3.8	5836.0	1^-			

From ENSDF

$^{36}_{18}Ar_{18}$-11

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
7139.6	3^+	2699.4	100 *9*	4440.11	2^+	M1+E2	−0.28 *3*	B(M1)(W.u.)=0.008 *4*; B(E2)(W.u.)=0.29 *17* δ: or −1.5 *2* (1973Ho33).
		2725.1	<5.7	4414.40	4^+			
		2961.1	<5.7	4178.32	3^-			
		5168.8	89 *9*	1970.38	2^+			
		7138.8	<3.8	0.0	0^+			
7178.9	$(1,2)^+$	5208.1	49 *15*	1970.38	2^+			
		7178.1	100 *16*	0.0	0^+			
7247.4	$(1,2,3)^-$	3068.9	<5	4178.32	3^-			
		5276.6	100	1970.38	2^+			
		7246.6	<6	0.0	0^+			
7258.6	3^-	x	11					Additional information 4.
		3080.1	<13.3	4178.32	3^-			
		5287.8	100 *6*	1970.38	2^+	E1		B(E1)(W.u.)>0.00024
		7257.8	<16.7	0.0	0^+			
7336.6	3^+	1479.9	<7.4	5856.65	3^-			
		2362.5	<5.6	4974.05	2^-			
		2385.1	<9.3	4951.4	2^+			
		2896.4	100 *4*	4440.11	2^+			
		2922.1	20 *4*	4414.40	4^+	M1(+E2)	+0.02 *7*	B(M1)(W.u.)=(0.009 *5*); B(E2)(W.u.)=(0.0015 *+103−15*) δ: or −4.0 *9*.
		3007.4	<13	4329.1	$(0,1,2)^+$			
		3158.1	17 *4*	4178.32	3^-			
		5365.8	48 *6*	1970.38	2^+	M1+E2	+0.31 *10*	B(M1)(W.u.)=0.0030 *16*; B(E2)(W.u.)=0.04 *3* δ: or >+7.
		7335.8	<5.6	0.0	0^+			
7353.9	6^-	1497.2	<6	5856.65	3^-			
		1517.9	<4	5836.0	1^-			
		2182.7	100	5171.13	5^-	M1+E2	−6.0 *9*	B(M1)(W.u.)=0.00037 *14*; B(E2)(W.u.)=10.2 *24*
		2379.8	<4	4974.05	2^-			
		2402.4	<4	4951.4	2^+			
		2913.7	<3	4440.11	2^+			
		2939.4	<4	4414.40	4^+			
		3024.7	<8	4329.1	$(0,1,2)^+$			
		3175.4	<7	4178.32	3^-			
		5383.1	<5	1970.38	2^+			
		7353.1	<3	0.0	0^+			
7432.3	1^+	5461.5	54 *23*	1970.38	2^+			
		7431.5	100 *23*	0.0	0^+			
7573.1	4^-	1677.1	10.6 *21*	5895.92	4^-			
		1737.1	<4.3	5836.0	1^-			

From ENSDF

$^{36}_{18}Ar_{18}$-12

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
7573.1	4⁻	2401.9	100 *4*	5171.13	5⁻	M1+E2	−0.49 *4*	B(M1)(W.u.)=0.0036 *12*; B(E2)(W.u.)=0.55 *19* δ: or −1.68 *12*.
		2598.9	17.0 *21*	4974.05	2⁻	E2		B(E2)(W.u.)=0.33 *11*
		2621.6	<2.1	4951.4	2⁺			
		3132.8	<4.3	4440.11	2⁺			
		3158.6	11 *4*	4414.40	4⁺			
		3243.8	<4.3	4329.1	(0,1,2)⁺			
		3394.6	70 *6*	4178.32	3⁻	M1+E2	−0.07 *4*	B(M1)(W.u.)=0.0011 *4*; B(E2)(W.u.)=0.0017 *+21−17* δ: or −3.2 *5*.
		5602.3	4.3 *9*	1970.38	2⁺			
		7572.2	<2.1	0.0	0⁺			
7672.1	(3)⁻	2697.9	25 *9*	4974.05	2⁻			
		5701.2	100 *9*	1970.38	2⁺			
7710.3	1⁺	5739.4	100 *11*	1970.38	2⁺			
		7709.4	59 *11*	0.0	0⁺			
7749.7	2⁻	5778.8	100	1970.38	2⁺			
7767.0	6⁺	1629.8 *3*	100.0 *17*	6136.5	4⁺			E_γ,I_γ: from ^{24}Mg(^{20}Ne,2αγ).
		3352.5 *8*	42.9 *17*	4414.40	4⁺	E2		B(E2)(W.u.)=0.75 *12* E_γ,I_γ,Mult.: from ^{24}Mg(^{20}Ne,2αγ).
7879	(1,2)⁻	2043	100 *10*	5836.0	1⁻			
		2905	67 *10*	4974.05	2⁻			
7971.4	1⁺,2⁺	7970.5 *7*	100	0.0	0⁺			
8015.9	(3,4)⁻	2159.2	51 *7*	5856.65	3⁻			
		2844.6	40 *4*	5171.13	5⁻			
		3041.7	100 *9*	4974.05	2⁻			
		3575.6	<4.4	4440.11	2⁺			
		3601.3	4.4 *10*	4414.40	4⁺			
		3837.4	27 *4*	4178.32	3⁻			
		6045.0	<6.7	1970.38	2⁺			
		8014.9	<2.2	0.0	0⁺			
8131.9	1⁺	6161.0	67 *12*	1970.38	2⁺			
		8130.9	100 *12*	0.0	0⁺			
8288		2392	100	5895.92	4⁻			
8332.5	(3)⁻	x	100					Additional information 5.
		4153.9	43 *7*	4178.32	3⁻			
8472.0	(3⁻,4⁻,5⁻)	2254.6	13 *3*	6217.3	5⁻			
		2576.0	41 *6*	5895.92	4⁻			
		2615.2	66 *6*	5856.65	3⁻			
		2635.9	<6.3	5836.0	1⁻			
		3300.7	100 *6*	5171.13	5⁻			
		3497.8	<6.3	4974.05	2⁻			

From ENSDF

$^{36}_{18}Ar_{18}$-13

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	Comments
8472.0	(3⁻,4⁻,5⁻)	3520.4	<6.3	4951.4	2⁺		
		4057.4	88 *6*	4414.40	4⁺		
		4293.4	6.3 *19*	4178.32	3⁻		
		6501.0	<3.1	1970.38	2⁺		
		8470.9	<3.1	0.0	0⁺		
8556.3	2⁺	6585.1 *5*	100	1970.38	2⁺		E_γ,I_γ: from ^{36}K ε decay.
8593		2376	100	6217.3	5⁻		E_γ,I_γ: from ^{33}S(α,nγ).
8739		3568	100	5171.13	5⁻		E_γ,I_γ: from ^{33}S(α,nγ).
8806.4	(0⁻,1,2,3⁻)	6835.3	100	1970.38	2⁺		
8909.1	2⁺	6938.0	100 *16*	1970.38	2⁺		E_γ,I_γ: from ^{32}S(α,γ):res.
		8907.9	61 *10*	0.0	0⁺	E2	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
8921.6		3748	100	5171.13	5⁻		E_γ: from ^{33}S(α,nγ).
8938.8	(2⁺,3,4⁻)	1266.7	7.6 *4*	7672.1	(3)⁻		
		2102.2	15 *5*	6836.50	3⁻		
		3082.0	57 *8*	5856.65	3⁻		
		3964.5	5.9 *25*	4974.05	2⁻		
		4524.1	20 *6*	4414.40	4⁺		
		4609.4	<2.1	4329.1	(0,1,2)⁺		
		4760.1	100 *10*	4178.32	3⁻		
		6967.7	5.1 *21*	1970.38	2⁺		
		8937.6	<0.4	0.0	0⁺		
9014.9	(3⁻,4,5⁻)	3843.5	100	5171.13	5⁻		
		4600.2	<5	4414.40	4⁺		
		4685.5	<8	4329.1	(0,1,2)⁺		
		4836.2	<3	4178.32	3⁻		
		7043.8	<6	1970.38	2⁺		
		9013.7	<1.4	0.0	0⁺		
9024.8	2	2158.3	1	6866.9	(1⁺,2⁺)		
		4051.6	1	4974.05	2⁻		
		4610.6	<1	4414.40	4⁺		
		4695.9	<1	4329.1	(0,1,2)⁺		
		4846.6	8	4178.32	3⁻		
		7054.2	100	1970.38	2⁺		
		9024.1	1	0.0	0⁺		
9066.4	3⁻	1729.8	11	7336.6	3⁺		
		2229.8	43	6836.50	3⁻		
		3170.3	11	5895.92	4⁻		
		3209.6	100	5856.65	3⁻		
		3895.0	4	5171.13	5⁻		
		4092.1	18	4974.05	2⁻		
		4114.7	11	4951.4	2⁺		

From ENSDF

$^{36}_{18}Ar_{18}$-14

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
9066.4	3^-	4626.0	29	4440.11	2^+		
		4651.7	207 *19*	4414.40	4^+		
		4737.0	<4	4329.1	$(0,1,2)^+$		
		4887.7	82	4178.32	3^-		
		7095.3	<4	1970.38	2^+		
		9065.2	<1	0.0	0^+		
9117.0	1^-	9116.8	100	0.0	0^+	E1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
9132.5	3^-	2295.9	13	6836.50	3^-		
		2521.4	4	6611.0	2^+		
		3236.4	7	5895.92	4^-		
		3275.5	17	5856.65	3^-		
		3296.3	2	5836.0	1^-		
		4158.2	9	4974.05	2^-		
		4717.8	4	4414.40	4^+		
		4803.1	<2	4329.1	$(0,1,2)^+$		
		4953.8	28	4178.32	3^-		
		7161.4	100	1970.38	2^+		
		9131.3	2	0.0	0^+		
9144.9	$(2^+,3^-)$	2308.3	6	6836.50	3^-		
		3308.7	22	5836.0	1^-		
		4170.6	3	4974.05	2^-		
		4704.5	97	4440.11	2^+		
		4730.2	6	4414.40	4^+		
		4815.5	<3	4329.1	$(0,1,2)^+$		
		4966.2	75	4178.32	3^-		
		7173.8	100	1970.38	2^+		
		9143.7	3	0.0	0^+		
9186	(6^+)	4015	100 *20*	5171.13	5^-		E_γ,I_γ: from ^{33}S(α,nγ).
		4771	100 *20*	4414.40	4^+		E_γ,I_γ: from ^{33}S(α,nγ).
9192.1	$(3^-,4^+)$	1520.0	11	7672.1	$(3)^-$		
		1855.4	100	7336.6	3^+		
		2355.5	53	6836.50	3^-		
		2468.0	26	6724	NOT $(2)^+$		
		2836.0	11	6356.0	4^+		
		2974.7	21	6217.3	5^-		
		3055.5	11	6136.5	4^+		
		3296.0	26	5895.92	4^-		
		3335.3	21	5856.65	3^-		
		4020.7	47	5171.13	5^-		
		4240.4	42	4951.4	2^+		
		4751.5	16	4440.11	2^+		

From ENSDF

$^{36}_{18}Ar_{18}$-15

Adopted Levels, Gammas (continued)

$\gamma(^{36}Ar)$ (continued)

E_i(level)	J^{π}_i	E_γ†	I_γ†	E_f	J^{π}_f
9192.1	$(3^-,4^+)$	4777.4	100	4414.40	4^+
		4862.6	<5	4329.1	$(0,1,2)^+$
		5013.4	42	4178.32	3^-
		7220.9	<11	1970.38	2^+
		9190.8	<16	0.0	0^+
9220.2	1^+	3384.0	2	5836.0	1^-
		4245.9	6	4974.05	2^-
		4268.5	2	4951.4	2^+
		4779.7	22	4440.11	2^+
		4805.5	<2	4414.40	4^+
		4890.7	1	4329.1	$(0,1,2)^+$
		5041.5	<2	4178.32	3^-
		7249.0	100	1970.38	2^+
		9218.9	68	0.0	0^+
9240.5	2^-	1993.0	13	7247.4	$(1,2,3)^-$
		2103.9	11	7136.5	$(1^-,2^+)$
		2373.5	5	6866.9	$(1^+,2^+)$
		3404.3	14	5836.0	1^-
		4266.2	11	4974.05	2^-
		4288.8	14	4951.4	2^+
		4825.8	<2	4414.40	4^+
		4911.0	7	4329.1	$(0,1,2)^+$
		5061.8	4	4178.32	3^-
		7269.3	100	1970.38	2^+
		9239.2	<1	0.0	0^+
9248.4	$(1^-,2^-,3^-)$	2411.8	48	6836.50	3^-
		3391.6	12	5856.65	3^-
		3412.2	9	5836.0	1^-
		4274.1	9	4974.05	2^-
		4807.9	100	4440.11	2^+
		4833.7	<3	4414.40	4^+
		4918.9	<6	4329.1	$(0,1,2)^+$
		5069.7	33	4178.32	3^-
		7277.2	88	1970.38	2^+
		9247.1	3	0.0	0^+
9258.3	3^-	2423.1	11	6835.16	4^-
		2902.2	8	6356.0	4^+
		3362.2	19	5895.92	4^-
		3401.5	8	5856.65	3^-
		3422.1	6	5836.0	1^-
		4284.0	8	4974.05	2^-
		4306.6	6	4951.4	2^+

From ENSDF

$^{36}_{18}Ar_{18}$-16

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]
9258.3	3⁻	4817.8	61	4440.11	2⁺		
		4843.6	33	4414.40	4⁺		
		4928.8	<3	4329.1	(0,1,2)⁺		
		5079.6	100	4178.32	3⁻		
		7287.1	17	1970.38	2⁺		
		9257.0	<3	0.0	0⁺		
9300.1	4⁻	1628.0	1	7672.1	(3)⁻		
		2041.4	6	7258.6	3⁻		
		2464.8	100	6835.16	4⁻	M1(+E2)	0.0 *2*
		3082.7	9	6217.3	5⁻		
		3404.0	28	5895.92	4⁻	M1(+E2)	−0.12 *17*
		3443.3	11	5856.65	3⁻	M1(+E2)	−0.01 *7*
		4128.7	30	5171.13	5⁻	M1(+E2)	+0.05 *+8−3*
		4885.3	13	4414.40	4⁺	E1(+M2)	−0.1 *2*
		5121.4	15	4178.32	3⁻	M1(+E2)	+0.02 *6*
		7328.9	1	1970.38	2⁺		
9342.5	3⁻	1769.4	2	7573.1	4⁻		
		2505.9	20	6836.50	3⁻	M1+E2	+0.09 *4*
		3446.4	8	5895.92	4⁻	M1(+E2)	−0.02 *3*
		3485	10	5856.65	3⁻	M1+E2	+0.10 *7*
		4368.2	19	4974.05	2⁻	M1+E2	−0.10 *2*
		4927.7	2	4414.40	4⁺		
		5013.0	<5	4329.1	(0,1,2)⁺		
		5163.8	100	4178.32	3⁻	M1(+E2)	+0.017 *17*
		7371.3	8	1970.38	2⁺	E1+M2	+0.11 *3*
		9341.2	<1	0.0	0⁺		
9356.0	2⁺	2019.3	9	7336.6	3⁺		
		4381.7	7	4974.05	2⁻		
		4404.3	10	4951.4	2⁺		
		4941.2	<3	4414.40	4⁺		
		5026.5	<3	4329.1	(0,1,2)⁺		
		5177.3	9	4178.32	3⁻		
		7384.8	12	1970.38	2⁺		
		9354.7	100	0.0	0⁺		
9365.9	1⁻	1486.9	3	7879	(1,2)⁻		
		2108.5	12	7258.6	3⁻		
		2229.3	21	7136.5	(1⁻,2⁺)		
		2754.8	25	6611.0	2⁺		
		3529.7	13	5836.0	1⁻		
		4171.2	1	5194.4	(0⁺,1⁺,2⁺,3⁻)		
		4414.2	2	4951.4	2⁺		
		4925.4	8	4440.11	2⁺		

From ENSDF

$^{36}_{18}Ar_{18}$-17

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Comments
9365.9	1⁻	5036.4	2	4329.1	(0,1,2)⁺	
		5187.2	<2	4178.32	3⁻	
		7394.7	100	1970.38	2⁺	
		9364.6	13	0.0	0⁺	
9374.1	(1⁻,2⁻,3⁻)	2538.8	2	6835.16	4⁻	
		3537.9	3	5836.0	1⁻	
		4399.8	1	4974.05	2⁻	
		4933.6	1	4440.11	2⁺	
		4959.3	<1	4414.40	4⁺	
		5044.6	<1	4329.1	(0,1,2)⁺	
		5195.4	6	4178.32	3⁻	
		7402.9	100	1970.38	2⁺	
		9372.8	1	0.0	0⁺	
9379.9	(2⁺,3⁺,4⁺)	2240.2	3	7139.6	3⁺	
		2543.3	1	6836.50	3⁻	
		4939.4	31	4440.11	2⁺	
		4965.1	15	4414.40	4⁺	
		5050.4	<2	4329.1	(0,1,2)⁺	
		5201.2	3	4178.32	3⁻	
		7408.7	100	1970.38	2⁺	
		9378.6	<0.2	0.0	0⁺	
9393.4	(2⁺,3⁺,4⁺)	4441.7	3	4951.4	2⁺	
		4952.9	3	4440.11	2⁺	
		4978.6	5	4414.40	4⁺	
		5063.9	<1	4329.1	(0,1,2)⁺	
		5214.7	3	4178.32	3⁻	
		7422.2	100	1970.38	2⁺	
		9392.1	<1	0.0	0⁺	
9413.9		2060		7353.9	6⁻	E_γ: from ^{33}S(α,nγ).
9439.2	(2⁺,3⁺,4⁺)	4998.7	28	4440.11	2⁺	
		5024.4	21	4414.40	4⁺	
		5109.7	<4	4329.1	(0,1,2)⁺	
		5260.5	<6	4178.32	3⁻	
		7468.0	100	1970.38	2⁺	
		9437.9	<2	0.0	0⁺	
9448.1	1⁻,2⁺,3⁻	2611.5	13	6836.50	3⁻	
		4473.8	11	4974.05	2⁻	
		5033.3	6	4414.40	4⁺	
		5118.6	<4	4329.1	(0,1,2)⁺	
		5269.4	58	4178.32	3⁻	
		7476.9	100	1970.38	2⁺	
		9446.8	<2	0.0	0⁺	

From ENSDF

$^{36}_{18}Ar_{18}$-18

Adopted Levels, Gammas (continued)

$\gamma(^{36}Ar)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π
9465.9	$1^-,2^+$	1755.6	2	7710.3	1^+
		5025.4	3	4440.11	2^+
		5051.1	2	4414.40	4^+
		5136.4	6	4329.1	$(0,1,2)^+$
		5287.2	4	4178.32	3^-
		7494.7	100	1970.38	2^+
		9464.6	86	0.0	0^+
9474.0	(1,2)	1342.1	22	8131.9	1^+
		1763.7	27	7710.3	1^+
		4522.3	16	4951.4	2^+
		5033.5	81	4440.11	2^+
		5059.2	<5	4414.40	4^+
		5144.5	<11	4329.1	$(0,1,2)^+$
		5295.3	<8	4178.32	3^-
		7502.8	29	1970.38	2^+
		9472.7	100	0.0	0^+
9502.8	(2,3)	2166.1	14	7336.6	3^+
		2891.7	28	6611.0	2^+
		5062.3	25	4440.11	2^+
		5088.0	7	4414.40	4^+
		5173.3	<2	4329.1	$(0,1,2)^+$
		5324.1	<2	4178.32	3^-
		7531.6	100	1970.38	2^+
		9501.5	2	0.0	0^+
9509.6	$(2^+,3^+,4^+)$	5069.1	3	4440.11	2^+
		5094.8	5	4414.40	4^+
		5180.1	<2	4329.1	$(0,1,2)^+$
		5330.9	<3	4178.32	3^-
		7538.4	100	1970.38	2^+
		9508.3	<0.5	0.0	0^+
9542.0	$(1,2,3)^-$	2705.4	44	6836.50	3^-
		3705.8	16	5836.0	1^-
		4590.3	16	4951.4	2^+
		5101.5	22	4440.11	2^+
		5127.2	<2	4414.40	4^+
		5212.5	<4	4329.1	$(0,1,2)^+$
		5363.3	24	4178.32	3^-
		7570.8	100	1970.38	2^+
		9540.6	<1.	0.0	0^+
9550.3	(0^+ to 4^+)	4575.9	1	4974.05	2^-
		5109.8	21	4440.11	2^+
		5135.5	<0.4	4414.40	4^+

$^{36}_{18}Ar_{18}$-19

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]
9550.3	$(0^+$ to $4^+)$	5220.8	<0.4	4329.1	$(0,1,2)^+$		
		5371.5	<1	4178.32	3^-		
		7579.1	100	1970.38	2^+		
		9548.9	<0.1	0.0	0^+		
9574.3	4^-	1558.4	2	8015.9	$(3,4)^-$		
		2001.1	36	7573.1	4^-	M1+E2	−0.08 *3*
		3356.8	4	6217.3	5^-	M1+E2	+0.03 *6*
		3678	28	5895.92	4^-	M1+E2	−0.06 *4*
		3717.4	6	5856.65	3^-	M1+E2	+0.05 *3*
		4402.9	100	5171.13	5^-	M1+E2	+0.05 *1*
		5159.6	<2	4414.40	4^+		
		5244.8	<2	4329.1	$(0,1,2)^+$		
		5395.5	24	4178.32	3^-	M1+E2	−0.03 *1*
		7603.1	<2	1970.38	2^+		
		9572.9	<0.2	0.0	0^+		
9595.4	2^+	2347.9	4	7247.4	$(1,2,3)^-$		
		2458.8	16	7136.5	$(1^-,2^+)$		
		3759.2	14	5836.0	1^-		
		4400.7	4	5194.4	$(0^+,1^+,2^+,3^-)$		
		5154.9	7	4440.11	2^+		
		5180.6	<2	4414.40	4^+		
		5265.9	<2	4329.1	$(0,1,2)^+$		
		5416.6	<4	4178.32	3^-		
		7624.2	100	1970.38	2^+		
		9594.0	34	0.0	0^+		
9606.8	$(0,1,2)^-$	1896.4	6	7710.3	1^+		
		3770.6	100	5836.0	1^-		
		5192.0	<3	4414.40	4^+		
		5277.3	<2	4329.1	$(0,1,2)^+$		
		5428.0	<2	4178.32	3^-		
		7635.6	<2	1970.38	2^+		
		9605.4	<0.5	0.0	0^+		
9667.1	3^-	3771.0	8	5895.92	4^-		
		4495.7	5	5171.13	5^-		
		5226.6	13	4440.11	2^+		
		5252.3	16	4414.40	4^+		
		5337.6	<3	4329.1	$(0,1,2)^+$		
		5488.3	17	4178.32	3^-		
		7695.8	100	1970.38	2^+		
		9665.7	<2	0.0	0^+		
9681.9	$4^+,6^+$	5267.1	100	4414.40	4^+	E2,M1+E2	
		5352.4	<2	4329.1	$(0,1,2)^+$		

From ENSDF

$^{36}_{18}Ar_{18}$-20

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]
9681.9	$4^+,6^+$	5503.1	<3	4178.32	3^-		
		7710.6	<1	1970.38	2^+		
9734.3	$1^-,3^-,4^+$	3123.2		6611.0	2^+		
		5555.5		4178.32	3^-		
9737.5	3^-	1987.7	5	7749.7	2^-		
		2065.3	16	7672.1	$(3)^-$		
		2490.0	47	7247.4	$(1,2,3)^-$		
		2600.9	42	7136.5	$(1^-,2^+)$		
		2870.5	5	6866.9	$(1^+,2^+)$		
		2900.9	100	6836.50	3^-		
		3126.4	21	6611.0	2^+		
		3880.6	42	5856.65	3^-		
		3901.3	53	5836.0	1^-		
		4763.1	26	4974.05	2^-		
		4785.8	4	4951.4	2^+		
		5297.0	84	4440.11	2^+		
		5322.7	<5	4414.40	4^+		
		5408.0	<5	4329.1	$(0,1,2)^+$		
		5558.7	11	4178.32	3^-		
		7766.2	68	1970.38	2^+		
		9736.1	1	0.0	0^+		
9764.5	$(3^-,4^-,5^-)$	2505.8	5	7258.6	3^-		
		2927.9	49	6836.50	3^-		
		3907.6	11	5856.65	3^-		
		4593.1	100	5171.13	5^-		
		5349.7	95	4414.40	4^+		
		5435.0	<5	4329.1	$(0,1,2)^+$		
		5585.7	22	4178.32	3^-		
		7793.2	<3	1970.38	2^+		
9812.2	$(1,2,3^-)$	5371.7	100	4440.11	2^+		
		5397.4	<6	4414.40	4^+		
		5482.7	47	4329.1	$(0,1,2)^+$		
		5633.4	24	4178.32	3^-		
		7840.9	79	1970.38	2^+		
		9810.8	44	0.0	0^+		
9862.6	3^+	2525.9	100	7336.6	3^+	M1(+E2)	−0.07 *10*
		3251.4	24	6611.0	2^+		
		5422.1	94	4440.11	2^+	(M1+)E2	
		5447.8	<9	4414.40	4^+		
		5533.0	<9	4329.1	$(0,1,2)^+$		
		5683.8	24	4178.32	3^-	E1(+M2)	+1.0 *+16−7*
		7891.3	58	1970.38	2^+	M1+E2	>+8

From ENSDF

$^{36}_{18}Ar_{18}$-21

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
9862.6	3^+	9861.1	3	0.0	0^+		
9878.6	$2^+,3^+$	2541.9	56	7336.6	3^+		
		3267.4	100	6611.0	2^+		
		4021.9	8	5856.65	3^-		
		5438.0	75	4440.11	2^+		
		5463.8	31	4414.40	4^+		
		5549.0	<1	4329.1	$(0,1,2)^+$		
		5699.8	8	4178.32	3^-		
		7907.3	<3	1970.38	2^+		
		9877.1	<1	0.0	0^+		
9889.3		2641.8	2	7247.4	$(1,2,3)^-$		
		3278.1	2	6611.0	2^+		
		3993.1	3	5895.92	4^-		
		4032.4	3	5856.65	3^-		
		4053.1	5	5836.0	1^-		
		4937.5	5	4951.4	2^+		
		5448.7	17	4440.11	2^+		
		5474.5	<2	4414.40	4^+		
		5559.7	<2	4329.1	$(0,1,2)^+$		
		5710.5	17	4178.32	3^-		
		7918.0	100	1970.38	2^+		
		9887.8	2	0.0	0^+		
9902.1	4^+	2229.9	8	7672.1	$(3)^-$		
		2565.4	14	7336.6	3^+		
		3065.5	30	6836.50	3^-		
		3684.6	5	6217.3	5^-		
		4730.6	16	5171.13	5^-		
		4950.3	24	4951.4	2^+		
		5461.5	19	4440.11	2^+		
		5487.3	8	4414.40	4^+		
		5572.5	<3	4329.1	$(0,1,2)^+$		
		5723.3	50	4178.32	3^-		
		7930.8	100	1970.38	2^+		
9927.0	8^+	2160.0 *3*	100	7767.0	6^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2αγ).
9927.4	5^-	2668.7	8	7258.6	3^-		
		3090.8	10	6836.50	3^-		
		3709.9	2	6217.3	5^-		
		3790.7	5	6136.5	4^+	E1	
		4031.2	3	5895.92	4^-		
		4070.5	16	5856.65	3^-	E2	
		4755.9	15	5171.13	5^-		
		5511.5	100	4414.40	4^+	E1	

From ENSDF

$^{36}_{18}Ar_{18}$-22

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π
9927.4	5^-	5597.8	<2	4329.1	$(0,1,2)^+$
		5748.6	3	4178.32	3^-
		7956.1	<2	1970.38	2^+
9942.5	$(2,3^-)$	2605.8	5	7336.6	3^+
		2695.0	7	7247.4	$(1,2,3)^-$
		2805.9	4	7136.5	$(1^-,2^+)$
		3105.9	2	6836.50	3^-
		3331.3	36	6611.0	2^+
		4106.2	5	5836.0	1^-
		4968.1	11	4974.05	2^-
		4990.7	2	4951.4	2^+
		5501.9	5	4440.11	2^+
		5527.6	<2	4414.40	4^+
		5612.9	<2	4329.1	$(0,1,2)^+$
		5763.7	2	4178.32	3^-
		7971.5	100	1970.38	2^+
		9941.5	2	0.0	0^+
9956.9	$(1,2^+)$	2709.4	0.3	7247.4	$(1,2,3)^-$
		4120.6	2	5836.0	1^-
		4762.2	2	5194.4	$(0^+,1^+,2^+,3^-)$
		4982.5	3	4974.05	2^-
		5516.3	5	4440.11	2^+
		5542.0	<0.2	4414.40	4^+
		5627.3	0.2	4329.1	$(0,1,2)^+$
		5778.1	<0.5	4178.32	3^-
		7985.6	1	1970.38	2^+
		9955.4	100	0.0	0^+
9983.2	$1^+,(2^+)$	2735.7	0.6	7247.4	$(1,2,3)^-$
		4146.9	1	5836.0	1^-
		4788.5	2	5194.4	$(0^+,1^+,2^+,3^-)$
		5008.8	2	4974.05	2^-
		5542.6	6	4440.11	2^+
		5568.3	<0.1	4414.40	4^+
		5653.6	0.6	4329.1	$(0,1,2)^+$
		8011.9	4	1970.38	2^+
		9981.7	100	0.0	0^+
9992.9		1860.9	8	8131.9	1^+
		2419.7	5	7573.1	4^-
		3157.6	8	6835.16	4^-
		3775.4	10	6217.3	5^-
		4096.7	26	5895.92	4^-
		4136.0	3	5856.65	3^-
9992.9		4821.4	54	5171.13	5^-
		5018.5	5	4974.05	2^-
		5578.0	23	4414.40	4^+
		5663.3	<5	4329.1	$(0,1,2)^+$
		5814.1	100	4178.32	3^-
		8021.6	15	1970.38	2^+
10002.4	$(1^-,2,3)$	3391.2	16	6611.0	2^+
		5028.0	37	4974.05	2^-
		5561.8	25	4440.11	2^+
		5587.5	<8	4414.40	4^+
		5672.8	<8	4329.1	$(0,1,2)^+$
		5823.6	100	4178.32	3^-
		8031.6	<10	1970.38	2^+
		10000.9	18	0.0	0^+
10044.4	1^-	5629.5	<1	4414.40	4^+
		5714.8	<1	4329.1	$(0,1,2)^+$
		5865.6	<1	4178.32	3^-
		8073.1	<1	1970.38	2^+
		10042.9	100	0.0	0^+
10050.6	2^+	5610.0	11	4440.11	2^+
		5635.7	11	4414.40	4^+
		5871.8	63	4178.32	3^-
		8079.3	<7	1970.38	2^+
		10049.1	100	0.0	0^+
10076.7	$(1^-,2,3)$	5102.3	13	4974.05	2^-
		5636.1	19	4440.11	2^+
		5661.8	<4	4414.40	4^+
		5747.1	<4	4329.1	$(0,1,2)^+$
		5897.9	100	4178.32	3^-
		8105.3	56	1970.38	2^+
		10075.2	4	0.0	0^+
10094.9	2^+	2384.5	20	7710.3	1^+
		2758.2	20	7336.6	3^+
		4900.1	8	5194.4	$(0^+,1^+,2^+,3^-)$
		5120.5	6	4974.05	2^-
		5654.3	8	4440.11	2^+
		5680.0	<4	4414.40	4^+
		5765.3	2	4329.1	$(0,1,2)^+$
		5916.1	24	4178.32	3^-
		8123.5	12	1970.38	2^+
		10093.4	100	0.0	0^+
10099.4	1^-	3488.2	9	6611.0	2^+

From ENSDF

$^{36}_{18}Ar_{18}$-23

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
10099.4	1^-	5124.0	1	4974.05	2^-
		5658.8	7	4440.11	2^+
		5684.5	<1	4414.40	4^+
		5769.8	1	4329.1	$(0,1,2)^+$
		5920.6	<2	4178.32	3^-
		8128.0	4	1970.38	2^+
		10097.9	100	0.0	0^+
10139.5	$(2^+,3^-)$	2802.8	6	7336.6	3^+
		5187.7	17	4951.4	2^+
		5724.6	62	4414.40	4^+
		5809.9	<4	4329.1	$(0,1,2)^+$
		5960.7	100	4178.32	3^-
		8168.1	4	1970.38	2^+
		10138.0	4	0.0	0^+
10143.0	$(1^-,2)$	3006.4	7	7136.5	$(1^-,2^+)$
		5168.6	24	4974.05	2^-
		5191.2	5	4951.4	2^+
		5702.4	5	4440.11	2^+
		5728.1	2	4414.40	4^+
		5813.4	<2	4329.1	$(0,1,2)^+$
		5964.2	7	4178.32	3^-
		8171.6	88	1970.38	2^+
		10141.5	100	0.0	0^+
10149.6	$(3^-,4)$	2477.4	11	7672.1	$(3)^-$
		2576.4	11	7573.1	4^-
		2890.9	17	7258.6	3^-
		3009.7	44	7139.6	3^+
		3313.0	33	6836.50	3^-
		3314.3	72	6835.16	4^-
		3932.1	94	6217.3	5^-
		4253.4	6	5895.92	4^-
		4978.1	100	5171.13	5^-
		5734.7	67	4414.40	4^+
		5820.0	<11	4329.1	$(0,1,2)^+$
		5970.8	89	4178.32	3^-
		8178.2	<11	1970.38	2^+
		10148.1	11	0.0	0^+
10167.4	3^-	2495.2	18	7672.1	$(3)^-$
		4310.5	30	5856.65	3^-
		5193.0	8	4974.05	2^-
		5726.8	25	4440.11	2^+
		5752.5	100	4414.40	4^+

From ENSDF

$^{36}_{18}Ar_{18}$-24

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
10167.4	3^-	5837.8	<5	4329.1	$(0,1,2)^+$		
		5988.6	32	4178.32	3^-		
		8196.0	25	1970.38	2^+		
		10165.9	13	0.0	0^+		
10173.4	$(1^-,2^+)$	2294.3	1	7879	$(1,2)^-$		
		3562.2	1	6611.0	2^+		
		5732.8	2	4440.11	2^+		
		5758.5	<1	4414.40	4^+		
		5843.8	1	4329.1	$(0,1,2)^+$		
		5994.5	<1	4178.32	3^-		
		8202.0	10	1970.38	2^+		
		10171.9	100	0.0	0^+		
10186	1^-	10184	100	0.0	0^+	E1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
10193.6	$(3^-,4,5,6^+)$	5022.1	15	5171.13	5^-		
		5778.7	100	4414.40	4^+		
		5864.0	<7	4329.1	$(0,1,2)^+$		
		6014.7	<5	4178.32	3^-		
10217	2^+	10215		0.0	0^+	E2	Mult.: from ^{32}S(α,γ):res.
10220.3	$4^{(-)}$	3080.6	20	7139.6	3^+	(E1)	
		3574.5	4	6645.6	$(2^+,3^+,4^+)$		
		3864.1	7	6356.0	4^+		
		5805.4	100	4414.40	4^+		
		5890.7	<1	4329.1	$(0,1,2)^+$		
		6041.4	3	4178.32	3^-		
		8248.9	1	1970.38	2^+		
		10218.7	<0.1	0.0	0^+		
10256.0	$(3^-,4)$	2240.0	15	8015.9	$(3,4)^-$		
		2583.8	15	7672.1	$(3)^-$		
		2682.8	7	7573.1	4^-		
		2902.0	7	7353.9	6^-		
		2919.3	15	7336.6	3^+		
		3420.7	63	6835.16	4^-		
		3531.8	7	6724	NOT $(2)^+$		
		4038.5	56	6217.3	5^-		
		5084.5	100	5171.13	5^-		
		5841.1	33	4414.40	4^+		
		5926.4	<7	4329.1	$(0,1,2)^+$		
		6077.1	52	4178.32	3^-		
		8284.6	<7	1970.38	2^+		
		10254.4	<4	0.0	0^+		
10257.5	$(3^-,4^+)$	5086.0	7	5171.13	5^-		

From ENSDF

$^{36}_{18}Ar_{18}$-25

Adopted Levels, Gammas (continued)

$\gamma(^{36}Ar)$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f
10257.5	$(3^-,4^+)$	5842.6	100	4414.40	4^+
		5927.9	<3	4329.1	$(0,1,2)^+$
		6078.6	<5	4178.32	3^-
		8286.1	3	1970.38	2^+
		10255.9	<1	0.0	0^+
10267.3	1^-	3400.2	4	6866.9	$(1^+,2^+)$
		4410.4	2	5856.65	3^-
		5072.5	4	5194.4	$(0^+,1^+,2^+,3^-)$
		5826	8	4440.11	2^+
		5852.4	<2	4414.40	4^+
		5937.7	8	4329.1	$(0,1,2)^+$
		6088.4	<4	4178.32	3^-
		8295.9	100	1970.38	2^+
		10265.7	64	0.0	0^+
10271.7	$(3^-,4^-,5^-)$	2254.7	29	8015.9	$(3,4)^-$
		2599.5	21	7672.1	$(3)^-$
		3436.4	92	6835.16	4^-
		4054.2	54	6217.3	5^-
		4414.8	25	5856.65	3^-
		5100.2	100	5171.13	5^-
		5856.8	13	4414.40	4^+
		5942.1	<4	4329.1	$(0,1,2)^+$
		6092.8	83	4178.32	3^-
10281.1	3^-	2944.4	41	7336.6	3^+
		3669.9	100	6611.0	2^+
		5109.6	50	5171.13	5^-
		5306.6	77	4974.05	2^-
		5329.3	95	4951.4	2^+
		5840.5	50	4440.11	2^+
		5866.2	23	4414.40	4^+
		5951.5	<14	4329.1	$(0,1,2)^+$
		6102.2	18	4178.32	3^-
		8309.7	<9	1970.38	2^+
		10279.5	<5	0.0	0^+
10301.5	4^+	2964.8	3	7336.6	3^+
		3464.8	1	6836.50	3^-
		4164.7	0.7	6136.5	4^+
		5860.9	14	4440.11	2^+
		5886.6	13	4414.40	4^+
		5971.9	<1	4329.1	$(0,1,2)^+$
		6122.6	7	4178.32	3^-
		8330.1	100	1970.38	2^+

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
10301.5	4^+	10299.9	<0.4	0.0	0^+		
10308.7	$(2,3)^-$	2972.0	11	7336.6	3^+		
		3050.0	5	7258.6	3^-		
		4412.5	9	5895.92	4^-		
		5868.1	48	4440.11	2^+		
		5893.8	<7	4414.40	4^+		
		5979.1	<10	4329.1	$(0,1,2)^+$		
		6129.8	41	4178.32	3^-		
		8337.3	100	1970.38	2^+		
10319.5	2^+	4462.6	6	5856.65	3^-		
		5345.0	6	4974.05	2^-		
		5878.9	3	4440.11	2^+		
		5904.6	<1	4414.40	4^+		
		5989.9	<1	4329.1	$(0,1,2)^+$		
		6140.6	1	4178.32	3^-		
		8348.1	27	1970.38	2^+		
		10317.9	100	0.0	0^+		
10328	2^+	8356.6	35 *20*	1970.38	2^+	M1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		10326	100	0.0	0^+	E2	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
10329.0	$(3^-,4^-,5^-)$	3070.3	23	7258.6	3^-		
		3492.3	38	6836.50	3^-		
		4432.8	19	5895.92	4^-		
		5157.5	9	5171.13	5^-		
		5914.1	100	4414.40	4^+		
		5999.4	<4	4329.1	$(0,1,2)^+$		
		6150.1	<6	4178.32	3^-		
		8357.6	<4	1970.38	2^+		
10420.8	3^-	2671.0	5	7749.7	2^-		
		3162.1	9	7258.6	3^-		
		3173.3	5	7247.4	$(1,2,3)^-$		
		3584.1	14	6836.50	3^-		
		4525.6	7	5895.92	4^-		
		4563.8	32	5856.65	3^-		
		5446.3	2	4974.05	2^-		
		5980.2	2	4440.11	2^+		
		6005.9	18	4414.40	4^+		
		6091.2	<2	4329.1	$(0,1,2)^+$		
		6241.9	100	4178.32	3^-		
		8449.4	34	1970.38	2^+		
10435.0	$(1,2,3^-)$	3098.3	17	7336.6	3^+		
		4598.7	8	5836.0	1^-		

From ENSDF

$^{36}_{18}Ar_{18}$-27

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
10435.0	(1,2,3$^-$)	5994.4	17	4440.11	2$^+$		
		6020.1	<2	4414.40	4$^+$		
		6256.1	17	4178.32	3$^-$		
		8463.6	50	1970.38	2$^+$		
		10433.4	100	0.0	0$^+$		
10488.1	3$^-$	6310.1	70 *40*	4178.32	3$^-$	M1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		8517.5	100	1970.38	2$^+$	E1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		10487		0.0	0$^+$		E_γ: from ^{32}S(α,γ):res.
10500.2	(1,2,3)$^-$	3241.4	31	7258.6	3$^-$		
		3252.6	31	7247.4	(1,2,3)$^-$		
		3663.5	19	6836.50	3$^-$		
		3889.0	31	6611.0	2$^+$		
		4663.9	46	5836.0	1$^-$		
		5525.7	42	4974.05	2$^-$		
		6085.3	<8	4414.40	4$^+$		
		6170.5	<12	4329.1	(0,1,2)$^+$		
		6321.3	100	4178.32	3$^-$		
		8528.7	77	1970.38	2$^+$		
		10498.6	8	0.0	0$^+$		
10539.6	3$^-$	4703.3	3	5836.0	1$^-$		
		5565.1	4	4974.05	2$^-$		
		6098.9	15	4440.11	2$^+$		
		6210.0	<3	4329.1	(0,1,2)$^+$		
		6360.7	<4	4178.32	3$^-$		
		8568.1	100	1970.38	2$^+$		
		10537.9	6	0.0	0$^+$		
10562.1	3$^-$	2988.9	35	7573.1	4$^-$		
		3225.3	23	7336.6	3$^+$		
		3303.3	12	7258.6	3$^-$		
		3314.5	12	7247.4	(1,2,3)$^-$		
		3726.7	38	6835.16	4$^-$		
		3950.9	15	6611.0	2$^+$		
		4344.5	19	6217.3	5$^-$		
		4705.1	12	5856.65	3$^-$		
		5587.6	100	4974.05	2$^-$		
		6232.4	<8	4329.1	(0,1,2)$^+$		
		6383.2	77	4178.32	3$^-$		
		8590.6	20	1970.38	2$^+$		
		10560.4	4	0.0	0$^+$		
10582.9	5$^-$	2566.9	5	8015.9	(3,4)$^-$		
		2910.7	4	7672.1	(3)$^-$		

From ENSDF

$^{36}_{18}Ar_{18}$-28

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
10582.9	5⁻	3228.8	35	7353.9	6⁻			
		3324.1	2	7258.6	3⁻			
		4365.3	100	6217.3	5⁻			
		4686.7	5	5895.92	4⁻			
		5411.3	12	5171.13	5⁻			
		5608.4	1	4974.05	2⁻			
		6167.9	<2	4414.40	4⁺			
		6253.2	<2	4329.1	(0,1,2)⁺			
		6404.0	11	4178.32	3⁻			
		8611.4	1	1970.38	2⁺			
10596	3⁻	8624.5	100	1970.38	2⁺	E1		E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		10594	<6	0.0	0⁺			E_γ,I_γ: from ^{32}S(α,γ):res.
10615.6	4⁻	3042.4	50	7573.1	4⁻	M1+E2	+0.18 *+12−44*	
		3278.8	6	7336.6	3⁺			
		3356.8	9	7258.6	3⁻	M1		
		3780.2	100	6835.16	4⁻	M1		
		4398.0	43	6217.3	5⁻	M1+E2	−0.19 *6*	
		4719.4	38	5895.92	4⁻	M1(+E2)	+0.11 *+10−38*	
		4758.5	34	5856.65	3⁻	M1		
		6200.6	25	4414.40	4⁺			
		6285.9	<3	4329.1	(0,1,2)⁺			
		6436.7	<3	4178.32	3⁻			
		8644.1	6	1970.38	2⁺			
		10613.9	<0.6	0.0	0⁺			
10635.7	1⁻	3376.9	6	7258.6	3⁻			
		4799.4	4	5836.0	1⁻			
		5661.2	4	4974.05	2⁻			
		6195.0	10	4440.11	2⁺			
		6220.7	<1	4414.40	4⁺			
		6306.0	<1	4329.1	(0,1,2)⁺			
		6456.8	3	4178.32	3⁻			
		8664.2	100	1970.38	2⁺			
		10634.0	0.6	0.0	0⁺			
10650.6	1⁻	8679.1	<16	1970.38	2⁺			E_γ,I_γ: from ^{32}S(α,γ):res.
		10648.6	100	0.0	0⁺	E1		E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
10675.9	5	3321.8	30	7353.9	6⁻	D(+Q)	+0.04 *4*	
		4319.6	13	6356.0	4⁺	D+Q	−0.07 *4*	
		4458.3	100	6217.3	5⁻	D(+Q)	−0.04 *8*	
		4779.6	15	5895.92	4⁻			
		5504.3	8	5171.13	5⁻	D(+Q)	−0.03 *17*	
		6260.9	<7	4414.40	4⁺			

From ENSDF

$^{36}_{18}Ar_{18}$-29

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
10675.9	5	6346.2	<5	4329.1	$(0,1,2)^+$			
		6497.0	<5	4178.32	3^-			
		10674.2	<2	0.0	0^+			
10700.4	2^+	3267.9	7	7432.3	1^+			
		3452.8	5	7247.4	$(1,2,3)^-$			
		3521.3	37	7178.9	$(1,2)^+$			
		3833.3	5	6866.9	$(1^+,2^+)$			
		4089.2	1	6611.0	2^+			
		4864.1	7	5836.0	1^-			
		5725.9	7	4974.05	2^-			
		5748.5	36	4951.4	2^+			
		6259.7	11	4440.11	2^+			
		6285.4	<1	4414.40	4^+			
		6370.7	1	4329.1	$(0,1,2)^+$			
		6521.5	100	4178.32	3^-	E1		
		8728.9	27	1970.38	2^+	M1+E2	+0.18 *11*	
		10698.7	14	0.0	0^+	E2		
10790.1	2^+	8818.6	100	1970.38	2^+	M1		E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		10788.1	<7	0.0	0^+			E_γ,I_γ: from ^{32}S(α,γ):res.
10808.9	$(1^-,2,3^-)$	2676.9	5	8131.9	1^+			
		3235.6	7	7573.1	4^-			
		3454.8	7	7353.9	6^-			
		3550.1	3	7258.6	3^-			
		3972.2	2	6836.50	3^-			
		4452.6	2	6356.0	4^+			
		4591.3	3	6217.3	5^-			
		4912.6	3	5895.92	4^-			
		4951.9	3	5856.65	3^-			
		5637.3	2	5171.13	5^-			
		5834.3	13	4974.05	2^-			
		6393.9	100	4414.40	4^+			
		6479.2	<2	4329.1	$(0,1,2)^+$			
		6629.9	3	4178.32	3^-			
		8837.4	3	1970.38	2^+			
		10807.2	7	0.0	0^+			
10823.4		4605.8	100	6217.3	5^-			
10832.3	$(1^-,3^-,4^+)$	8860.8	100	1970.38	2^+			
10845.7		4489.4	100	6356.0	4^+			
		4628.1	72	6217.3	5^-			
10852.0	2^+	8880.4	100	1970.38	2^+			
10853.8	0^+	2721.8	100 *23*	8131.9	1^+			

From ENSDF

$^{36}_{18}Ar_{18}$-30

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
10853.8	0^+	3143.4	54 *23*	7710.3	1^+		
10854	3^-	8882.4	100	1970.38	2^+	E1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		10852	<20	0.0	0^+		E_γ,I_γ: from ^{32}S(α,γ):res.
10906.0	(2^+ to 5^-)	2890.0	100	8015.9	$(3,4)^-$		
		3233.7	24	7672.1	$(3)^-$		
		3332.7	81	7573.1	4^-		
		3647.2	24	7258.6	3^-		
		3658.4	5	7247.4	$(1,2,3)^-$		
		4069.3	14	6835.16	4^-		
		4688.4	100	6217.3	5^-		
		5009.7	57	5895.92	4^-		
		5049.0	38	5856.65	3^-		
		5734.4	14	5171.13	5^-		
		6491.0	<5	4414.40	4^+		
		6576.3	<5	4329.1	$(0,1,2)^+$		
		6727.0	14	4178.32	3^-		
		8934.4	5	1970.38	2^+		
		10904.2	<1	0.0	0^+		
10955.7	(2^+ to 5^-)	2939.7		8015.9	$(3,4)^-$		
		3696.9	10	7258.6	3^-		
		3708.1[#]	10[#]	7247.4	$(1,2,3)^-$		
		4119.0	17	6836.50	3^-		
		4344.2	21	6611.0	2^+		
		5059.4	7	5895.92	4^-		
		5784.1	10	5171.13	5^-		
		6515.0	36	4440.11	2^+		
		6540.7	21	4414.40	4^+		
		6776.7	100	4178.32	3^-		
		8984.1	10	1970.38	2^+		
10968.1	1,2	5993.5	13	4974.05	2^-		
		6553.1	<1	4414.40	4^+		
		6789.1	4	4178.32	3^-		
		8996.5	24	1970.38	2^+		
		10966.3	100	0.0	0^+		
11027.7	(1^- to 5^-)	4671.4	11	6356.0	4^+		
		6586.9	6	4440.11	2^+		
		6612.7	96	4414.40	4^+		
		6697.9	<4	4329.1	$(0,1,2)^+$		
		6848.7	<4	4178.32	3^-		
		9056.1	100	1970.38	2^+		
		11025.9	<0.6	0.0	0^+		

From ENSDF

$^{36}_{18}Ar_{18}$-31

Adopted Levels, Gammas (continued)

γ(^{36}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
11040	2^+	9068.4	100	1970.38	2^+	M1	E_γ,I_γ,Mult.: from ^{32}S(α,γ):res.
		11038	<7	0.0	0^+		E_γ,I_γ: from ^{32}S(α,γ):res.
11149.4	(1,2,3$^-$)	5313.0	1	5836.0	1^-		
		5954.5	6	5194.4	(0^+,1^+,2^+,3^-)		
		6708.6	2	4440.11	2^+		
		6734.3	<1	4414.40	4^+		
		6819.6	1	4329.1	$(0,1,2)^+$		
		6970.4	0.3	4178.32	3^-		
		9177.8	10	1970.38	2^+		
		11147.5	100	0.0	0^+		
11182.3	(3^+ to 6^-)	2710.2	100	8472.0	(3^-,4^-,5^-)		
		2849.7	21	8332.5	$(3)^-$		
		3828.2	33	7353.9	6^-		
		4346.9	33	6836.50	3^-		
		4964.6	14	6217.3	5^-		
		6010.6	2	5171.13	5^-		
		6767.2	30	4414.40	4^+		
		6852.5	<2	4329.1	$(0,1,2)^+$		
		7003.3	<2	4178.32	3^-		
11336.4	2^+	3982.3	43	7353.9	6^-		
		4199.6	22	7136.5	(1^-,2^+)		
		4499.6	17	6836.50	3^-		
		5118.7	17	6217.3	5^-		
		5440.0	96	5895.92	4^-		
		6164.7	4	5171.13	5^-		
		6361.8	13	4974.05	2^-		
		6384.4	17	4951.4	2^+		
		6895.6	22	4440.11	2^+		
		6921.3	100	4414.40	4^+		
		7006.6	<4	4329.1	$(0,1,2)^+$		
		7157.3	4	4178.32	3^-		
		9364.7	65	1970.38	2^+		
		11334.5	<4	0.0	0^+		
11419.1		11419.1	100	0.0	0^+		
11902.1	10^+	1974.8 *10*	100	9927.0	8^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
12748.5	10^+	2821.4 *4*	100	9927.0	8^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
15350.8	12^+	2602.2 *4*	100.0 *15*	12748.5	10^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
		3448.4 *10*	22.4 *15*	11902.1	10^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
18298.6	14^+	2947.7 *5*	100	15350.8	12^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).
22365.3	16^+	4066.4 *12*	100	18298.6	14^+		E_γ,I_γ: from ^{24}Mg(^{20}Ne,2$\alpha\gamma$).

From ENSDF

$^{36}_{18}Ar_{18}$-32

Adopted Levels, Gammas (continued)

$\gamma(^{36}Ar)$ (continued)

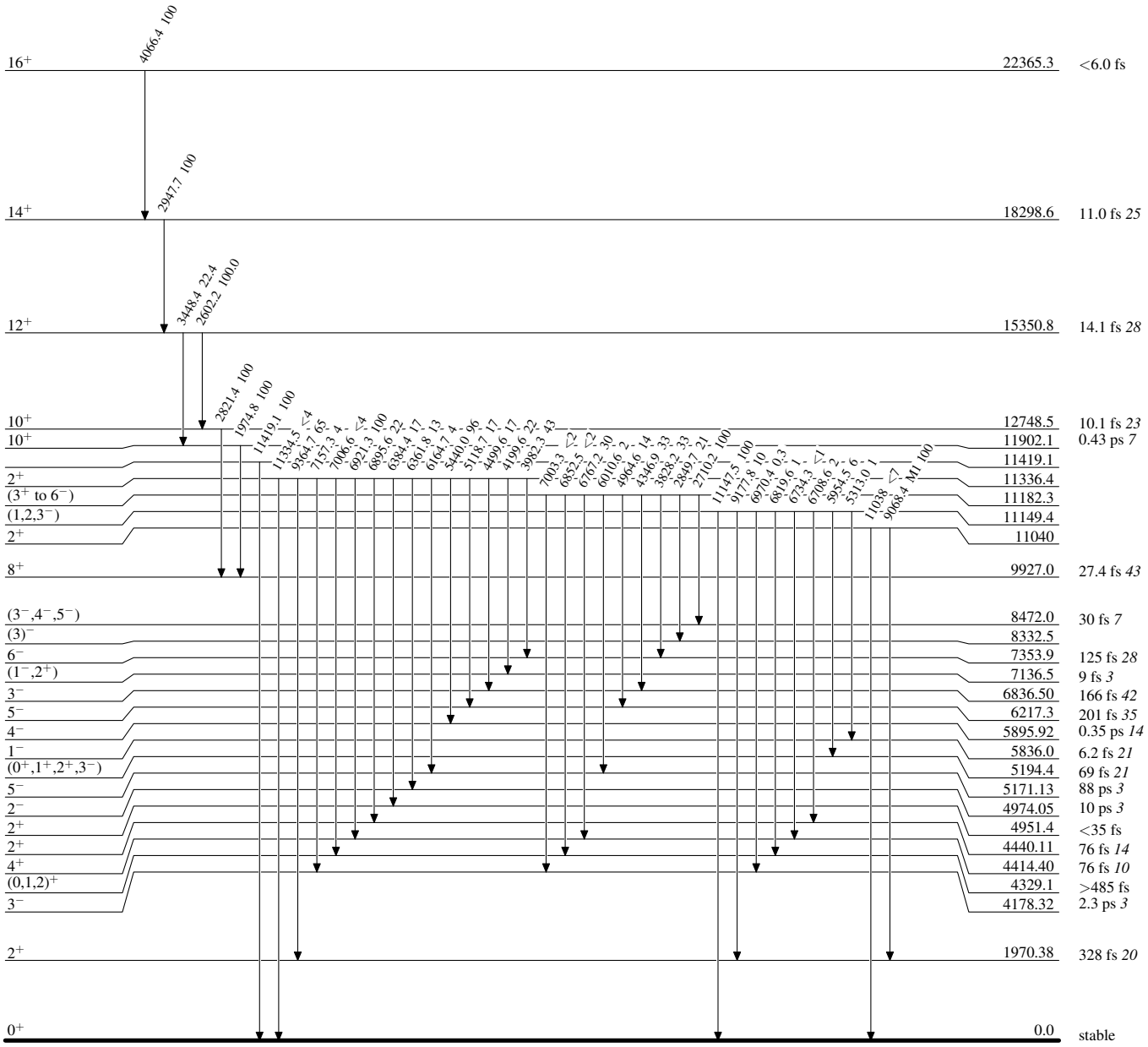
† From $^{35}Cl(p,\gamma)$:res, unless noted otherwise.
‡ From $^{35}Cl(p,\gamma)$:res by angular correlations and polarization measurements, unless noted otherwise.
# Multiply placed with undivided intensity.

$^{36}_{18}Ar_{18}$-33

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

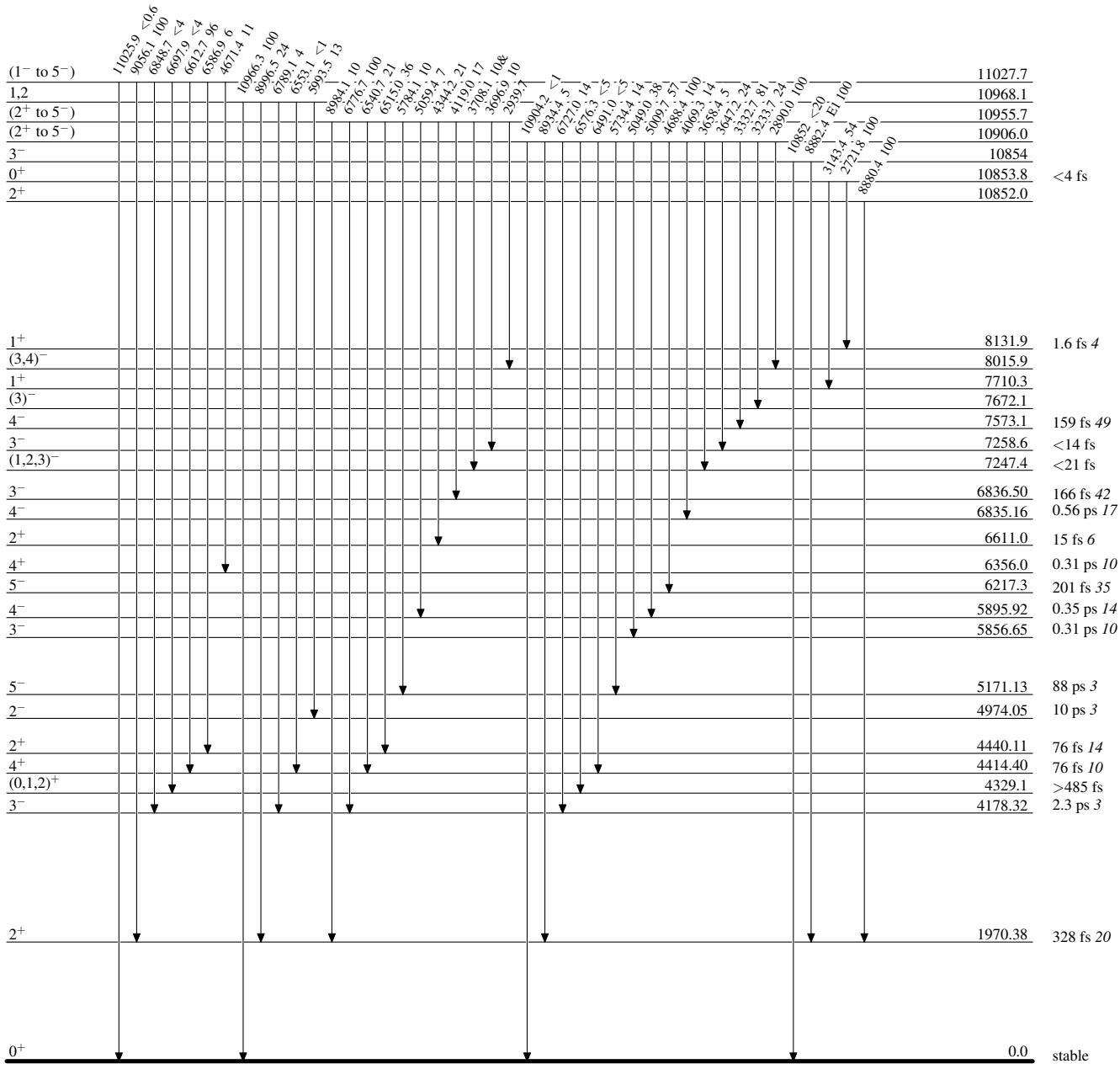


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

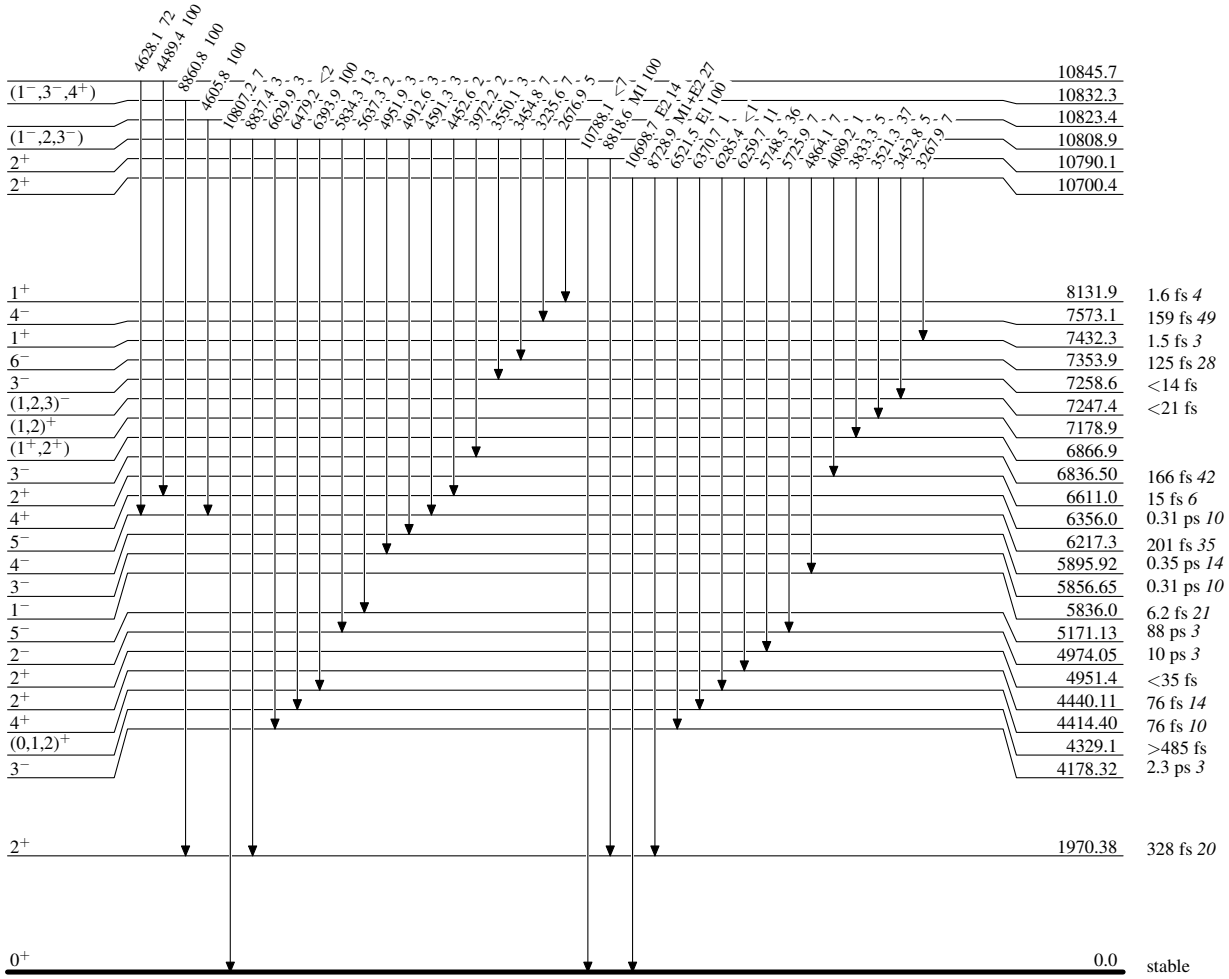


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

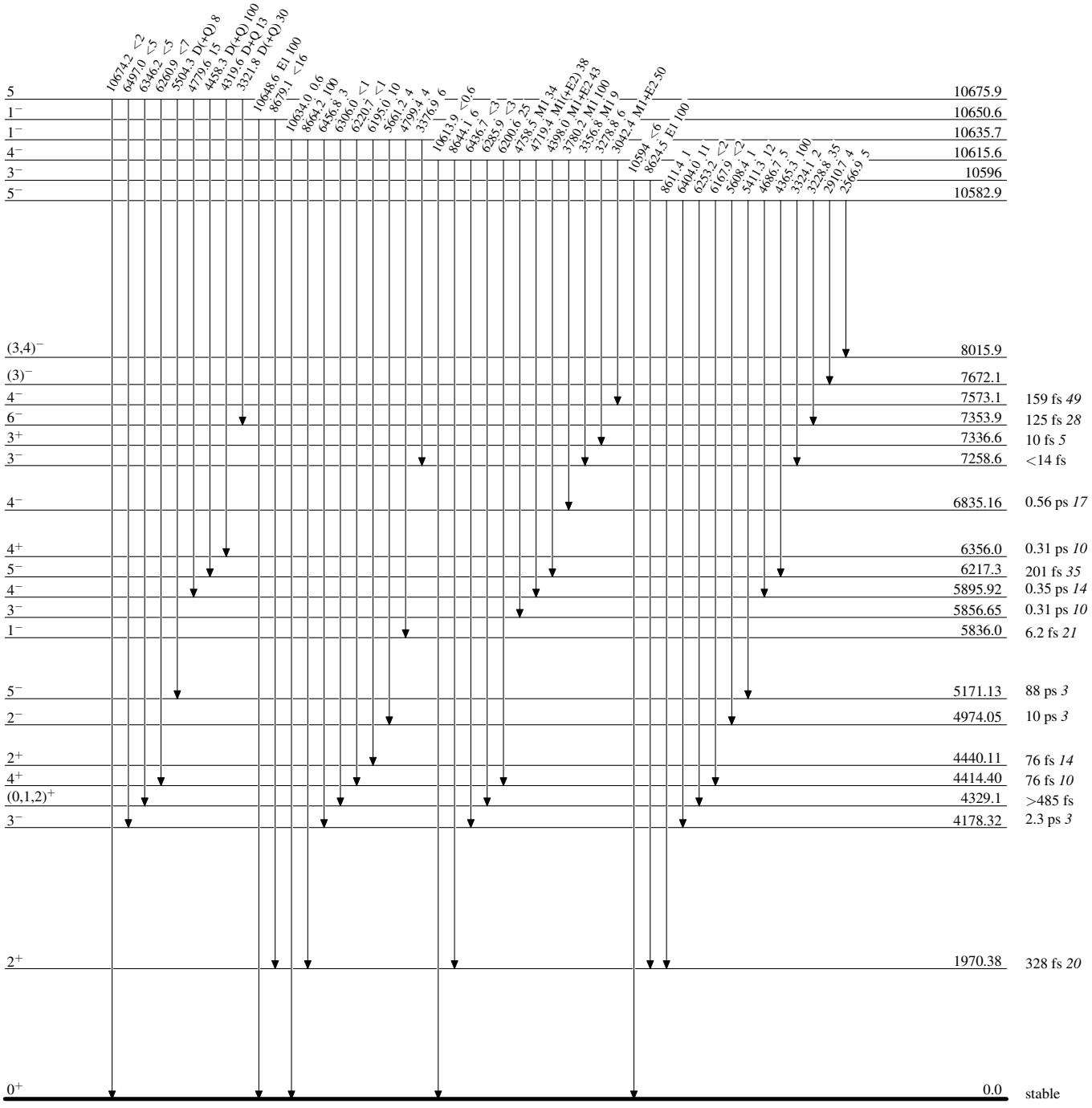


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

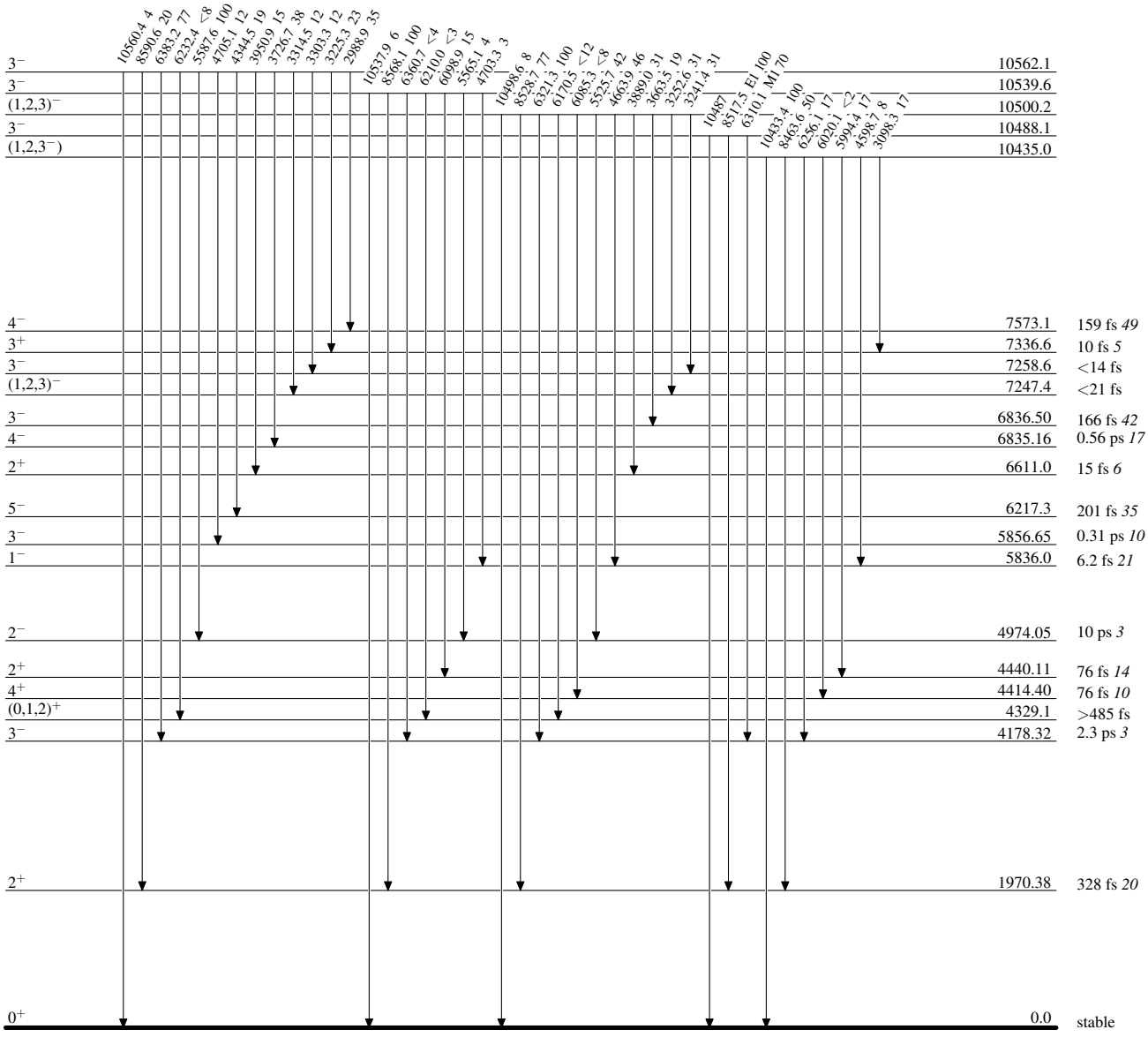


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

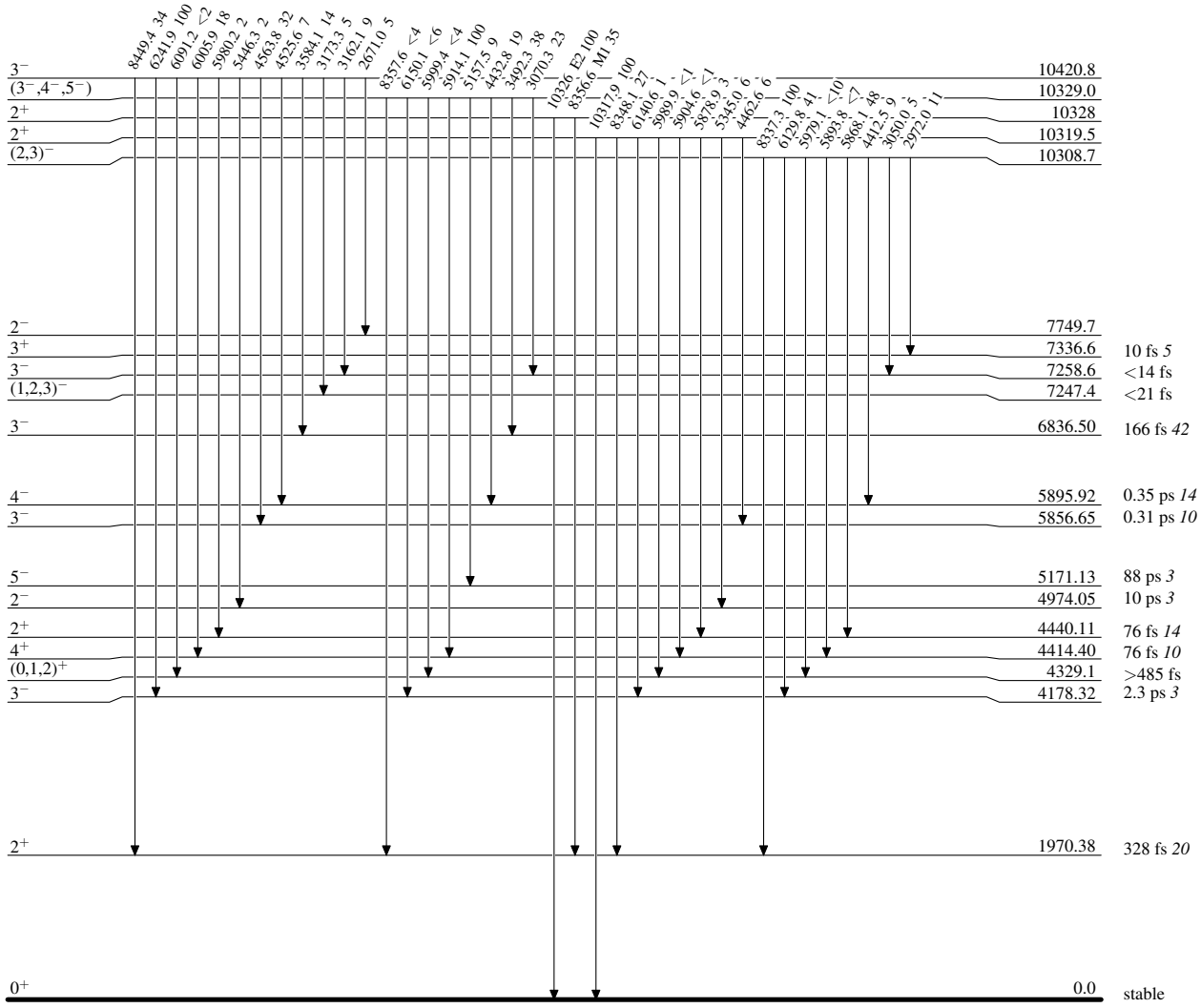


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

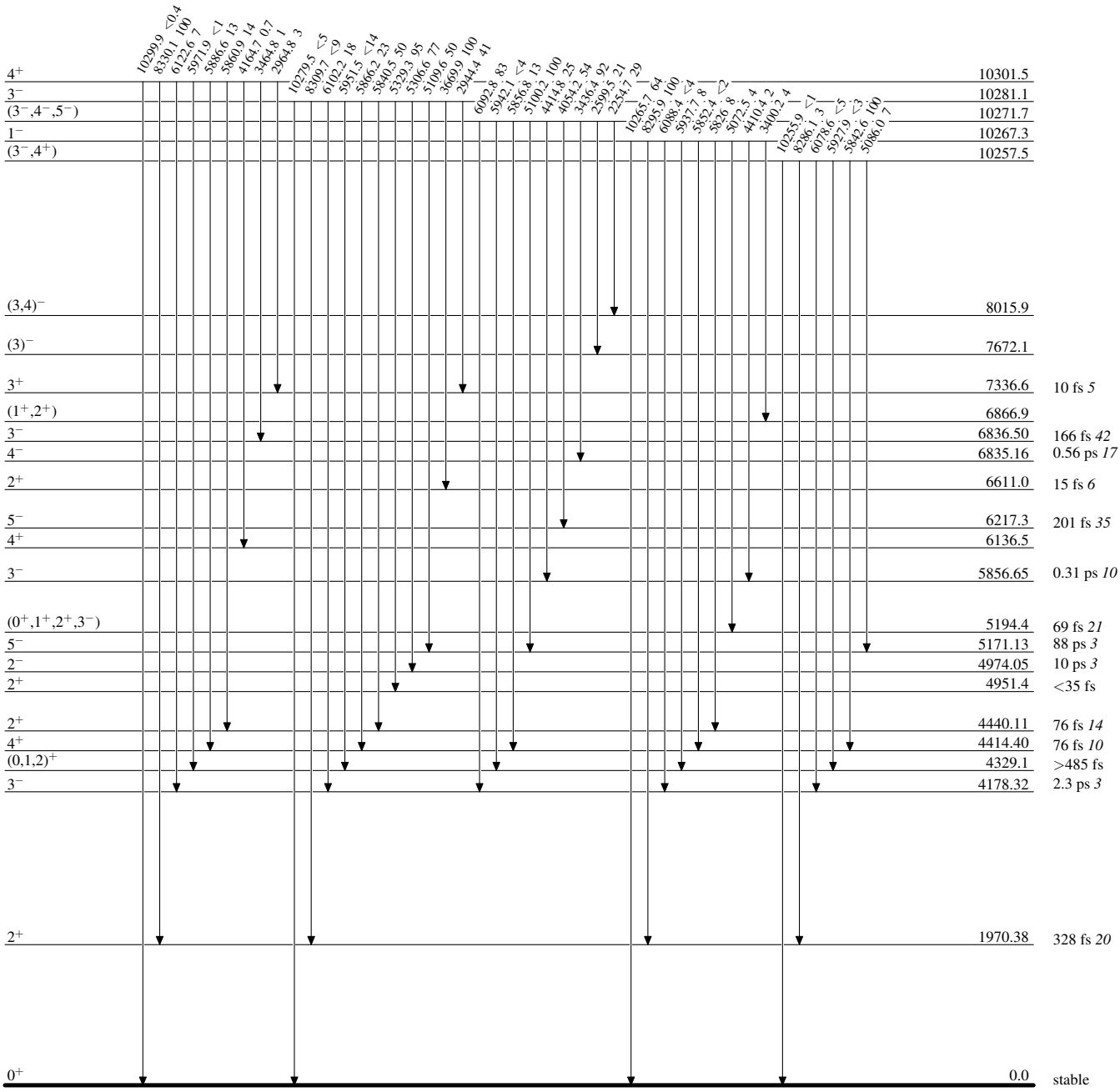


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

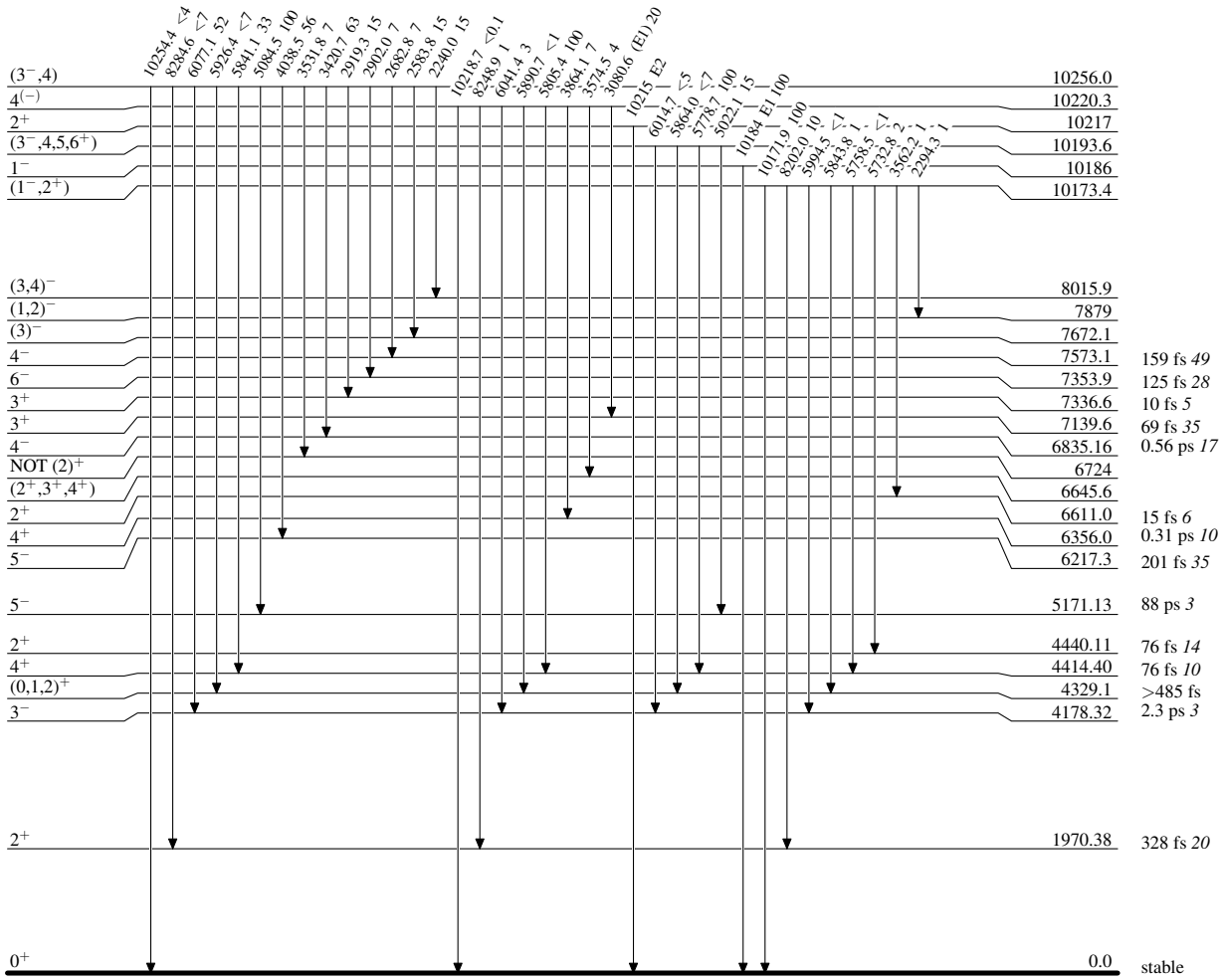


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

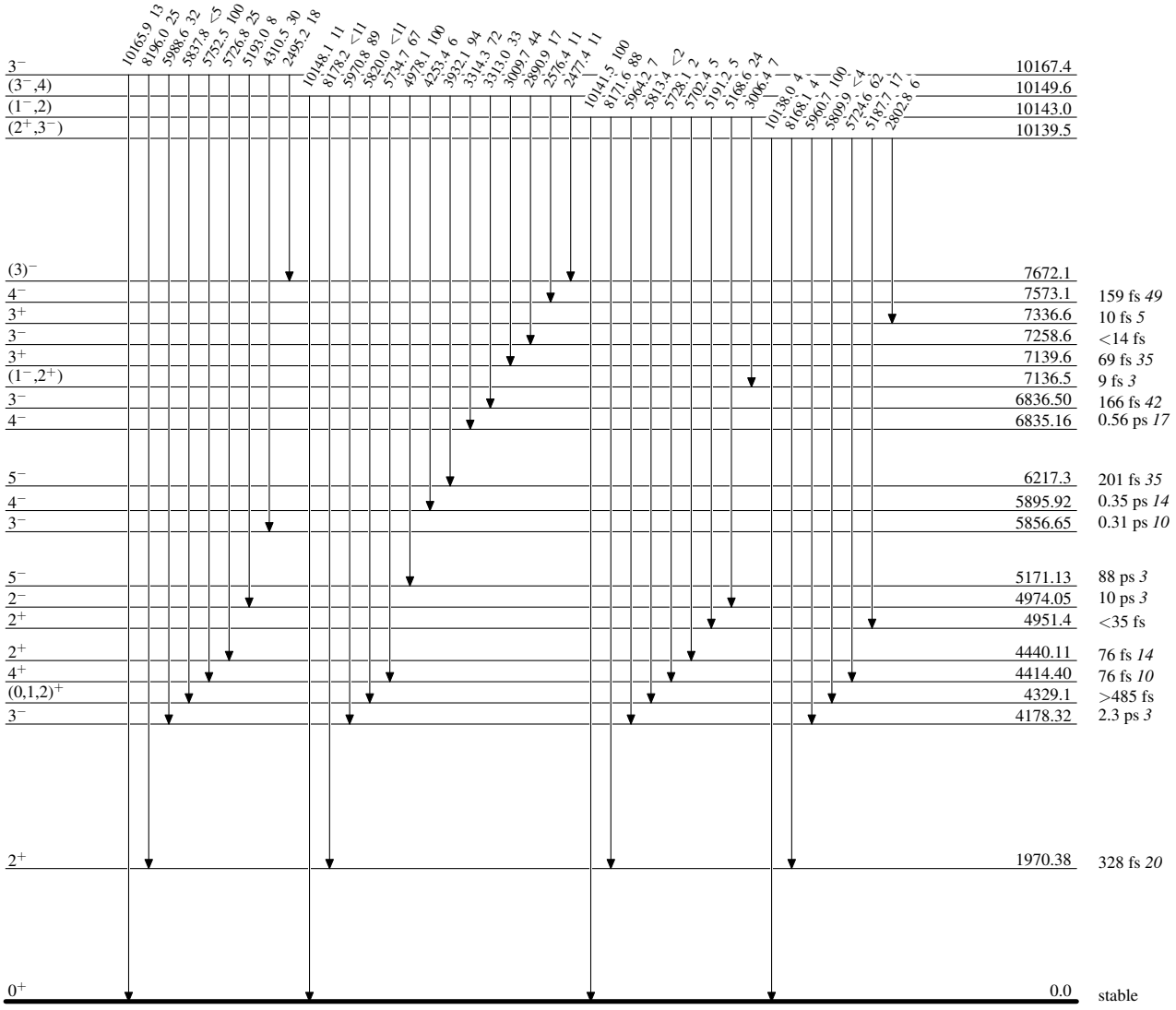
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

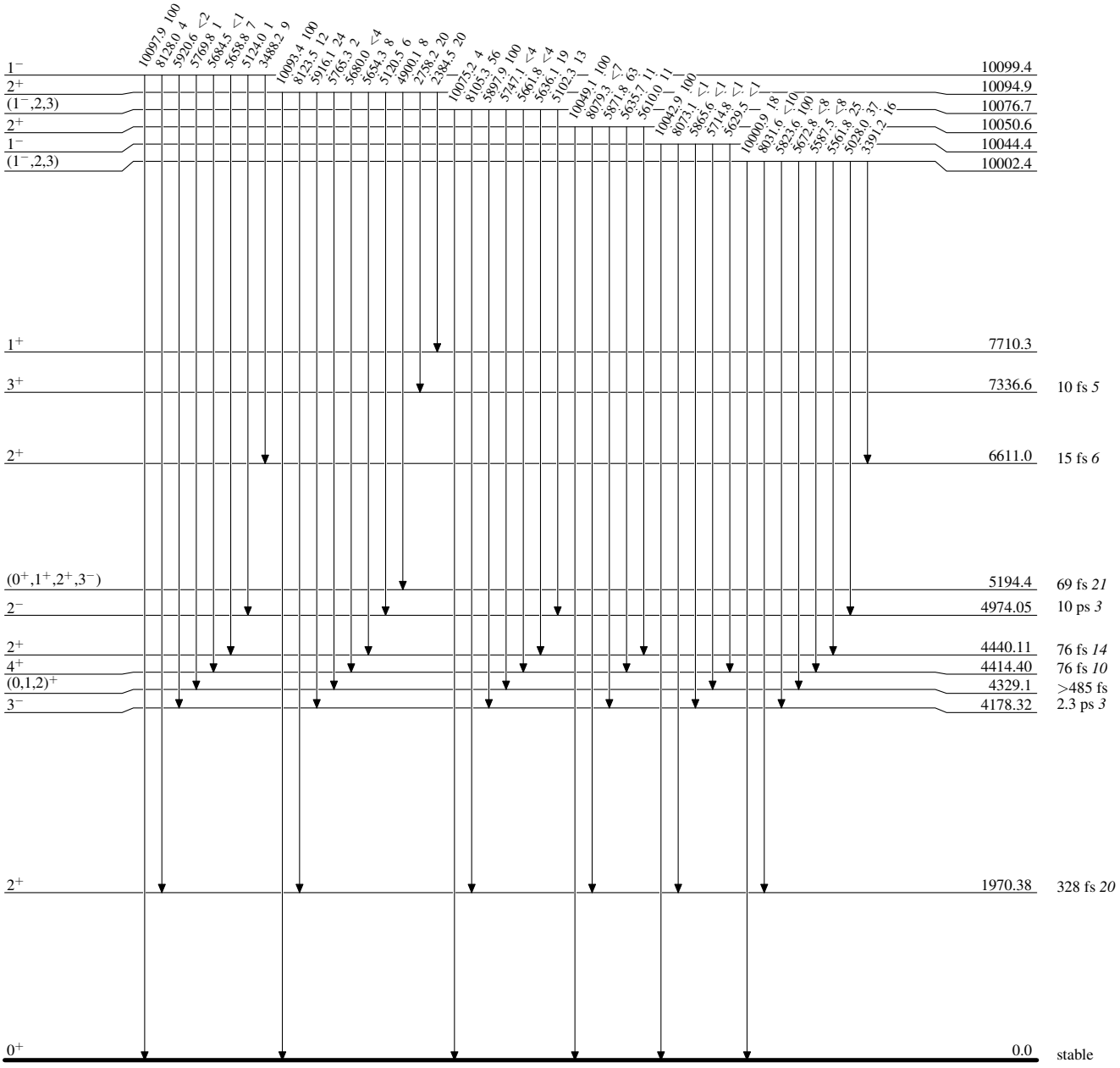


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

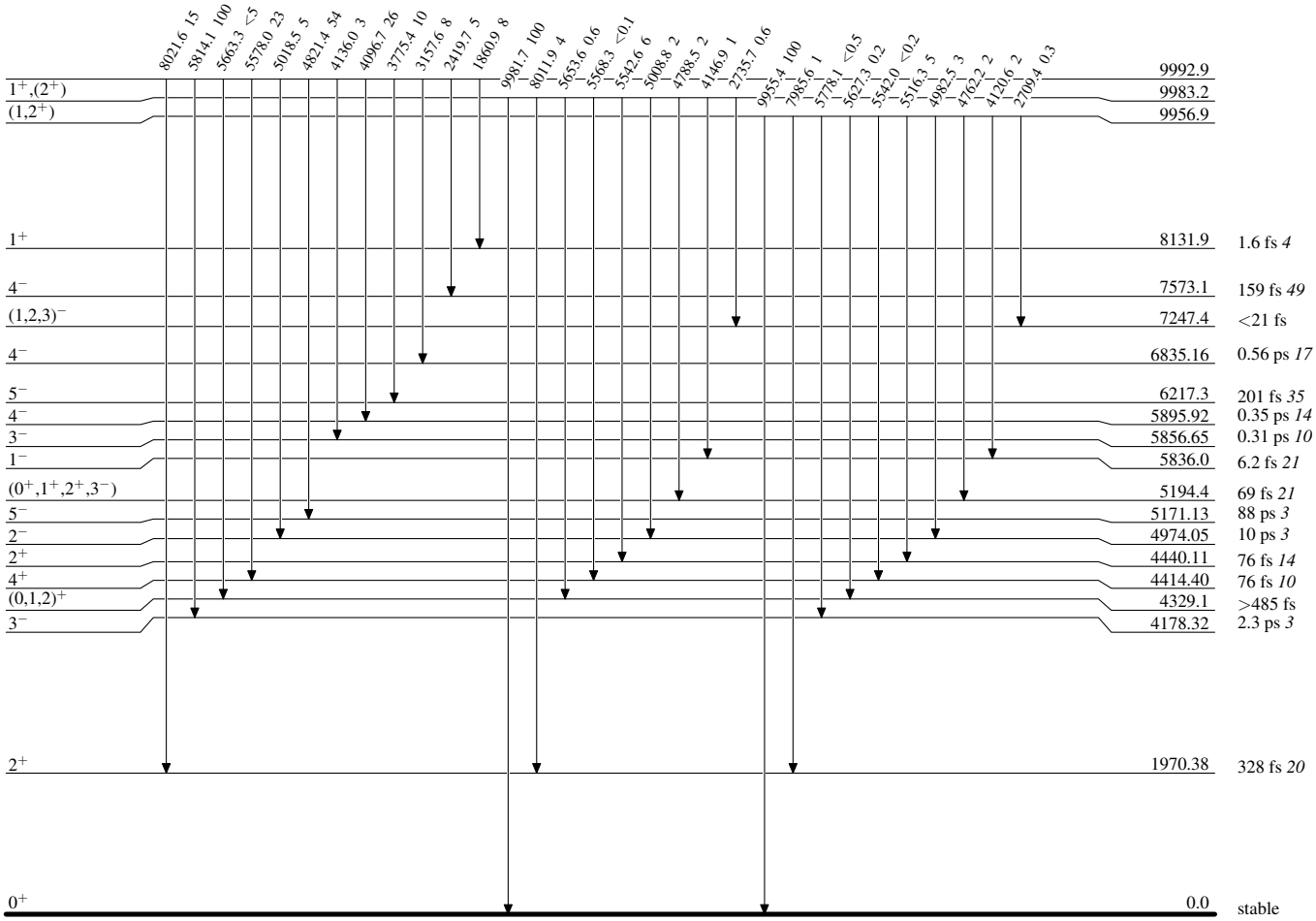


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

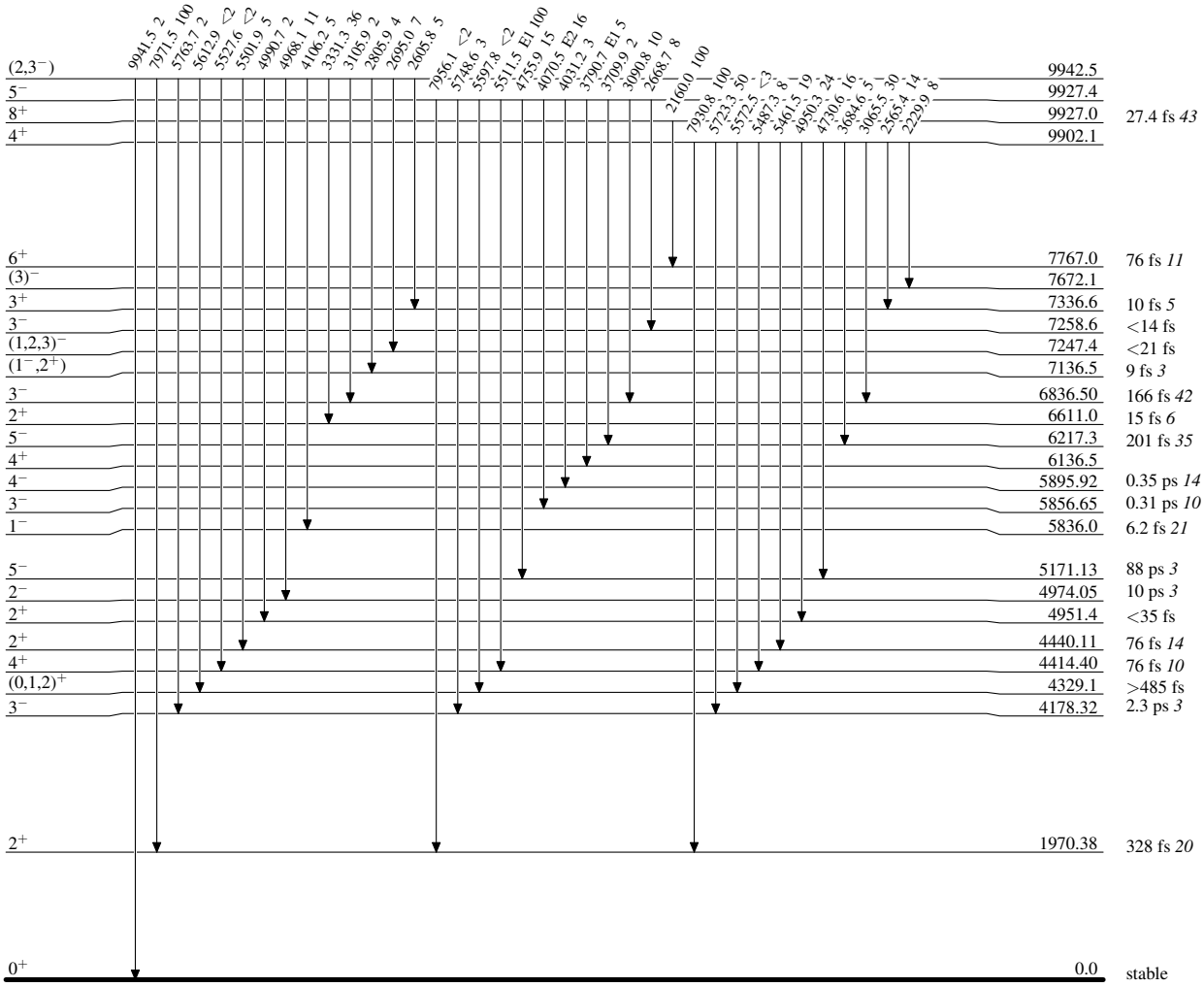


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

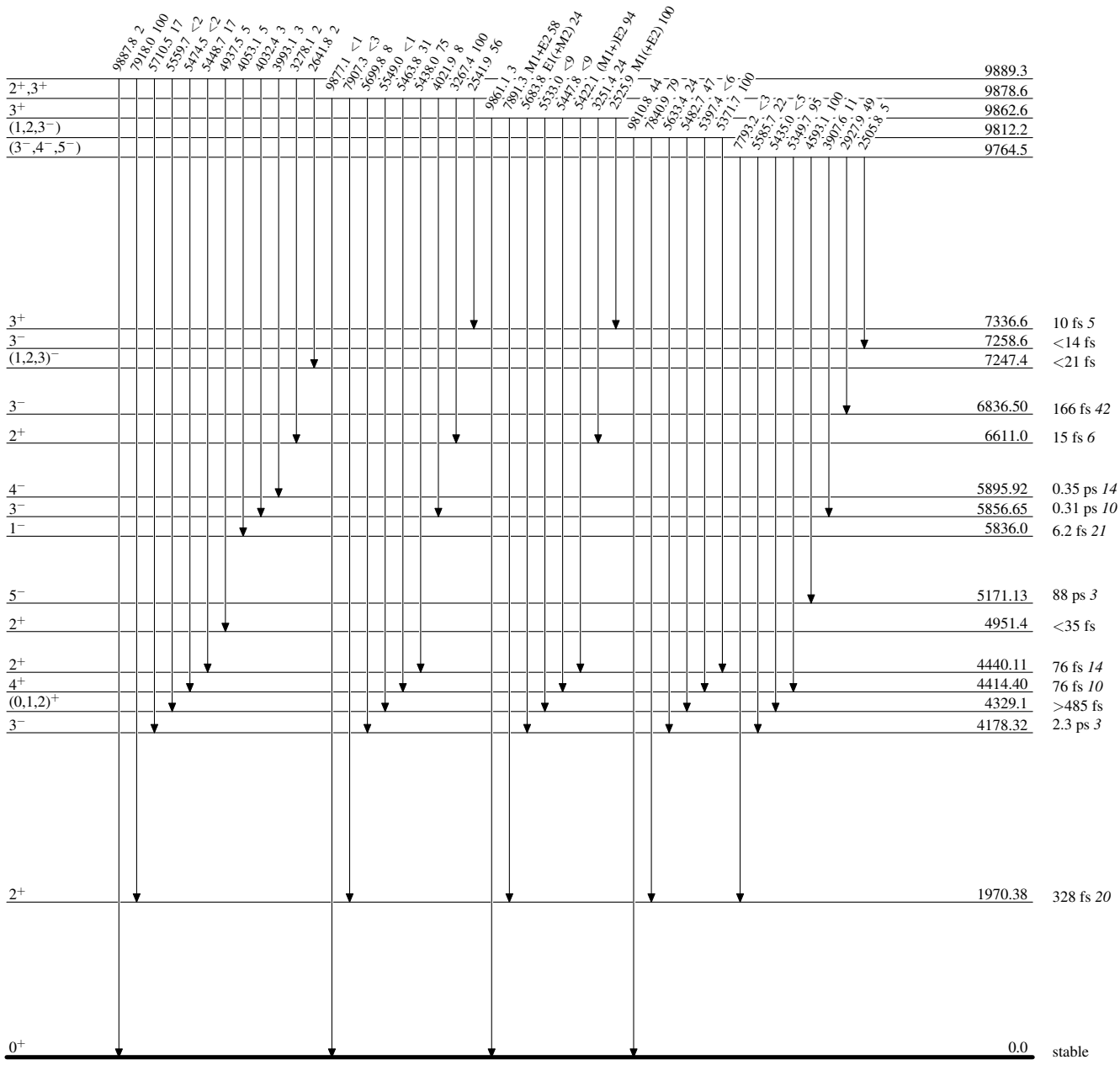


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

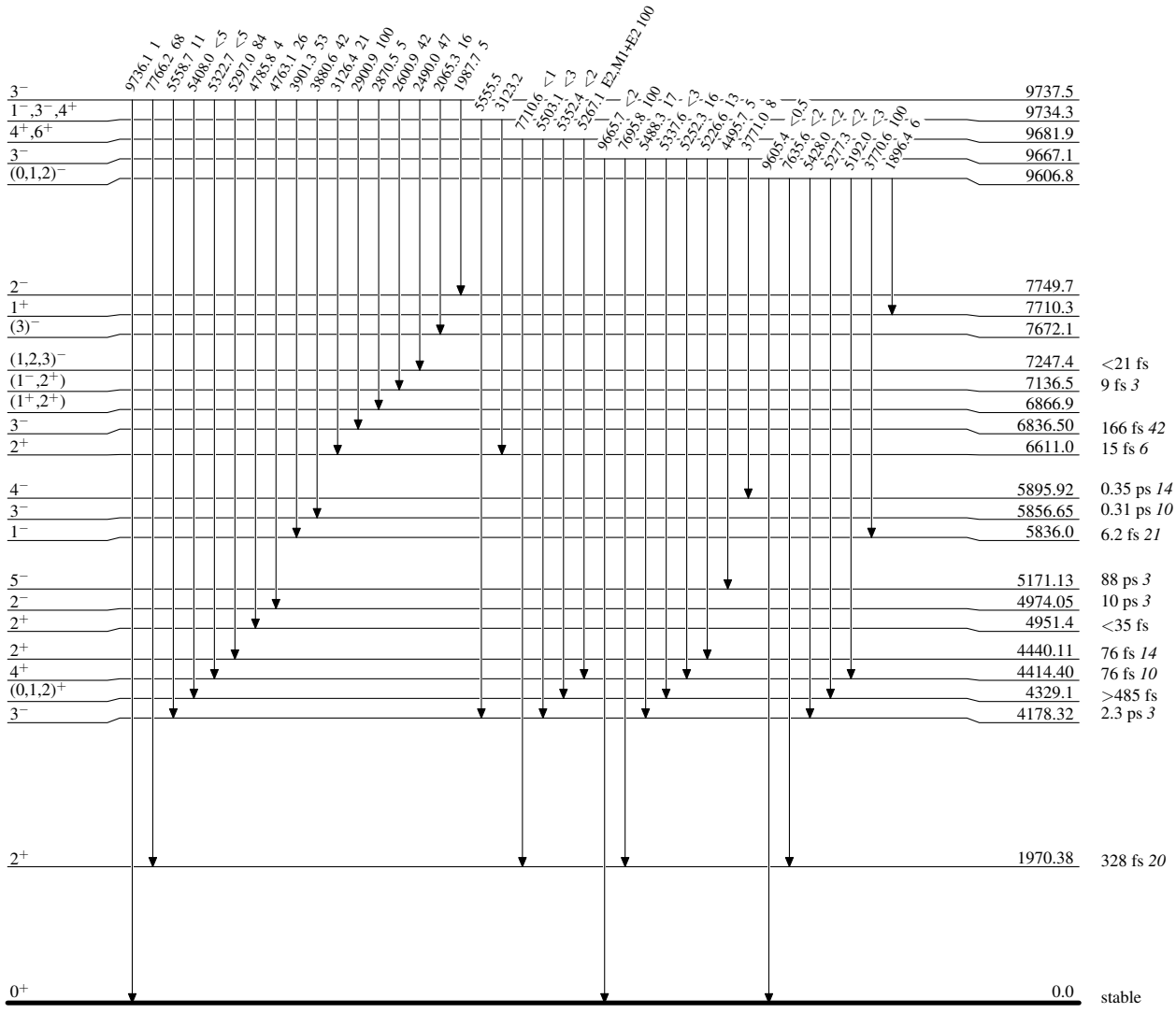


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

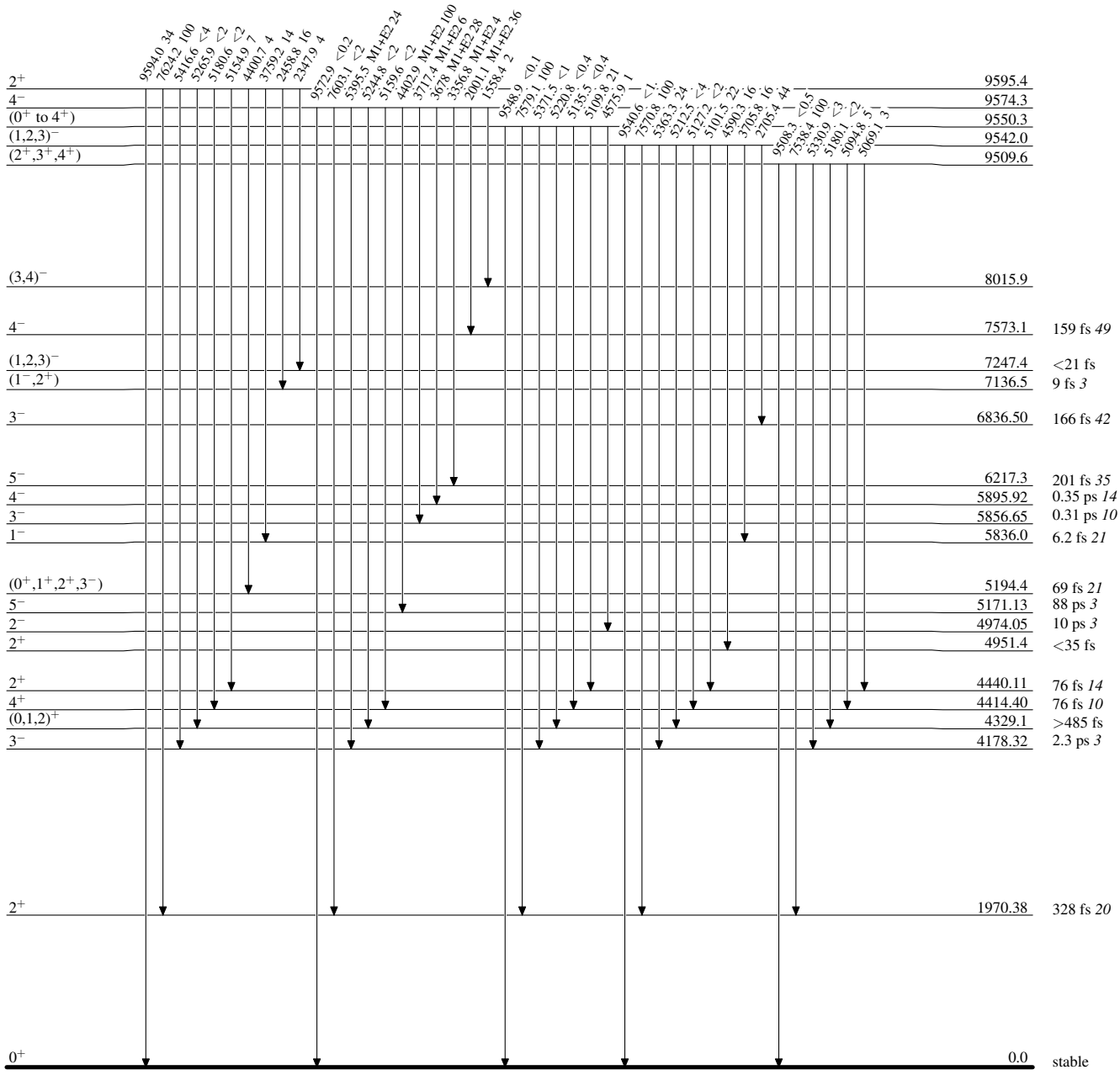


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

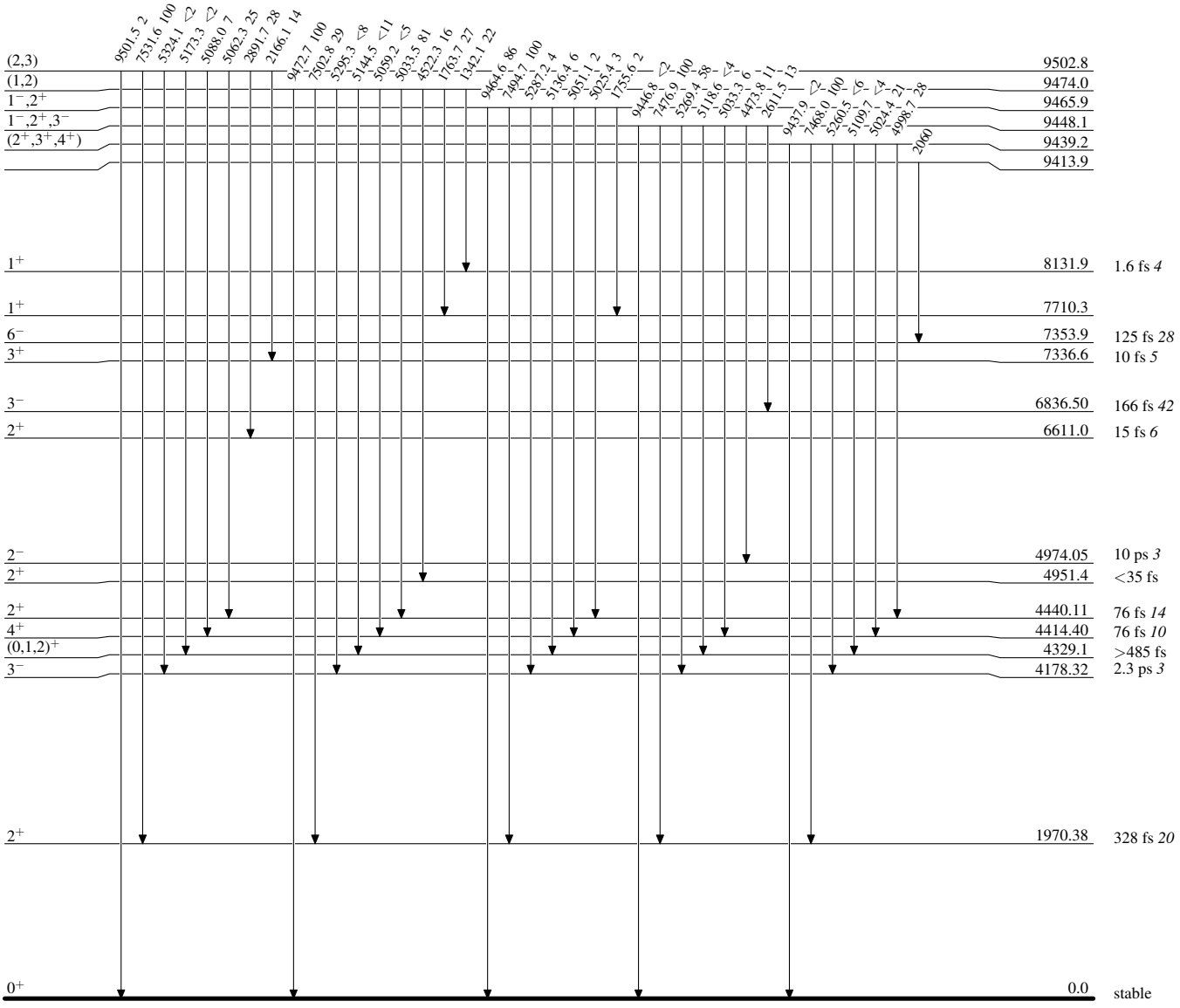


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

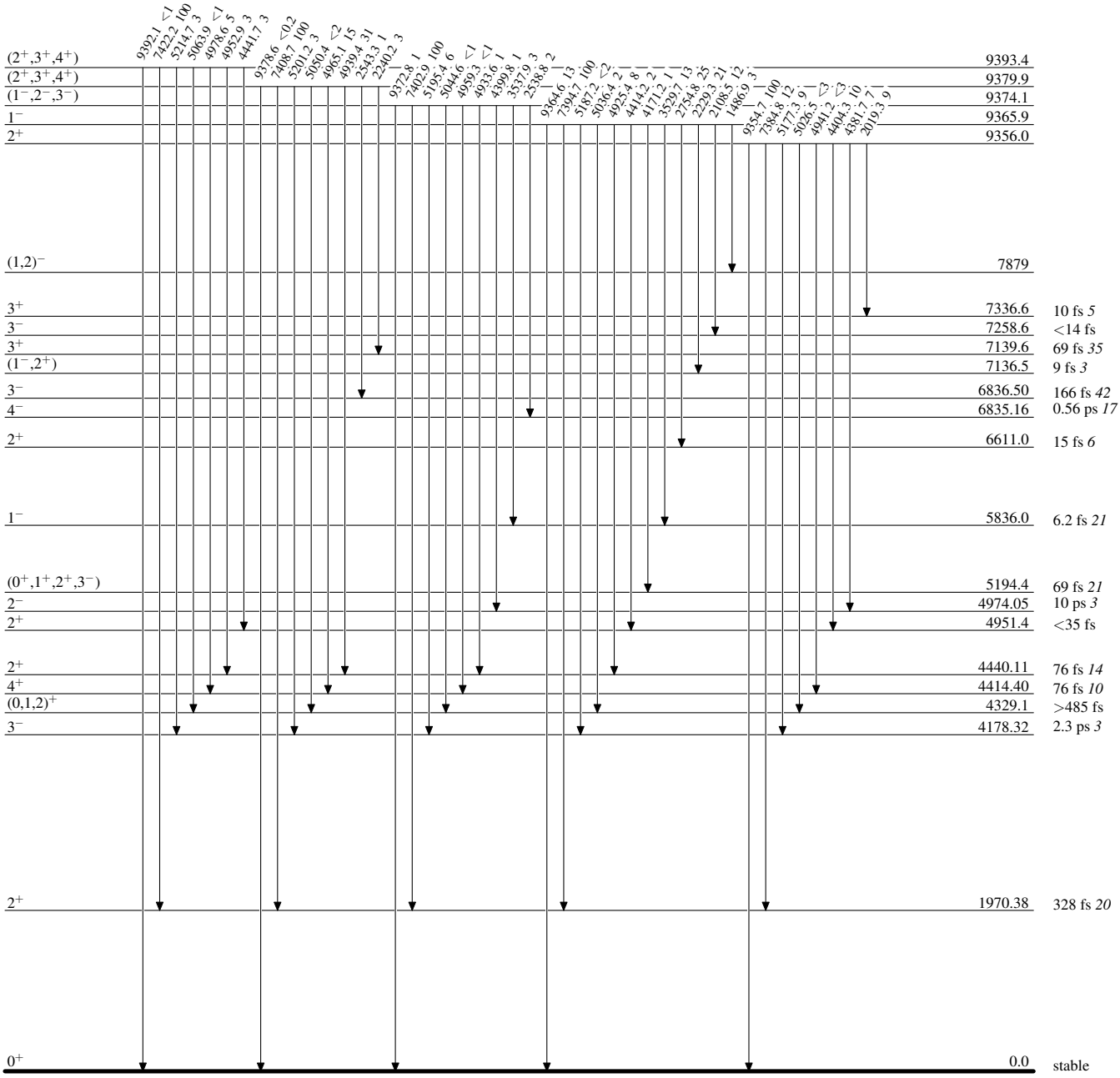


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

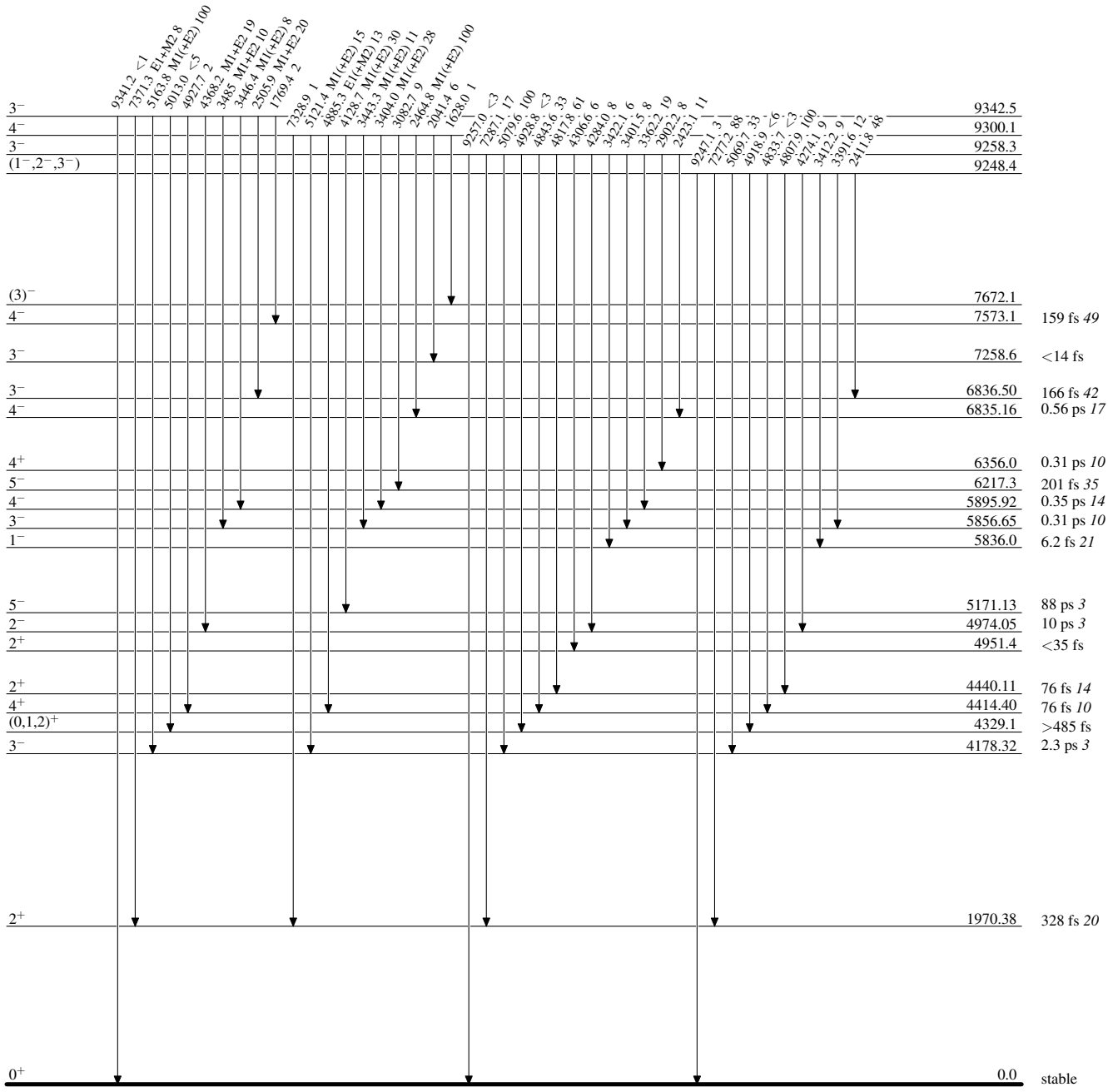


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

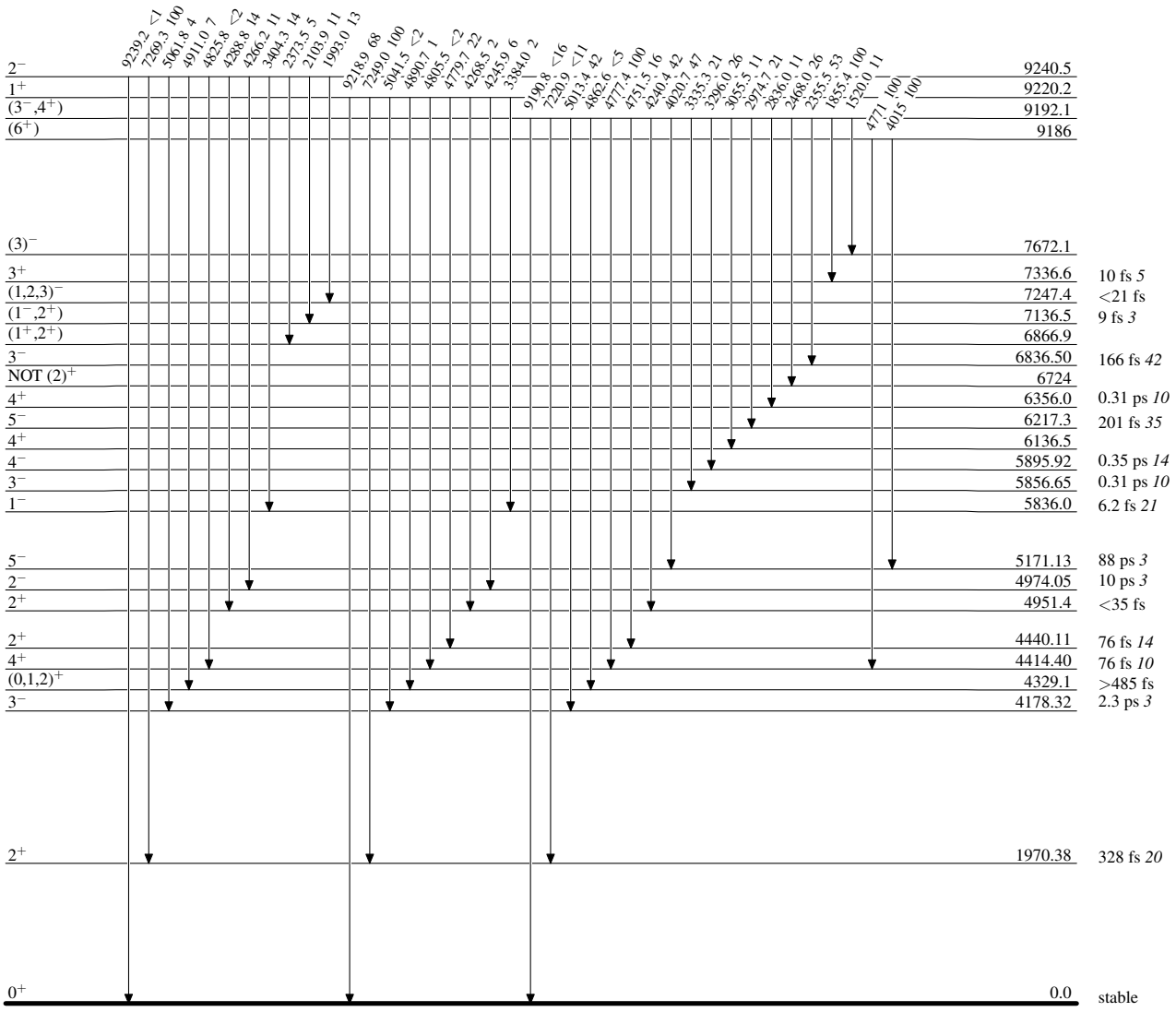


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

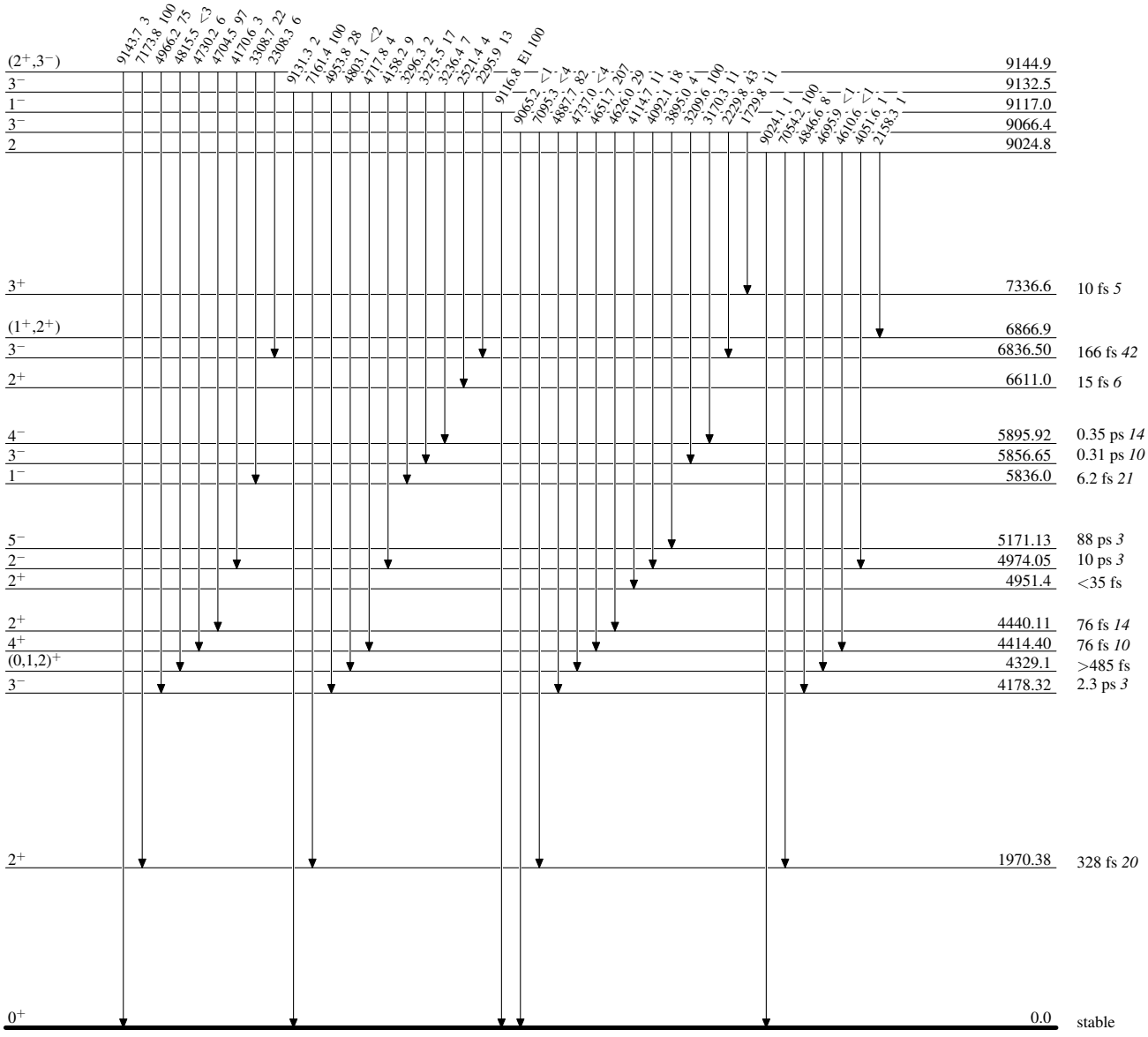


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

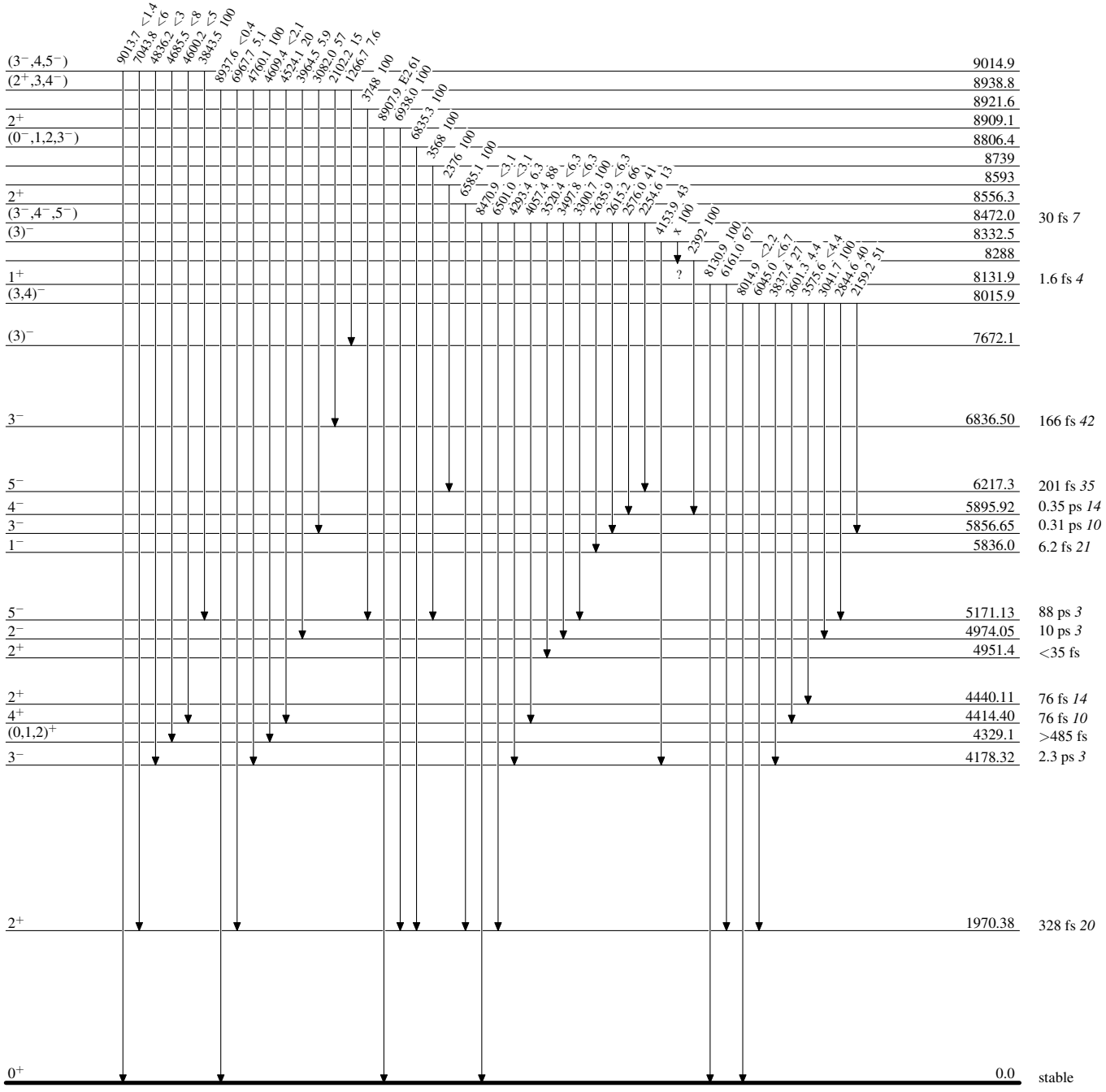
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

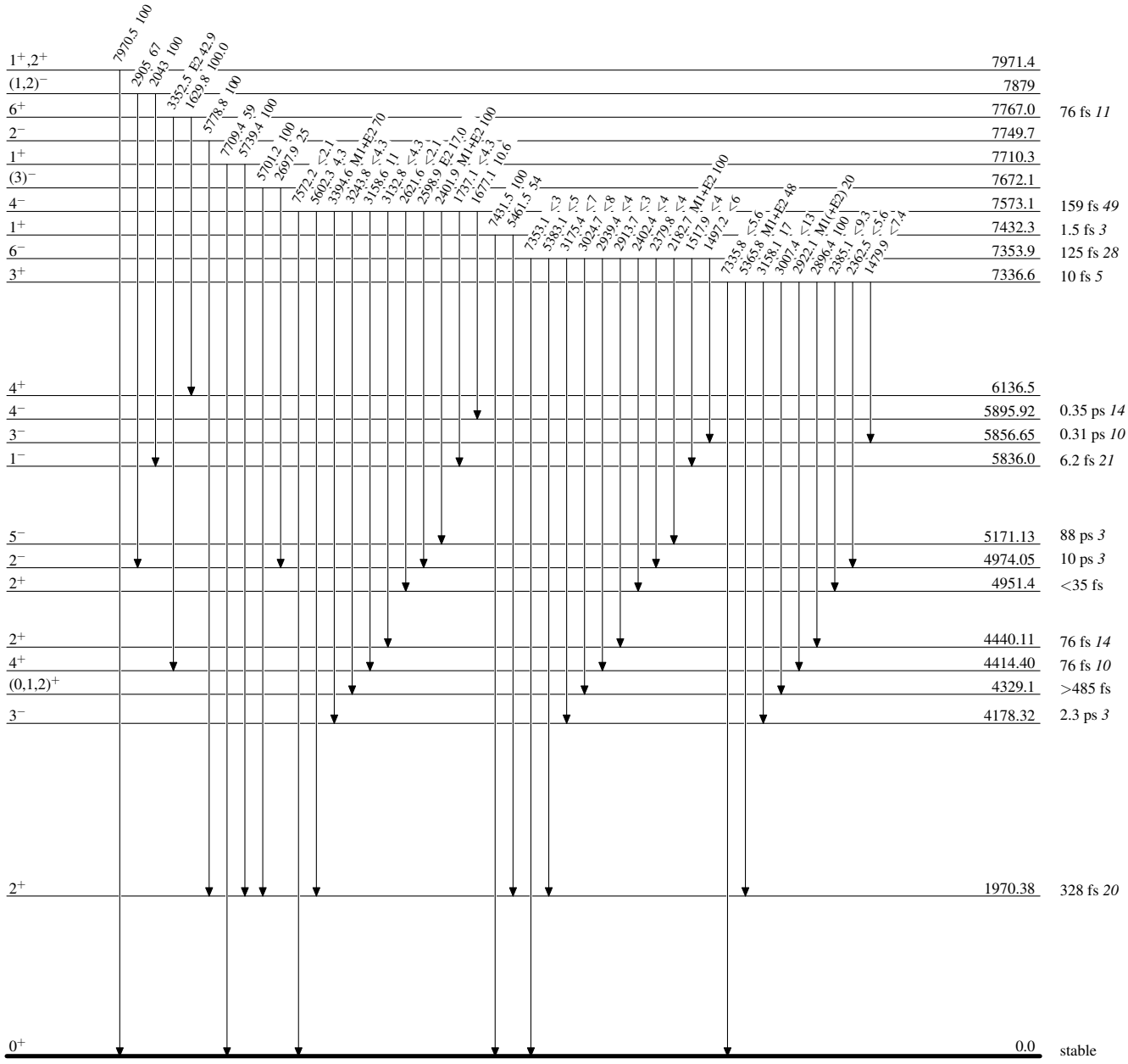


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

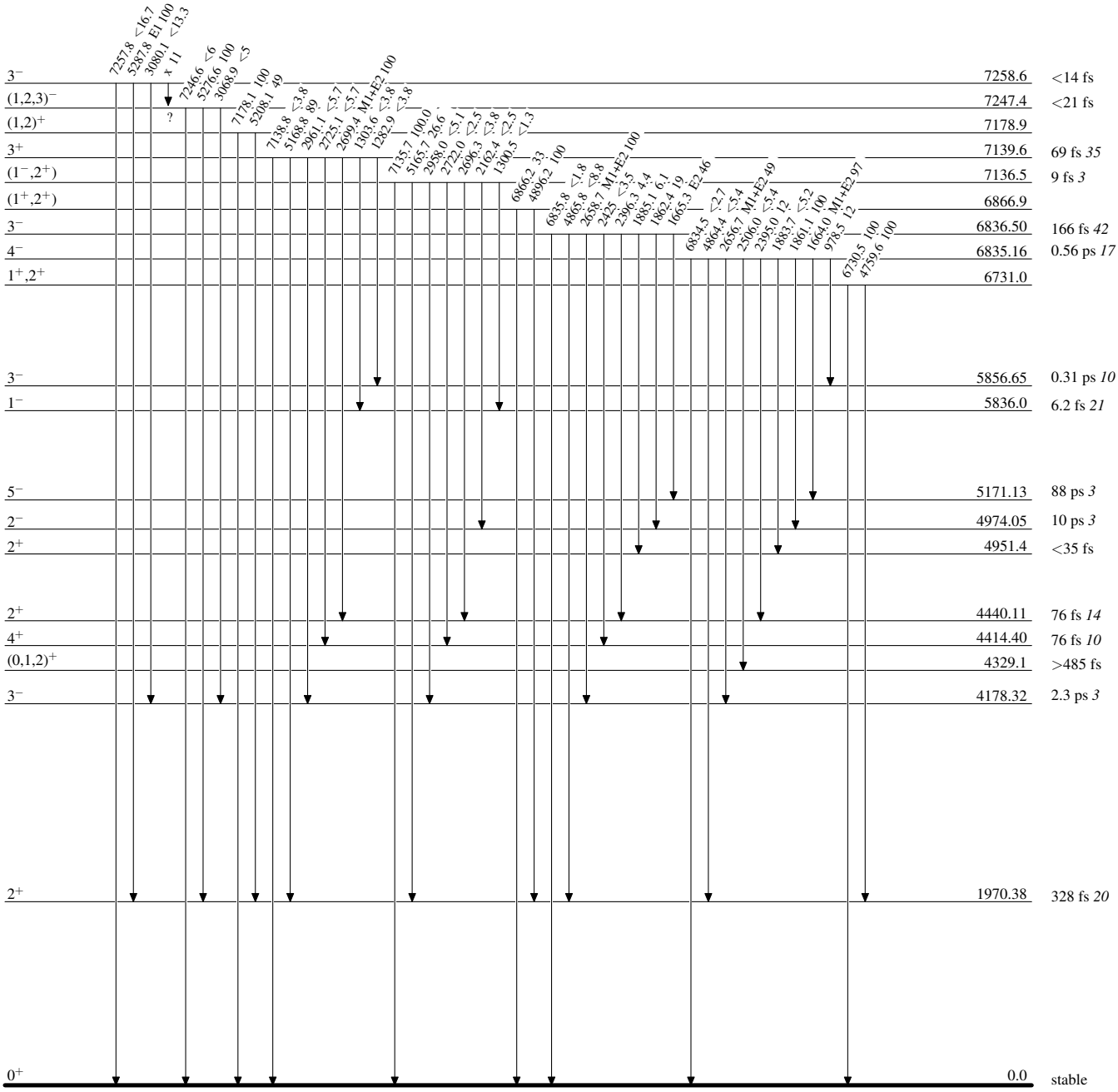


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

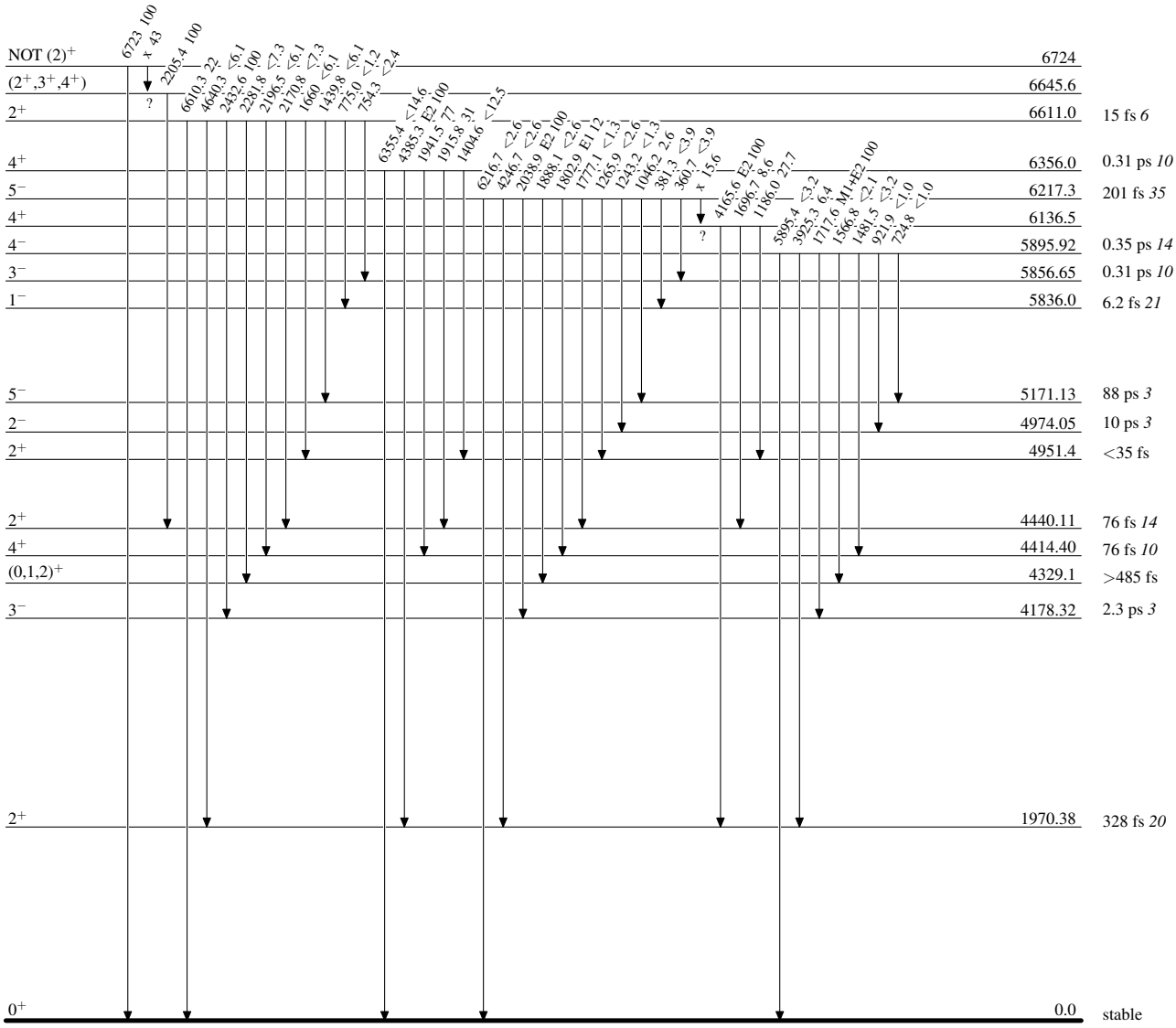


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

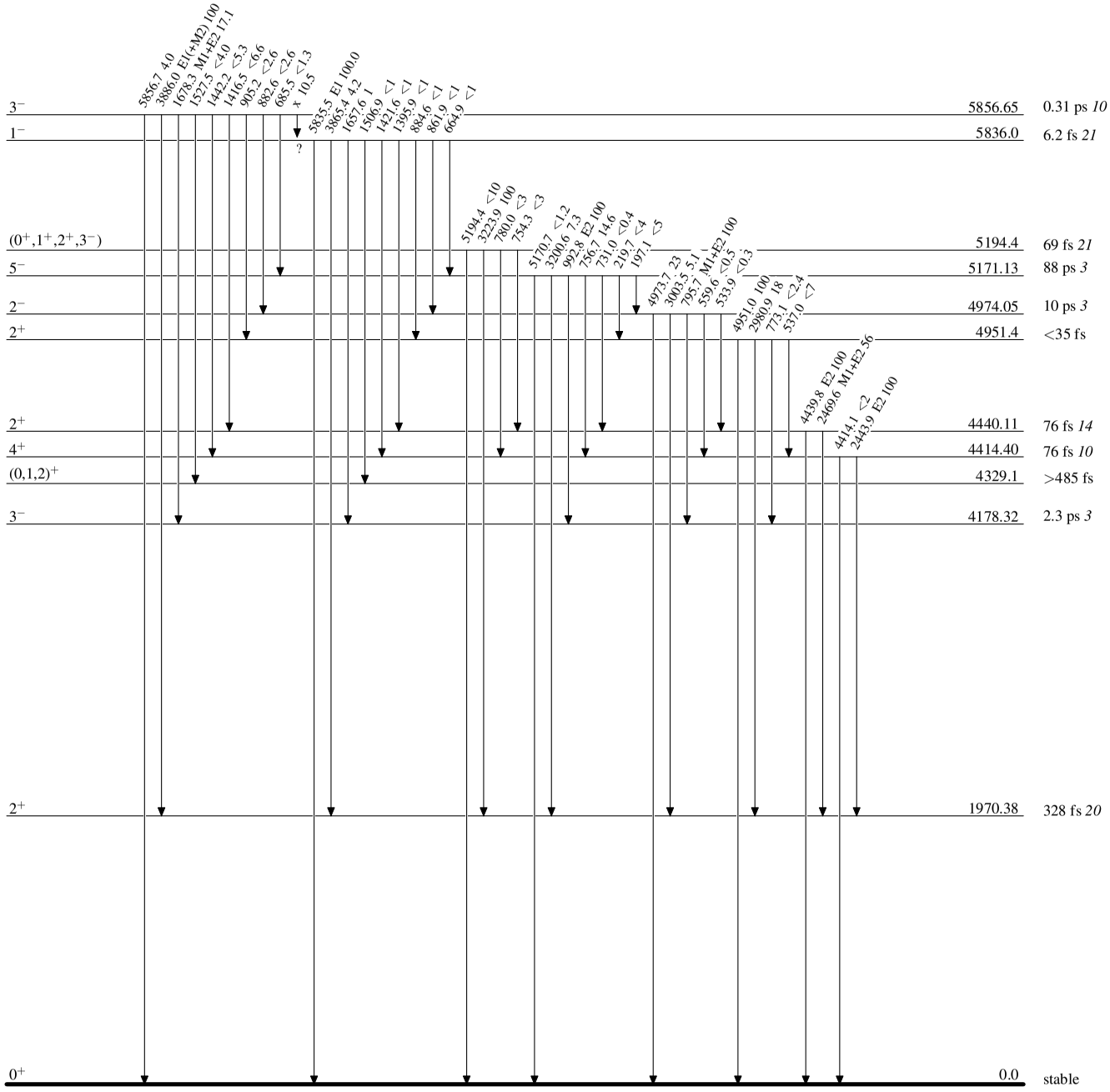


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

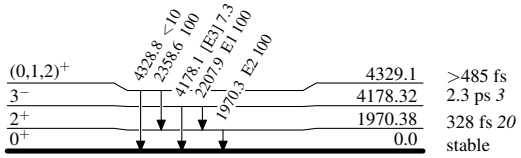


$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

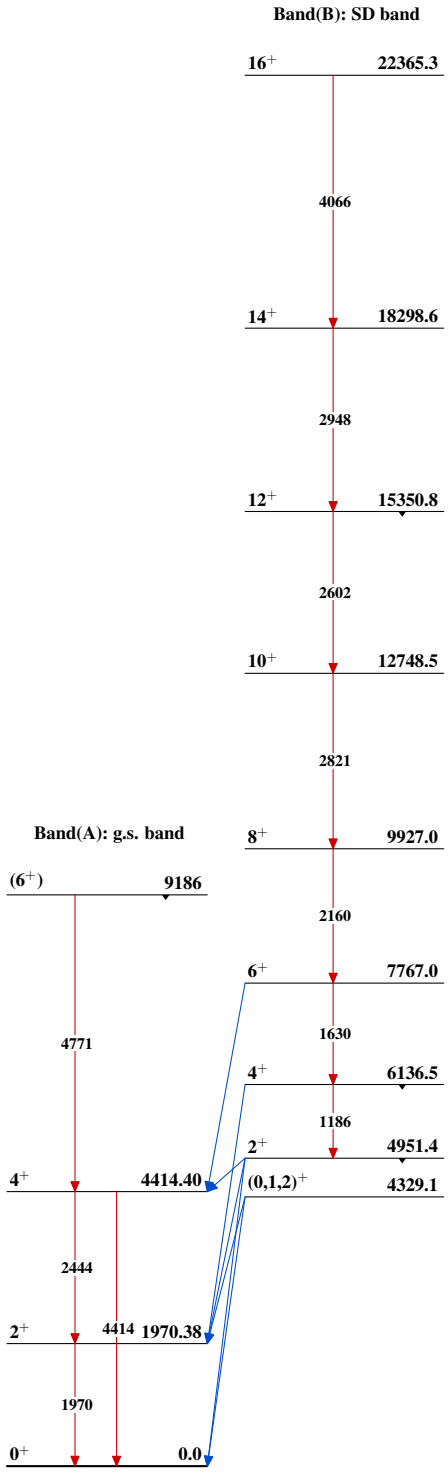
Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas



$^{36}_{18}Ar_{18}$

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 152,1 (2018)	30-Sep-2017

Q(β^-)=−5914.07 *4*; S(n)=11838.47 *28*; S(p)=10242.25 *20*; Q(α)=−7208.05 *20* 2017Wa10
S(2n)=20625.92 *20*, S(2p)=18628.63 *27* (2017Wa10).
Isotope shifts, charge radii measured: 2005Bl33, 2003Sa20, 2000Ga58, 1996Kl04, 1988Mo30, 1986Mu06.
Mass measurement: 2002He23 (Penning-trap method).
Measurement of isotope abundance ratio: 1995Ya15.
Other measurements:
^{40}Ca(^{40}Ca,X) E=50 MeV/nucleon: 2007Fa17: 3-phonon giant resonances. GANIL facility using SPEG spectrometer and INDRA 4π array of CsI(Tl) detectors. Measured γ, protons and α particles from decay of giant resonances. Population of g.s., and levels near 2200 keV and 4000 keV from decay of GQR in ^{40}Ca to ^{38}Ar via two-proton decay.
^{41}Ca(n,α) E=0.6-50 keV: 2007DeZR: measured cross section and Γ.
^{41}Ca(n,α) E<80 keV: 2012Ve01: measured cross section.
Structure calculations (selected references): 2004Sv02 (high-spin levels), 2003Be53 (high-spin levels), 2003Se17 (RPA calculations), 1994Mi19 (levels, moments, etc.), 1970Sk01 (even-parity states).
Calculated M1 strength distributions with large-scale shell-model calculations in *sd* and *pf* shells: 2007Li56 (also 2007Li37).
Comparison of experimental and theoretical g factors: 2007Be42.

^{38}Ar Levels

Cross Reference (XREF) Flags

A	^{38}Cl β^- decay (37.230 min)	M	^{35}Cl(α,pγ)	Y	^{40}Ca(π^-,pnγ)
B	^{38}K ε decay (7.651 min)	N	^{36}Ar(t,p)	Z	^{40}Ca(μ^-,νpnγ)
C	^{38}K ε decay (924.4 ms)	O	^{36}Ar(α,^{2}He)	Others:	
D	^{12}C(^{34}S,^{8}Beγ)	P	^{37}Cl(p,γ):resonances	AA	^{40}Ca(n,^{3}He)
E	^{16}O(^{28}Si,α2pγ)	Q	^{37}Cl(^{3}He,d)	AB	^{40}Ca(P,3pγ)
F	^{24}Mg(^{16}O,2pγ)	R	^{37}Ar(n,n),(n,α):resonances	AC	^{40}Ca(^{14}C,^{16}O)
G	^{24}Mg(^{24}Mg,2α2pγ)	S	^{38}Ar(e,e′)	AD	^{40}Ca(^{18}O,^{20}Ne)
H	^{27}Al(^{14}N,n2pγ)	T	^{39}K(n,d)	AE	^{41}K(p,α)
I	^{27}Al(^{16}O,αpγ)	U	^{39}K(P,2pγ)	AF	^{42}Ca(d,^{6}Li)
J	^{34}S(α,γ):resonances	V	^{39}K(d,^{3}He)	AG	^{42}Ca(^{3}He,^{7}Be)
K	^{34}S(^{7}Li,t)	W	^{39}K(t,α)		
L	^{35}Cl(α,p)	X	^{40}Ar(p,t)		

Isospin T=1 (triplet) states

^{38}Ar	^{38}Ca	ΔE(1)	^{38}K	ΔE(2)
0,0$^+$	0,0$^+$	130,0$^+$ T=1		
2168,2$^+$	2213,2$^+$ +45	2401,2$^+$ T=1	+103,+58	
3378,0$^+$	3084,0$^+$ -294			
3810,3$^-$	3703,3$^-$ -107			
3936,2$^+$	3684,2$^+$ -252			

ΔE(1)=E(^{38}Ca)-E(^{38}Ar)
ΔE(2)=E(^{38}K)-E(^{38}Ar)-130, E(^{38}K)-E(^{38}Ca)-130

Isospin T=2 (quintuplet) states

^{38}Cl	^{38}Ar	ΔE
0,2$^-$	10631,(2$^-$), T=2	
671,5$^-$	11302,5$^-$ & 11308,5$^-$ T=2	+1,+7
755,3$^-$	11351,3$^-$ & 11355,3$^-$ T=2	-34,-30
1309,4$^-$	11928,4$^-$ T=2	-11

ΔE=E(^{38}Ar)-E(^{38}Cl)-10630

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
0.0	0^+	stable	ABCDEFGHIJKLMNOPQ TUVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG J^π: no hyperfine structure observed in optical spectroscopy (1953Me73). $<r^2>^{1/2}$=3.4028 fm *19* (2013An02 evaluation). Additional information 1.
2167.472 *12*	2^+	0.458 ps *21*	AB DEFGHIJ LMNOPQ TUVWXYZ	XREF: Others: AB, AC, AD, AE, AF, AG μ=+0.48 *24* (2006Sp01) E(level): 2167.60 *6* from (p,γ):resonances. J^π: L(t,p)=L(p,t)=2 from 0^+; 2167.4γ E2 to 0^+. $T_{1/2}$: weighted average of 0.492 ps *21* from (^{34}S,^{8}Beγ), 0.444 ps *25* from (^{16}O,αpγ), 0.45 ps *2* from (α,pγ), and 0.37 ps *5* from (p,α). μ: transient magnetic field and DSA in ^{12}C(^{34}S,^{8}Be) reaction (2006Sp01). See also 2014StZZ compilation. Additional information 2.
3376.9 *3*	0^+	22.8 ps *15*	A D H JKLMN PQ V X Z	XREF: Others: AC, AE, AF, AG E(level): 3377.36 *23* from (p,γ):resonances. J^π: L(t,p)=L(p,t)=0 from 0^+; E0 transition to 0^+. $T_{1/2}$: from recoil-distance method in (α,pγ). Other: >0.35 ps in (p,γ):resonances. Additional information 3.
3810.18[b] *3*	3^-	56 fs *14*	AB DEFGHIJ LMNOPQ U WXYZ	XREF: Others: AB, AE, AF, AG XREF: W(3854?). E(level): 3810.09 *11* from (p,γ):resonances. J^π: L(p,t)=3 and L(t,p)=3,4 from 0^+; L(^{3}He,d)=1+3 from $3/2^+$; 1642.7γ ΔJ=1 E1(+M2) to 2^+. $T_{1/2}$: weighted average of 52 fs *14* in (α,pγ) and 74 fs *28* in (p,γ). Additional information 4.
3936.5[@] *4*	2^+	43 fs *5*	AB DE H JKLMN PQ VWXYZ	XREF: Others: AE, AF, AG μ=+2.2 *22* (2006Sp01) XREF: W(3961). E(level): 3936.61 *18* from (p,γ):resonances. J^π: L(t,p)=L(p,t)=2 from 0^+; L(^{3}He,d)=L(d,^{3}He)=0 from $3/2^+$. $T_{1/2}$: weighted average of 47 fs *6* in (^{34}S,^{8}Beγ), 32 fs *13* in (α,pγ), 33 fs *10* in (p,γ) and 54 fs *15* in (α,γ):resonances. μ: transient magnetic field and DSA in ^{12}C(^{34}S,^{8}Be) reaction (2006Sp01). See also 2014StZZ compilation. Additional information 5.
4479.98 *8*	4^-	0.97 ps +*25*–*20*	DEFGHIJ LMN PQ YZ	XREF: Others: AE E(level): 4479.92 *14* from (p,γ):resonances. J^π: L(^{3}He,d)=3 from $3/2^+$; J=4 from $\gamma(\theta)$ in (p,γ):resonances; 669.8γ ΔJ=1 M1(+E2) to 3^-. $T_{1/2}$: weighted average of 0.93 ps *20* in (^{16}O,αpγ) and 1.3 fs +*8*–*3* in (α,pγ). Other: >0.42 ps in (p,γ):resonances. Additional information 6.
4565.5[&] *5*	2^+	36 fs *3*	AB DE J LM PQ VW Z	XREF: Others: AE E(level): 4565.5 *2* from (p,γ):resonances. J^π: 1^+,2^+ from L(d,^{3}He)=L(^{3}He,d)=0 from $3/2^+$; 1^+ is ruled out by 755.3γ to 3^- and RUL. $T_{1/2}$: weighted average of 35 fs *3* in (^{34}S,^{8}Beγ), 51

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				fs *14* in (α,pγ) and 38 fs *11* in (p,γ):resonances. Other: <62 fs in (α,γ):resonances. Additional information 7.
4585.87[b] *8*	5⁻	132 ps *4*	DEFGHI LMNOPQ X Z	XREF: Others: AE E(level): 4585.2 *4* from (p,γ):resonances. Jπ: L(p,t)=5 from 0⁺; L(^{3}He,d)=3 from 3/2⁺; 775.7γ E2 to 3⁻ and 105.9γ M1(+E2) to 4⁻. $T_{1/2}$: weighted average of 136 ps *7* in (^{16}O,2pγ), 130 ps *4* in (^{14}N,n2pγ), 135 ps *4* in (^{16}O,αpγ), and 128 ps *6* in (α,pγ). Other: >0.35 ps in (p,γ):resonances. Additional information 8.
4709.3 *10*	0⁺	1.7 ps *+21−7*	J LMN P XYZ	XREF: Others: AE XREF: X(4730). E(level): 4710.3 *2* from (p,γ):resonances. Jπ: L(t,p)=L(p,t)=0 from 0⁺. $T_{1/2}$: from (α,pγ). Other: >0.42 ps in (p,γ):resonances.
4877.0 *3*	3⁻	34 fs *8*	J LMN PQ W	XREF: Others: AE E(level): 4876.87 *14* from (p,γ):resonances. Jπ: 2709.4γ E1+M2 γ to 2⁺ and 1066.8γ M1(+E2) γ to 3⁻; L(t,p)=3,4 from 0⁺; L(^{3}He,d)=1+3 from 3/2⁺; J=3 from γ(θ) in (p,γ):resonances. $T_{1/2}$: weighted average of 53 fs *14* in (α,pγ) and 31 fs *6* in (p,γ). Additional information 9.
5083.6 *10*	(2)⁻	39 fs *10*	J LMN PQ	XREF: Others: AE E(level): 5084.3 *5* from (p,γ):resonances. Jπ: 1⁻,2⁻,3⁻ from L(^{3}He,d)=1+3 from 3/2⁺; J=2 is proposed in (α,pγ) and (p,γ):resonances. But 1⁻ and 3⁻ are not completely ruled out. $T_{1/2}$: weighted average of 57 fs *21* in (α,pγ) and 35 fs *10* in (p,γ).
5157.3 *2*	2⁺	23 fs *7*	B J LMN PQ VWX Z	XREF: Others: AE XREF: N(5170). Additional information 10. Jπ: L(t,p)=L(p,t)=2 from 0⁺; L(d,^{3}He)=L(^{3}He,d)=0 from 3/2⁺. $T_{1/2}$: weighted average of 28 fs *13* in (α,pγ) and 22 fs *7* in (p,γ):resonances.
5349.4[@] *3*	4⁺	0.14 ps *4*	B E H KLMN P W Z	XREF: Others: AD, AE XREF: W(5376)AD(5400?). E(level): 5349.5 *2* from (p,γ):resonances. Jπ: J=4 from pγ(θ) in (α,pγ); 3182.2γ ΔJ=2 E2 to 2⁺; 1539γ to 3⁻. $T_{1/2}$: weighted average of 0.14 ps *4* in (α,pγ) and 0.15 ps *5* in (p,γ):resonances.
5513.3 *4*	3⁻	0.19 ps *6*	J LMN PQ	XREF: Others: AD, AE XREF: AD(5400?). E(level): 5513.38 *16* from (p,γ):resonances. Jπ: L(t,p)=3,4 from 0⁺; L(^{3}He,d)=1+3 from 3/2⁺. $T_{1/2}$: weighted average of 0.19 ps *6* in (α,pγ) and 0.19 ps *7* in (p,γ).
5552.21 *18*	1⁺,2⁺	11 fs *6*	B J M PQ VW Z	XREF: Others: AE Additional information 11.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				Jπ: L(^{3}He,d)=L(d,^{3}He)=0 from 3/2$^+$. $T_{1/2}$: from (p,γ):resonances. Other: <31 fs in (α,pγ).
5594.6 *6*	2$^+$	60 fs *18*	J N PQ	XREF: Others: AE, AG Additional information 12. Jπ: L(t,p)=2 from 0$^+$; 2217.6γ and 5594.2γ to 0$^+$. L(^{3}He,d)=1+3 from 3/2$^+$ (suggesting 1$^-$,2$^-$,3$^-$) is inconsistent.
5658.61[c] *22*	5$^-$	29 fs *5*	EF H LMNOPQ	XREF: Others: AE E(level): 5658.1 *5* from (p,γ):resonances. Jπ: 1072.8γ ΔJ=0 M1(+E2) to 5$^-$; L(^{3}He,d)=3 from 3/2$^+$. $T_{1/2}$: weighted average of 64 fs *28* in (α,pγ) and 28 fs *4* in (p,γ):resonances. Other: <0.7 ps in ^{27}Al(^{14}N,n2pγ). Additional information 13.
5733.9 *5*	1$^-$	<4 fs	J N PQ W	XREF: Others: AE Additional information 14. Jπ: 1,2$^+$ from 5733γ to 0$^+$ and RUL; 2$^+$ is ruled out by L(^{3}He,d)=1 or 1+3 from 3/2$^+$. But L(t,p)=2 for 5740 group (suggesting 2$^+$) is inconsistent.
5824.9 *2*	3$^-$	0.24 ps *+62−14*	J L N PQ w	XREF: Others: AE, AG Additional information 15. Jπ: L(t,p)=3,4 from 0$^+$; L(^{3}He,d)=1+3 from 3/2$^+$; 3657γ to 2$^+$ and 1345γ to 4$^-$.
5857.5 *2*	(2)$^-$	15.2 fs *35*	L PQ w	XREF: Others: AE Additional information 16. Jπ: L(^{3}He,d)=3 from 3/2$^+$ gives 1$^-$ to 5$^-$; 981γ to 3$^-$ and RUL require ΔJ<2, since ΔJ=2 would require an unreasonably large B(E2) or B(M2) value; 3690γ to 2$^+$ disfavors 4$^-$; J=2 is favored by 5547γ from the 10631,(2$^-$) level with T=(2), possible IAS of ^{38}Cl g.s., J^π=2$^-$. But 3$^-$ is not completely ruled out.
5974.8 *2*	(0$^+$ to 3$^-$)	>1.7 ps	P	XREF: Others: AE Additional information 17. Jπ: 818γ, 1409γ, 2038γ, 3807γ to 2$^+$, 5577.4γ from (1)$^-$.
6041.8 *3*	(3$^-$,4$^+$)	58 fs *12*	LMn P w	XREF: Others: AG Additional information 18. Jπ: 1456γ to 5$^-$, 2232γ to 3$^-$, 5336.9γ from (2$^+$).
6053.2[&] *4*	(4$^+$)	71 fs *14*	E LMn P w	XREF: Others: AE E(level): 6053.1 *3* from (p,γ):resonances. Jπ: (3,4$^+$) from 704γ to 4$^+$, 1573γ to 4$^-$, 1488γ and 2116γ to 2$^+$; (4$^+$) is favored by band structure.
6209.4 *6*	4$^-$	74 fs *23*	l n PQ	XREF: Others: AE E(level): 6210.0 *10* from (p,γ):resonances. Jπ: 1729γ(θ) in (p,γ):resonances gives J=4; L(^{3}He,d)=3 from 3/2$^+$.
6213.8 *3*	(2$^+$)	5.4 fs *31*	J l n P	XREF: Others: AE

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				Additional information 19.
				Jπ: 6213γ to 0^+, 5517.0γ from (4^+); primary 4959γ and 5054γ from 3^- in (p,γ):resonances.
6249.9 *3*	2^+	>111 fs	lM P X	XREF: Others: AE, AG
				XREF: AE(6259).
				Additional information 20.
				Jπ: 901γ to 4^+ and 2873γ to 0^+; primary 4952γ from 1^- in (p,γ):resonances.
6276.1 *4*	4^+	81 fs *35*	l N P X	XREF: Others: AD, AE
				XREF: N(6287)X(6320)AD(6300)AE(6286).
				Additional information 21.
				Jπ: L(p,t)=4 from 0^+; L(t,p)=3,4 from $3/2^+$; 2340γ and 4108γ to 2^+, 927γ to 4^+, 1796γ to 4^-.
6338.6 *5*	$1^-,2^-,3^-$	<13 fs	L PQ	XREF: Others: AE
				XREF: AE(6347).
				Additional information 22.
				Jπ: L(^{3}He,d)=1+3 from $3/2^+$.
6353.5 *4*	1^-	3.6 fs *14*	PQ	XREF: Others: AE
				XREF: AE(6360).
				Additional information 23.
				Jπ: L(^{3}He,d)=1+3 from $3/2^+$ gives $1^-,2^-,3^-$; 6353γ to 0^+ and RUL rules out 2^- and 3^-.
6408.32 *10*	6^+	1.0 ps *3*	EFGH LMNOP	XREF: Others: AE
				XREF: AE(6420).
				Jπ: J=6 from γ(θ) in (^{16}O,2pγ) and (^{14}N,n2pγ); 1822γ ΔJ=1 E1(+M2) to 5^-.
				$T_{1/2}$: from ^{24}Mg(^{16}O,2pγ). Other: <1.4 ps from ^{27}Al(^{14}N,n2pγ).
6476.6 *19*	(0^+ to 3^-)	>0.17 ps	l n Pq	XREF: Others: AE
				Additional information 24.
				Jπ: 1911γ to 2^+; primary 4725γ from 1^- in (p,γ):resonances.
6485.4 *7*	$(1^-,2,3^-)$	29 fs *22*	J l n Pq	XREF: Others: AE
				Additional information 25.
				Jπ: 4318γ to 2^+, 2675γ to 3^-, 4829γ from 1^-. L(^{3}He,d)=1 for 6486 *10* group gives $(0,1,2,3)^-$ for any of the three levels near this energy.
6495.8 *3*	$(2^-,3^-)$	10 fs *4*	Pq	XREF: Others: AE
				Additional information 26.
				Jπ: 2016γ to 4^-, 2559γ to 2^+, 5056.4γ from $(1)^-$.
6520	2^+		X	Jπ: L(p,t)=2 from 0^+.
6574.3 *5*	1^-	<3.5 fs	N PQ	XREF: Others: AE
				XREF: AE(6590).
				Additional information 27.
				Jπ: L(^{3}He,d)=1 or 1+3 from $3/2^+$; 6574γ to 0^+ and RUL. But L(t,p)=3,4 is inconsistent with 1^-.
6601.59 *23*	4^-	12.5 fs *21*	J lM PQ	XREF: Others: AE
				XREF: Q(6593)AE(6610).
				E(level): 6601.18 *19* from (p,γ):resonances.
				Jπ: 2122γ ΔJ=0 M1(+E2) to 4^-; L(^{3}He,d)=3.
6621.6 *4*	$(1^-,2,3^-)$	36 fs *12*	l PQ	XREF: Others: AE
				XREF: Q(6611)AE(6630).
				Additional information 28.
				Jπ: 2056γ to 2^+, 2811γ to 3^-, 4930.7γ from $(1)^-$. L(^{3}He,d)=(2) from $3/2^+$ suggests π=+.
6674.4 *3*	5^-	13.7 fs *35*	EF lMn PQ	XREF: Others: AE

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				XREF: ae(6680). E(level): 6673.5 *6* from (p,γ):resonances. Jπ: 2089γ ΔJ=0 to 5⁻; L(^{3}He,d)=3 from 3/2⁺.
6681.6 *5*	(0,1,2)	53 fs *19*	n P	XREF: Others: AE XREF: ae(6680). Additional information 29. Jπ: 948γ to 1⁻ and RUL requires ΔJ<2.
6772.7 *5*	1⁻	<2.8 fs	PQ	XREF: Others: AE Additional information 30. Jπ: 6772γ to 0⁺ gives (1,2⁺); L(^{3}He,d)=1 from 3/2⁺ and RUL rules out 1⁺ and 2⁺.
6824.0 *15*	(2⁺,3⁻)	17 fs *6*	n Pq	XREF: Others: AE Additional information 31. E(level): unresolved doublet at 6824 keV in (p,γ):resonances. Jπ: 4656γ to 2⁺, 3014γ to 3⁻, 4728.3γ from (1)⁻, 4906.9γ from (4⁺); L(^{3}He,d)=1 suggests (0 to 3)⁻ for 6824.0 and/or 6824.1.
6824.1 *15*	(0⁺ to 4⁺)		n Pq	XREF: Others: AE Additional information 32. E(level): unresolved doublet at 6824 keV in (p,γ):resonances. Jπ: 2888γ to 2⁺. L(t,p)=2 for a 6838 *15* group suggests 2⁺ for any of the levels from 6824 to 6852.
6846 *2*	(0⁻ to 4⁻)		Mn	XREF: Others: AE E(level): from (α,pγ). Jπ: 1762γ to (2)⁻.
6852 *1*	(1,2⁺)		Mn P	XREF: Others: AE E(level): from (α,pγ). Jπ: 3475γ to 0⁺.
6869.9 *5*	(2⁻,3,4⁺)		LM P	XREF: Others: AE Additional information 33. Jπ: 4702γ to 2⁺, 1993γ to 3⁻, 5057.7γ from 4⁻.
6903.8 *9*	2⁻,3⁻	6.2 fs *21*	M PQ	XREF: Others: AE Additional information 34. Jπ: L(^{3}He,d)=1+3 from 3/2⁺; 2967γ to 2⁺ and 2424γ to 4⁻.
6947.9 *9*	(2⁺)		MN P	Additional information 35. Jπ: 3571γ to 0⁺; L(t,p)=(2) from 0⁺.
7046 *2*	(3⁻,4⁺)		LM P	E(level): weighted average of 7047 *2* from (α,pγ) and 7045 *2* from (p,γ):resonances. Jπ: 4878γ to 2⁺, 2566γ to 4⁻; primary γ 4256 from 5⁻ in (p,γ):resonances.
7060 *15*	0⁺		l N	XREF: l(7070). E(level): from (t,p). Jπ: L(t,p)=0 from 0⁺.
7070.19 *24*	(6)⁻	51 fs *14*	EF lM	Jπ: 2483.9γ M1+E2 to 5⁻ and 437.8γ from 7⁻ favors J^π(7070)=6⁻. Assignment of J^π=5⁻ from γ(θ) and RUL in (α,pγ) is inconsistent with J^π=6⁻ from γ(DCO) in (^{28}Si,α2pγ). It should be noted that 2483.9γ(DCO) in (^{28}Si,α2pγ) are also marginally consistent with ΔJ=0 giving 5⁻ as in (α,pγ) and also with ΔJ=2 giving 7⁻, the latter ruled out by 2590γ to 4⁻ and RUL. In the opinion

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				of the evaluator, the spin of this level needs reinvestigation. Here the evaluator have adopted $J^\pi=(6)^-$, but $J^\pi=5^-$ can not be ruled out.
				$T_{1/2}$: from (α,pγ).
7100.8 *5*	(1^- to 4^+)	12 fs *5*	lM P v	XREF: l(7070)v(7120).
				Additional information 36.
				J^π: 4933γ to 2^+, 4072γ from 3^-. L(d,^{3}He)=2 gives 0^+,1^+,2^+,3^+ for 7100.8 and/or 7128.
7128 *1*	(1^- to 4^+)		M v	XREF: v(7120).
				E(level): from (α,pγ).
				J^π: 4960γ to 2^+ and 3318γ to 3^-.
7181 *2*	($1,2^+$)		lM	XREF: l(7192).
				E(level): from (α,pγ).
				J^π: 7180γ to 0^+.
7192.2 *5*	(2^-,3,4)		lM P	Additional information 37.
				J^π: 2315γ to 3^-, 2712γ to 4^-, 4319.2γ from (2).
7233.8 *17*	(1^- to 4^+)		M P	E(level): weighted average of 7235 *2* from (α,pγ) and 7233.0 *17* from (p,γ):resonances.
				J^π: 5066γ to 2^+, 4189.9γ from (3^-).
7236 *2*	(2^+)		MN P	XREF: N(7249).
				E(level): weighted average of 7234 *2* from (α,pγ) and 7238 *2* from (p,γ):resonances.
				J^π: 7235γ to 0^+; L(t,p)=2 from 0^+ for a level at 7249.
7288.32[@] *24*	6^+	27 fs *13*	E KlM P	J^π: 1939.4γ ΔJ=2 E2 to 4^+; 879.9γ to 6^+ and 2704γ to 5^-.
				$T_{1/2}$: weighted average of 53 fs *20* in (α,pγ) and 21 fs *10* in (p,γ):resonances.
7289.6 *8*	(3^-,4^+)	>55 fs	lMN P	XREF: N(7306).
				Additional information 38.
				J^π: L(t,p)=3,4 from 0^+ for a level at 7306.
7334 *2*	(1^- to 4^+)		Mn P	E(level): weighted average of 7335 *1* from (α,pγ), 7336 *15* from (t,p), and 7329 *2* from (p,γ):resonances.
				J^π: 3524γ to 3^- and 5166γ to 2^+.
7350 *1*	(3^-,4^+)		LMn P	XREF: n(7336).
				E(level): from (α,pγ).
				J^π: 1100γ to 2^+ and 2764γ to 5^-.
7365 *2*			P	Additional information 39.
7370 *2*	(1^+)		M P S	XREF: S(7381).
				Additional information 40.
				J^π: 7369γ to 0^+; M1 excitation in (e,e′) for a level at 7381.
7376 *1*	(2^+,3,4^+)		M	J^π: 1126γ to 2^+ and 2027γ to 4^+.
7431.0 *3*	(2^-,3,4^+)	13 fs *8*	M P	Additional information 41.
				J^π: 5263γ to 2^+; primary 3742γ and 4375γ from 3^- and weak 4497γ from 4^-.
7452 *2*	(1^- to 4^+)		LM P	E(level): weighted average of 7452 *2* from (α,pγ) and 7451 *2* from (p,γ):resonances.
				J^π: 2575γ to 3^- and 5284γ to 2^+.
7485 *3*	(3^-,4^+)		MN	E(level): from (α,pγ).
				J^π: 1826γ to 5^-; L(t,p)=3,4 from 0^+.
7491.3[&] *5*	(6^+)		E	J^π: 1833γ to 5^-, 2142γ to 4^+; 2046γ from $8^{(+)}$; band member.
7497 *1*	($3,4,5^-$)		J M P	XREF: P(?).

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				E(level): from (α,pγ). Jπ: 3017γ to 4⁻, 3687γ to 3⁻ and 1444γ to (4⁺).
7508.12[b] *22*	7⁻	≥42 fs	EF H LM	Jπ: 2922.6γ ΔJ=2 E2 γ to 5⁻; 1100γ to 6⁺. $T_{1/2}$: from (α,pγ); <1.4 ps in ^{27}Al(^{14}N,n2pγ).
7528 *2*	(3⁻ to 7⁻)		Mn	XREF: n(7544). E(level): from (α,pγ). Jπ: 1869γ and 2942γ to 5⁻.
7539 *2*	(3,4,5)	43 fs *24*	Mn P	E(level): weighted average of 7539 *2* from (α,pγ), 7544 *15* from (t,p), and 7538 *2* from (p,γ):resonances. Jπ: 1486γ to (4⁺) and 3059γ to 4⁻.
7628? *8*	(1,2⁺)		J	Jπ: 7628γ to 0⁺.
7648? *8*	(1,2⁺)		J	Jπ: 7648γ to 0⁺.
7663 *2*	(2⁺ to 6⁺)		M	E(level): from (α,pγ). Jπ: 2314γ to 4⁺.
7667 *1*	(3⁻ to 7⁻)		M	E(level): from (α,pγ). Jπ: 2008γ to 5⁻.
7683 *2*	(3⁻,4⁺)	10 fs *6*	LMN P	XREF: N(7700). E(level): weighted average of 7684 *2* from (α,pγ) and 7681 *2* from (p,γ):resonances. Jπ: 3203γ to 4⁻ and 5515γ to 2⁺; L(t,p)=(3,4) from 0⁺ for a level at 7700.
7702 *1*	(1⁺)		M S	XREF: S(7721). Jπ: 7701γ to 0⁺; M1 excitation in (e,e′).
7786 *1*	(2⁻ to 6⁻)		M	Jπ: 3306γ to 4⁻.
7828 *2*	(1⁻ to 5⁻)		M	Jπ: 4018γ to 3⁻.
7857 *2*	(1⁻,2⁺)		lMn	E(level): from (α,pγ). Jπ: 4047γ to 3⁻ and 7856γ to 0⁺.
7858.9 *5*	(6)		E lMn	Jπ: 1184.5γ ΔJ=1 d to 5⁻.
7893.4 *13*	(1⁺,2⁺)	<3.5 fs	lM P S	XREF: S(7877). Additional information 42. Jπ: 7893γ to 0⁺; M1,E2 excitation in (e,e′).
7899 *2*	(3⁻ to 7⁻)		lM	E(level): from (α,pγ). Jπ: 1225γ to 5⁻.
7911 *1*	(3⁻,4⁺)		MN	XREF: N(7920). E(level): from (α,pγ). Jπ: γ′s to 2⁺ and 5⁻; L(t,p)=(3,4) from 0⁺ for a level at 7920.
7992 *2*	(1⁻,2,3⁻)	<4 fs	J M P	E(level): from (α,pγ) and (p,γ):resonances. Jπ: 5824γ to 2⁺; primary 2405γ and 3210γ from 1⁻, 3358γ from 3⁻ in (p,γ):resonances. $T_{1/2}$: from (α,γ):resonances (1981BuZY).
8068 *1*	(3⁻,4⁺)		lMN	XREF: N(8050). E(level): from (α,pγ). Jπ: 4258γ to 3⁻; L(t,p)=3,4 from 0⁺ for a group at 8050.
8077.20 *22*	7⁺	0.11 ps *3*	EF H lM	Jπ: 1669.0γ ΔJ=1 M1+E2 γ to 6⁺; 492.6γ M1(+E2) from 8⁺. $T_{1/2}$: from (α,pγ).
8106 *2*	(0⁺ to 4⁺)		Mn	E(level): from (α,pγ). Jπ: 5938γ to 2⁺.
8124 *1*	(3⁻ to 6⁺)		Mn	XREF: n(8111). E(level): from (α,pγ). Jπ: 2774γ to 4⁺ and 3538γ to 5⁻.
8125.0[a] *4*	(6⁻)		E M	Jπ: 1055γ ΔJ=(0) (M1+E2) to (6)⁻.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	T1/2[#]	XREF	Comments
8181 *2*	(3⁻,4⁺)		MN	E(level): from (α,pγ). Jπ: 6013γ to 2⁺; L(t,p)=3,4 from 0⁺ for a 8185 group.
8215 *2*	(3⁻ to 7⁻)		M	E(level): from (α,pγ). Jπ: 2556γ to 5⁻.
8233 *2*	(1⁻)		LMn S	XREF: S(8240). E(level): from (α,pγ). Jπ: 8232γ to 0⁺; E1 excitation in (e,e′).
8261 *2*	(3⁻ to 6⁻)		Mn	E(level): from (α,pγ). Jπ: 3781γ to 4⁻ and 2602γ to 5⁻.
8311 *2*	(1⁺)		M S	E(level): from (α,pγ). Jπ: 6143γ to 2⁺ and 4501γ to 3⁻; 1⁺ is suggested by M1 excitation in (e,e′).
8353 *3*	(1,2⁺)		lM	XREF: l(8370). E(level): from (α,pγ). Jπ: 8352γ to 0⁺.
8391 *2*	(2⁺)		lMN S	XREF: l(8370)N(8405)S(8409). E(level): from (α,pγ). Jπ: 8390γ to 0⁺; E2 excitation in (e,e′).
8417 *2*	(3⁻ to 7⁻)		Mn	XREF: n(8405). E(level): from (α,pγ). Jπ: 2758γ to 5⁻.
8481 *2*	(3⁻ to 6⁻)		M	E(level): from (α,pγ). Jπ: 3895γ to 5⁻ and 4001γ to 4⁻.
8491.1 *4*	(6⁻)		EF LM	Jπ: (5,7) is assigned in (α,pγ) based on an assignment of J^{π}(7070)=5⁻ 1421γ(θ) to 7070 level which is consistent with ΔJ=0 or 2 and 1421γ(DCO) in (^{28}Si,α2pγ) is consistent ΔJ=1, but for large D+Q admixture, it can also be consistent with ΔJ=0. The evaluator has adopted ΔJ=0 for 1421γ to 7070 level and assigned J^{π}(8491)=(6⁻) based on J^{π}(7070)=(6)⁻ not 5⁻ (see comment there).
8517 *2*	(1,2⁺)		lMn	E(level): from (α,pγ). Jπ: 8516γ to 0⁺.
8520 *3*	(3⁻ to 6⁻)		lMn	E(level): from (α,pγ). Jπ: 4040γ to 4⁻ and 3934γ to 5⁻.
8569.59 *19*	8⁺	<0.6 ps	EF H M	Jπ: 2161.0γ ΔJ=2 E2 to 6⁺, 1061.4γ to 7⁻. Additional information 43. T1/2: from ^{24}Mg(^{16}O,2pγ).
8595 *2*	(3⁻ to 7⁻)		M	E(level): from (α,pγ). Jπ: 2936γ and 4009γ to 5⁻.
8650 *2*	(3⁻ to 6⁺)		M	E(level): from (α,pγ). Jπ: 2991γ to 5⁻ and 2597γ to (4⁺).
8668 *4*	2⁺		MN	XREF: N(8680). E(level): from (α,pγ). Jπ: L(t,p)=2 from 0⁺; 3791γ to 3⁻.
8783 *2*	(3⁻ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 3124γ to 5⁻.
8789 *3*	(4⁻ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 2115γ to 5⁻ and 1719γ (6)⁻.
8800 *2*	(2⁻ to 6⁻)	<3.5 fs	lMn P	E(level): from (α,pγ). Jπ: primary 3128γ from 4⁻.
8809 *2*	(4⁺ to 8⁺)		lMn	E(level): from (α,pγ). Jπ: 2401γ to 6⁺.
8828 *2*	(3⁻ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 4242γ to 5⁻.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
8875 *4*	(3⁻ to 6⁻)		M X	E(level): from (α,pγ). Jπ: 4395γ to 4⁻, 3216γ and 4289γ to 5⁻.
8944 *2*	(4⁺ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 3285γ to 5⁻ and 2536γ to 6⁺.
8956 *2*	(4⁻ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 4370γ to 5⁻ and 1886γ to (6)⁻.
8972.85[c] *21*	7⁻	<28 fs	EF H LM	Jπ: 4386.2γ ΔJ=2 E2 to 5⁻, 2564.4γ E1+M2 to 6⁺. $T_{1/2}$: <28 fs from DSAM for 4386γ in ^{35}Cl(α,pγ) (1976Gl10). Other: 4.2 ps *14* for 2564γ in ^{27}Al(^{16}O,αpγ) (1976Ko10) is discrepant, where the 2564γ was placed from 10174 level. Reversed ordering (proposed by 1976Gl10) of the 1201-2564 cascade defined a level at 8973 instead of 7610.
8998 *2*	(4⁺,5,6⁻)		MN P	XREF: N(9029). E(level): from (α,pγ). Jπ: 2590γ to 6⁺ and primary 2930γ from 4⁻ in (p,γ):resonances.
9072 *2*	(4⁻,5,6⁺)		Mn	XREF: n(9100). E(level): from (α,pγ). Jπ: γ's to (5)⁻, (6)⁻ and (3⁻,4⁺).
9077 *2*	(1⁻ to 5⁻)		Mn	XREF: n(9100). E(level): from (α,pγ). Jπ: 4200γ to 3⁻.
9087 *3*	(3⁻ to 7⁻)		Mn	XREF: n(9100). E(level): from (α,pγ). Jπ: 3428γ and 4501γ to 5⁻.
9100 *2*	(1,2⁺)		Mn	E(level): from (α,pγ). Jπ: 9099γ to 0⁺.
9158 *2*	(0⁺ to 4⁺)		M	E(level): from (α,pγ). Jπ: 6990γ to 2⁺.
9170 *2*	(3⁻ to 6⁻)		MN	E(level): from (α,pγ). Jπ: 4690γ to 4⁻ and 4584γ to 5⁻.
9199 *3*	(4⁻ to 8⁻)		M	E(level): from (α,pγ). Jπ: 1074γ to (6⁻).
9204 *4*	(0⁺ to 4⁺)		M	E(level): from (α,pγ). Jπ: 7036γ to 2⁺.
9260 *4*	(0⁺ to 4⁺)		M	E(level): from (α,pγ). Jπ: 7092γ to 2⁺.
9293 *2*	(3⁻ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 4707γ to 5⁻.
9300 *4*	(0⁺ to 4⁺)		Mn	E(level): from (α,pγ). Jπ: 7132γ to 2⁺.
9330 *2*	(4⁺ to 8⁺)		M	E(level): from (α,pγ). Jπ: 2922γ to 6⁺.
9339.2[@] *4*	8⁺	73 fs *17*	E KlM	Jπ: 2051.3γ ΔJ=2 E2 to 6⁺, 835.3γ from 9⁻; band member. $T_{1/2}$: from (α,pγ).
9349.6 *11*	(7⁻)		E lM	Jπ: γ's to 5⁻ and 6⁺.
9374 *2*	(3⁻ to 7⁻)		MN	XREF: N(9401). E(level): from (α,pγ). Jπ: 4788γ to 5⁻.
9431	(1⁺)		S	E(level): from (e,e′). Jπ: M1 excitation in (e,e′).
9437 *2*	(3⁻ to 7⁻)		MN	E(level): from (α,pγ). Jπ: 3778γ to 5⁻.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
9460 *2*	(3⁻ to 7⁻)		MN	XREF: N(9481). E(level): from (α,pγ). Jπ: 4874γ to 5⁻.
9535 *20*	2⁺		N	Jπ: L(t,p)=2 from 0⁺.
9537.0[&] *4*	8(+)		E LM	Additional information 44. Jπ: 967.4γ ΔJ=0 d to 8⁺, 2248γ and 3128γ to 6⁺; band member.
9597 *5*	1⁻		J S	XREF: S(9603). Jπ: 9596γ ΔJ=1 d to 0⁺; E1 excitation in (e,e′).
9644 *2*	(5⁻ to 9⁻)		Mn	XREF: n(9623). E(level): from (α,pγ). Jπ: 2136γ to 7⁻.
9645	(1⁻)		n S	XREF: n(9623). Jπ: E1 excitation in (e,e′).
9647 *2*	(2⁻ to 6⁻)		Mn	XREF: n(9623). E(level): from (α,pγ). Jπ: 3045γ to 4⁻.
9655 *2*	(3⁻ to 7⁻)		M	E(level): from (α,pγ). Jπ: 3996γ to 5⁻.
9669 *2*	(3⁻ to 7⁻)		M	E(level): from (α,pγ). Jπ: 4010γ to 5⁻.
9689 *5*	1⁻		J	Jπ: 9688γ D to 0⁺ and 5752γ D(+Q) to 2⁺; π=natural for resonant states in (α,γ):resonances.
9720 *20*	2⁺		N	Jπ: L(t,p)=2 from 0⁺.
9797 *5*	3⁻		J N	XREF: N(9770). Jπ: spin from γ(θ) in (α,γ):resonances, π=natural for resonant states.
9811 *5*	1⁻		J	Jπ: spin from γ(θ) in (α,γ):resonances, π=natural for resonant states.
9829 *2*	(4⁻ to 8⁻)		M	E(level): from (α,pγ). Jπ: 2759γ to (6)⁻.
9894 *5*	2⁺		J N	XREF: N(9863). Jπ: 9893γ ΔJ=2 to 0⁺, π=natural for resonant states in (α,γ):resonances.
9917 *5*	1⁻	12 fs *10*	J	Jπ: 9916γ D to 0⁺, π=natural in (α,γ):resonances. $T_{1/2}$: DSAM in (α,γ) (1981BuZY).
9923 *20*	(3⁻,4⁺)		N	Jπ: L(t,p)=3,4 from 0⁺.
9934.0 *8*	(9⁺)		E LM	Jπ: 1364γ ΔJ=1 γ to 8⁺.
9951 *5*	2⁺		J	Jπ: spin from γ(θ) in (α,γ):resonances, π=natural for resonant states.
9996 *5*	1⁻		J N	XREF: N(10003). Jπ: 9995γ D to 0⁺, π=natural for resonant states in (α,γ):resonances.
10024.9[a] *5*	(8⁻)		E M	Jπ: 1900γ ΔJ=2 to (6⁻), 1948γ to 7⁺; band member.
10034 *5*	1⁻		J	Jπ: 10034γ D to 0⁺, π=natural for resonant states in (α,γ):resonances.
10047 *5*	(1⁻)		J n S	XREF: S(10058). Jπ: E1 excitation in (e,e′); 5481γ to 2⁺.
10067 *5*	3⁻		J n	Jπ: spin from γ(θ) in (α,γ):resonances, π=natural for resonant states.
10101 *2*	(3⁻ to 7⁻)		Mn	E(level): from (α,pγ). Jπ: 4452γ and 5515γ to 5⁻.
10112 *2*	(4⁺ to 8⁺)		Mn	E(level): from (α,pγ). Jπ: 3703γ to 6⁺; L(t,p)=3,4 for a 10100 *20* group.
10118	(1⁻)		S	Jπ: E1 excitation in (e,e′).

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	T$_{1/2}$[#]	XREF	Comments
10120 *2*	(6,7,8)		M	E(level): from (α,pγ). Jπ: 2612γ to 7⁻ and 2043γ to 7⁺.
10135 *2*	(5⁻ to 9⁻)		M	E(level): from (α,pγ). Jπ: 2627γ to 7⁻.
10146 *10*	2⁺		J	Jπ: 10146γ ΔJ=2 to 0⁺, π=natural for resonant states in (α,γ):resonances.
10170 *5*	3⁻		J l N	XREF: N(10182). Jπ: spin from γ(θ) in (α,γ):resonances, π=natural for resonant states.
10174.29[c] *21*	9⁻	2.8 ps *5*	EF HI lM	Jπ: 1201.32γ ΔJ=2 E2 to 7⁻, 1604.67γ ΔJ=1 E1+M2 γ to 8⁺. Additional information 45. T$_{1/2}$: weighted average of 4.6 ps *14* from (^{14}N,n2pγ) and 2.6 ps *4* from (^{16}O,2pγ).
10181 *2*	(5⁻ to 9⁻)		M	E(level): from (α,pγ). Jπ: 2673γ to 7⁻.
10182 *20*	(3⁻,4⁺)		N	Jπ: L(t,p)=3,4 from 0⁺.
10184 *5*	1⁻	19 fs *10*	J	Jπ: 10183γ D to 0⁺, π=natural for resonant states in (α,γ):resonances. T$_{1/2}$: DSAM in (α,γ):resonances (1981BuZY).
10.2×10^3 *1*	(2⁺)		K	Jπ: L(^{3}He,t)=2 from 0⁺.
10207	(1⁺)		S	Jπ: M1 excitation in (e,e′).
10217 *5*	(0⁺ to 4⁺)		J	Jπ: 5651γ to 2⁺.
10245 *2*	(5⁻ to 8⁻)		M	E(level): from (α,pγ). Jπ: 2737γ to 7⁻, 1754γ to (6⁻).
10245 *10*	(0⁺ to 4⁺)		J	Jπ: 6308γ and 8077γ to 2⁺.
10255 *5*	1⁻		J	Jπ: 10254γ D to 0⁺, π=natural for resonant states in (α,γ):resonances.
10274 *2*	(4⁺ to 8⁺)		M	E(level): from (α,pγ). Jπ: 2986γ to 6⁺.
10316 *2*	(3⁻ to 7⁻)		M	E(level): from (α,pγ). Jπ: 5730γ to 5⁻.
10335 *5*	1⁻		J	Jπ: 10333γ D to 0⁺, π=natural for resonant states in (α,γ):resonances.
10382 *5*	(1⁻ to 4⁺)		J	Jπ: 6571γ to 3⁻ and 8214γ to 2⁺.
10398 *4*	1⁻	12 fs *11*	J n	E(level): 10393 *5* from (α,γ):resonances. Jπ: 10400γ D to 0⁺, π=natural for resonant states in (α,γ):resonances. T$_{1/2}$: DSAM in (α,γ) (1981BuZY).
10431 *5*	1⁻	26 fs *12*	J n	Jπ: 10429γ D to 0⁺, π=natural for resonant states in (α,γ):resonances. T$_{1/2}$: DSAM in (α,γ) (1981BuZY).
10443 *2*	(4⁺ to 8⁺)		Mn	E(level): from (α,pγ). Jπ: 3155γ to 6⁺.
10455 *2*	(5⁻ to 8⁺)		LM	E(level): from (α,pγ). Jπ: 2947γ to 7⁻ and 4046 to 6⁺.
10494 *5*	1⁻		J	Jπ: spin=1 from γ(θ) in (α,γ):resonances, π=natural for resonant states.
10495	(1⁺)		S	Jπ: M1 excitation in (e,e′).
10507 *5*	(1,2⁺)		J	Jπ: 10505γ to 0⁺.
10516 *5*	(0⁺)		J N	XREF: N(10510). Jπ: L(t,p)=(0) from 0⁺.
10547 *5*	(0⁺)		J N	XREF: N(10550). Jπ: L(t,p)=(0) from 0⁺.
10557 *2*	(5⁻ to 9⁻)		M	Jπ: 3049γ to 7⁻.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
10587 *5*	1^-	18 fs *11*	J n	XREF: n(10595). Jπ: 10585γ D to 0^+, π=natural in (α,γ):resonances. $T_{1/2}$: DSAM in (α,γ):resonances (1981BuZY).
10589 *2*	(4^+ to 7^-)		Mn	XREF: n(10595). E(level): from (α,pγ). Jπ: 6003γ to 5^- and 4180γ 6^+.
10611 *5*	(1^- to 4^+)		J n	XREF: n(10595). Jπ: 5453γ to 2^+ and 5097γ to 3^-. E(level): triplet.
10631.3 *20*	(2^-)		l PQ	Jπ: 4774γ and 5547γ to $(2)^-$; possible IAS of ^{38}Cl g.s., $J^\pi=2^-$ in (^{3}He,d). Possible T=2.
10634 *2*	(6^+ to 10^+)		lM	Jπ: 2064γ to 8^+.
10657.9 *5*		<300 eV	P	
10666 *5*	(1^-,2^+,3^-,4^+)		J	Jπ: 6100γ and 6730γ to 2^+, 6855γ to 3^-, π=natural in (α,γ):resonances.
10673	(2^-)		S	Jπ: M2 excitation in (e,e′).
10676 *2*	(4^+ to 8^+)		Mn	E(level): from (α,pγ). Jπ: 4267γ to 6^+.
10684 *5*	1^-		J n	Jπ: 10682γ D to 0^+, π=natural in (α,γ):resonances.
10726 *5*	(1^- to 4^+)		J	Jπ: 8557γ to 2^+ and 5212γ to 3^-.
10732.4 *6*		<300 eV	P	
10768 *5*	2^+		J	Jπ: spin from γ(θ) and π=natural in (α,γ):resonances.
10803 *5*	2^+		JK	Jπ: 10801γ ΔJ=2 Q to 0^+, π=natural in (α,γ):resonances; L(^{7}Li,t)=2 from 0^+.
10815.6 *9*	(0 to 3^-)		P	Jπ: 4043γ and 4462γ to 1^-.
10816.2 *9*			P	γ′s from this level are unresolved from those associated with the 10815.6 level.
10827.0 *6*	(2)		P	Jπ: 10825γ to 0^+ and 6347γ to 4^-.
10850.1 *7*	(2^-,3^-)		P	Jπ: 4276γ and 5116γ to 1^-, 4640γ to 4^-.
10857 *5*	1^-		J	Jπ: 10855γ D to 0^+, π=natural in (α,γ):resonances.
10873.8 *5*	(0^+ to 3^-)		P	Jπ: 4520γ to 1^-, 5279γ and 5716γ to 2^+.
10890 *2*	(5^- to 8^-)		M	E(level): from (α,pγ). Jπ: 3382γ to 7^- and 2765γ (6^-).
10914.5 *5*	(1^-,2,3^-)	<0.2 keV	P	Jπ: 4561γ to 1^-, 5089γ and 5401γ to 3^-.
10933 *10*	1^-		J	Jπ: 10931γ D to 0^+, π=natural in (α,γ):resonances.
10945.0 *5*	(1^-,2^+)	<0.2 keV	P	Jπ: 10943γ to 0^+ and 5431γ to 3^-.
10947.4 *5*	(2^-,3,4^+)	<0.2 keV	P	Jπ: 6381γ to 2^+ and 4738γ to 4^-.
10947.5[b] *7*	(9^-)		E LM	Jπ: 2378γ ΔJ=1 d to 8^+, 773γ to 9^-, 3439γ to 7^-.
10962.3 *6*		<0.2 keV	P	
10963.3 *6*	$2^{(+)}$		P	Jπ: spin from γ(θ) in (p,γ):resonances, 7586γ to 0^+ and 5614γ to 4^+.
10967.5 *6*			P	
10979.9 *6*			P	E(level): probable doublet.
10988.2 *7*	(2)	<0.2 keV	P	Jπ: (2,3) from γ(θ) in (p,γ):resonances, 7611γ to 0^+ and 6508γ to 4^-.
11000.2 *6*			P	
11005.9 *6*			P	
11013 *7*	1		J	Jπ: 11011γ D to 0^+, π=natural in

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				(α,γ):resonances. This level could correspond to 11000.2, 11005.9 and 11014.6 levels in (p,γ):resonances.
11014.6 *6*			P	
11023.2 *6*			P	
11032 *6*	1^-		J	Jπ: 11030γ D to 0^+, π=natural in (α,γ):resonances. This level could correspond to 11023.2 in (p,γ):resonances.
11044.2 *6*		<0.2 keV	P	Jπ: see comment for 11045.1 level.
11045.2 *6*	(3^-)	<0.2 keV	J P	Jπ: 8877γ D+Q to 2^+; γ(θ) in (α,γ):resonances gives 3^- for unresolved 11044.2 and 11045.2 levels.
11051.5 *6*		<0.2 keV	P	
11053.7 *6*	(2)	<0.2 keV	P	Jπ: 11052γ to 0^+, 5540γ to 3^-, 4844γ to 4^-.
11059.2 *6*	$(1,2^+)$	<0.2 keV	P	Jπ: 11058γ and 6349γ to 0^+, 6493γ and 8891γ to 2^+.
11066.1 *6*	(2)	<0.2 keV	P	Jπ: 6356γ and 11064γ to 0^+, 6586γ to 4^-.
11067 *10*	1^-		J	Jπ: 11065γ D to 0^+, π=natural in (α,γ):resonances.
11068 *2*			M	E(level): from (α,pγ). 2943γ to (6^-) suggests that this level is different from 11067, 1^- level.
11078 *2*			M	E(level): from (α,pγ).
11083.7 *6*			P	
11087 *2*	$(4^+$ to $8^+)$		M	E(level): from (α,pγ). Jπ: 3798γ to 6^+.
11095.4 *6*			P	
11096.9 *6*	(2^+)	<0.2 keV	P	Jπ: 7719γ and 11095γ to 0^+, 5747γ to 4^+; π=natural from ^{37}Cl(p,α):res.
11099.1 *6*			P	
11106.9 *6*			P	
11107.1 *6*			P	
11109 *2*	$(4^-$ to $8^-)$		M	E(level): from (α,pγ). Jπ: 2984γ to (6^-).
11112.9 *6*		<0.2 keV	P	E(level): probable doublet. Jπ: π=natural from ^{37}Cl(p,α):res.
11116.9 *6*	3^-	<0.2 keV	P	Jπ: from (p,α(θ)) in (p,γ):resonances.
11122.9 *6*	3^-		J P	Jπ: 8954γ ΔJ=1 d+Q to 2^+, 6642γ to 4^-, π=natural in ^{37}Cl(p,α):res.
11124.9 *6*		<0.2 keV	P	
11135.0 *6*			P	
11136.4 *6*			P	
11144.4 *6*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11146.0 *6*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11146.9 *6*	$(2,3^-)$		P	Jπ: 11145γ to 0^+, 5797γ to 4^+ and 6666γ to 4^-.
11157.6 *7*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11161.0 *6*	$(2^-,3,4^+)$	<0.2 keV	P	Jπ: 7224γ to 2^+, 4559γ and 4951γ to 4^-.
11163 *2*	(6,7,8)		M	E(level): from (α,pγ). Jπ: 3086γ to 7^+ and 3655γ to 7^-.
11167.6 *6*	(3^-)	<0.2 keV	P	Jπ: from γ(θ) in (p,γ):resonances; 11166γ to 0^+, 4958γ to 4^-.
11173.0 *6*	3^-	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 7795γ to 0^+, 4571γ to 4^- and 5119γ to (4^+);
11174 *2*	$(5^-$ to $9^-)$		LM	E(level): from (α,pγ). Jπ: 2201γ to 7^-.
11175 *10*	1^-		J	Jπ: 11173γ D to 0^+, π=natural in (α,γ):resonances.
11182.6 *6*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11184.8 *6*	$(2^+,3^-)$	<0.2 keV	P	Jπ: (2,3) from γ(θ) in (p,γ):resonances, π=natural

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				from ^{37}Cl(p,α):res.
11188.6 *6*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11197.6 *6*	(1⁻,2,3⁻)	<0.2 keV	P	Jπ: 4425γ and 4844γ to 1⁻, 5684γ to 3⁻.
11199 *2*	(8,9,10⁺)		M	E(level): from (α,pγ). Jπ: 2629γ to 8⁺.
11200.5 *6*			P	
11201.9 *6*	1⁻	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11204.3 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11210.4 *7*	(1⁻,2,3⁻)	<0.2 keV	P	Jπ: 4437γ and 4636γ to 1⁻, 5385γ and 5697γ to 3⁻.
11214.7 *6*	(1⁻,2⁺)	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 6505γ and 11213γ to 0⁺, 6057γ and 6649γ to 2⁺.
11216.4 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11217.9 *6*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11226.0 *6*			P	
11227.3 *4*	(2⁺)	<0.2 keV	P	Jπ: (1,2,3) from (p,γ(θ)); 11226γ to 0⁺ and 5877γ to 4⁺.
11233.6 *7*	(2⁺,3⁻)	<0.2 keV	P	Jπ: 11232γ to 0⁺ and 5575γ to 5⁻; π=natural from ^{37}Cl(p,α):res.
11244.8 *6*	(3⁺)	<0.2 keV	P	Jπ: 4995γ to 2⁺, 4968γ to 4⁺ and 5035γ to 4⁻, 3875γ to (1⁺).
11250 *10*	1⁻		J	Jπ: 11248γ D to 0⁺; π=natural in (α,γ):resonances.
11259.8 *6*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11262.4 *6*			P	
11264.9 *6*	(2⁻,3⁻)	<0.2 keV	P	Jπ: 4492γ, 4690γ and 4911γ to 1⁻, 6784γ to 4⁻.
11268.1 *6*	3⁻	<0.2 keV	J P	Jπ: 3 from γ(θ) and π=natural in (α,γ):resonances.
11270.0 *6*	(1⁻,3⁻)	<0.6 keV	P	Jπ: from (p,α(θ)) in (p,γ):resonances.
11272.1 *6*	(3⁻)	<0.2 keV	P	Jπ: 5677γ to 2⁺, 5922γ to 4⁺ and 5062γ to 4⁻, 3902γ to (1⁺); π=natural from ^{37}Cl(p,α):res.
11275.5 *6*	(1⁻,2⁺)		P x	E(level): 11275.5 and 11275.7 are separate levels. Jπ: from α(θ) in (p,γ):resonances.
11275.7 *6*	(1,2⁺)	<0.2 keV	P x	Jπ: 6566γ and 11274γ to 0⁺, 5681γ to 2⁺.
11283.9 *6*			P x	Jπ: π=natural from ^{37}Cl(p,α):res.
11285.4 *6*	(2⁺,3)	<0.2 keV	P x	Jπ: 9117γ to 2⁺, 5428γ to (2)⁻ and 5936γ to 4⁺.
11287.2 *6*			P x	
11289.4 *6*	(3⁻)	<0.2 keV	P x	Jπ: 4715γ to 1⁻, 6809γ to 4⁻ and 5940γ to 4⁺.
11290 *2*	(7⁺ to 11⁺)		lM x	E(level): from (α,pγ). Jπ: 1356γ to (9⁺).
11291.5 *6*	(1⁻,2⁺)	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11292.0 *6*			P	
11298.7 *7*	(10⁺)		EF lM	Jπ: 1959.5γ ΔJ=2 Q to 8⁺, 1364γ ΔJ=1 d+Q to (9⁺).
11302.4 *5*	5⁻	<0.2 keV	Pq	T=1+2 XREF: q(11300). Jπ: from γ(θ,pol) in (p,γ):resonances; 5643γ M1+E2 to 5⁻; probable IAS of 671, 5⁻ in ^{38}Cl from (^{3}He,d).
11306.3 *6*	(1⁻,2⁺)	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11307.5 *6*	5⁻	<0.2 keV	Pq	T=1+2 XREF: q(11300). Jπ: from γ(θ,pol) in (p,γ):resonances; 5648γ M1+E2 to 5⁻; probable IAS of 671, 5⁻ in ^{38}Cl from (^{3}He,d).
11315 *10*	1⁻		J	Jπ: 11313γ D to 0⁺, π=natural in (α,γ):resonances.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
11316.7 *6*	(3⁻)	<0.2 keV	P	Jπ: (1⁻,3⁻) from α(θ) in (p,γ):resonances, 5658γ and 6730γ to 5⁻.
11318.7 *6*	(2⁺)	<0.2 keV	P	Jπ: 6609γ and 11317γ to 0⁺, 5969γ to 4⁺ and 6838γ to 4⁻.
11326.2 *6*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11327.3 *6*	(1⁻,2⁺)		P	Jπ: from α(θ) in (p,γ):resonances.
11328.3 *6*	(3⁻,4⁺)	<0.2 keV	P	Jπ: 9160γ to 2⁺ and 5669γ to 5⁻; π=natural from ^{37}Cl(p,α):res.
11330.1 *6*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11330.5 *6*	(1⁻ to 4⁺)	<0.2 keV	P	Jπ: 6173γ and 9162γ to 2⁺, 6453γ to 3⁻.
11338.6 *6*	(2⁺)	<0.2 keV	P	Jπ: (2,3) from γ(θ) in (p,γ):resonances; 11337γ to 0⁺ and 5513γ to 3⁻.
11348.9 *6*	(2⁻,3,4⁺)	<0.2 keV	P	Jπ: 7412γ and 9180γ to 2⁺, 6868γ to 4⁻.
11350.6 *6*	3⁻	<0.2 keV	Pq	T=1+2 Jπ: 9182γ E1(+M2) to 2⁺, 7540γ and 6473γ M1+E2 to 3⁻, 5074γ and 6001γ to 4⁺, 4749γ and 5141γ to 4⁻; π=natural from ^{37}Cl(p,α):res; possible IAS of 755, 3⁻ in ^{38}Cl from (^{3}He,d).
11354.6 *6*	3⁻	<0.2 keV	J Pq	T=1+2 E(level): possible doublet. Jπ: from α(θ) in (p,γ):resonances; possible IAS of 755, 3⁻ in ^{38}Cl from (^{3}He,d).
11359.4 *6*			P	
11361.9 *6*		<0.2 keV	P	
11367.4 *7*	3⁻	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11369.1 *7*			P	
11373.7 *7*	(1⁻,2,3⁻)	<0.2 keV	P	Jπ: 4799γ and 5639γ to 1⁻, 6496γ and 7563γ to 3⁻.
11374 *10*	1⁻		J	Jπ: 11372γ D to 0⁺, π=natural in (α,γ):resonances.
11375.6 *7*	4⁺	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11375.9 *7*			P	
11379 *2*	(4⁺ to 8⁺)		M	E(level): from (α,pγ). Jπ: 4970γ to 6⁺.
11379.1 *7*	(2⁺)	<0.2 keV	P	Jπ: (1⁻,2⁺) from α(θ) in (p,γ):resonances; 8001γ to 0⁺, 5103γ and 5337γ to 4⁺, 6898γ to 4⁻.
11383.1 *7*			P	
11383.4 *7*	(1⁻,2⁺)	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11384.9 *7*	3⁻		Pq	Jπ: from α(θ) in (p,γ):resonances; possible IAS of 755, 3⁻ in ^{38}Cl from (^{3}He,d). Possible T=2.
11389.9 *7*		<0.2 keV	P	
11393.0 *8*	3⁻	<0.2 keV	Pq	Jπ: from α(θ) in (p,γ):resonances; possible IAS of 755, 3⁻ in ^{38}Cl from (^{3}He,d). Possible T=2.
11399.5 *7*	(3⁻)	<0.2 keV	JK P	XREF: K(11400). Jπ: 9231γ D+Q to 2⁺; (α,γ(θ)); L(^{7}Li,t)=3 from 0⁺ for a group at 11400.
11401.5 *7*	(1⁻,2⁺)	<0.2 keV	P	Jπ: 6692γ and 11400γ to 0⁺, 7591γ to 3⁻.
11409.3 *7*	(2)	<0.2 keV	P	Jπ: 11408γ to 0⁺, 5200γ to 4⁻, 5133γ and 6059γ to 4⁺.
11422.7 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11423.9 *7*	(3⁻)	<0.2 keV	P	Jπ: 4849γ to 1⁻ and 6943γ to 4⁻; π=natural from ^{37}Cl(p,α):res.
11428 *2*	(4⁺ to 8⁺)		M	E(level): from (α,pγ). Jπ: 5019γ to 6⁺.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
11428.9 *7*	(3,4$^+$)	<0.2 keV	P	Jπ: 6271γ to 2$^+$, 6948γ to 4$^-$ and 5152γ and 6079γ to 4$^+$.
11431.9 *7*	1$^-$	<0.2 keV	J P	Jπ: 11430γ D to 0$^+$, π=natural in (α,γ):resonances.
11435.9 *7*	(2$^+$,3$^-$)	<0.2 keV	M P	Jπ: 11434γ and 6726γ to 0$^+$, 6849γ to 5$^-$.
11442.9 *7*	3$^-$		J P	Jπ: 9274γ ΔJ=1 d(+Q) to 2$^+$; 4841γ and 6962γ to 4$^-$; π=natural from ^{37}Cl(p,α):res.
11443.6 *7*	(2$^-$,3)	<0.2 keV	P	Jπ: (1,2,3) from γ(θ) in (p,γ):resonances; 4842γ to 4$^-$, 5390γ to (4$^+$), 5849γ and 9275γ to 2$^+$.
11452 *2*			M	E(level): from (α,pγ).
11452.7 *7*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11454.7 *7*			P	
11455.5 *7*			P	
11455.7 *7*			P	
11461.3 *8*	(1$^-$,2$^+$)	<0.2 keV	P	Jπ: 8084γ and 11459γ to 0$^+$, 7650γ to 3$^-$.
11463.3 *7*		<0.2 keV	P	
11466.2 *8*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11471.2 *7*	(1$^-$,2$^+$)	<0.2 keV	P	Jπ: 6761γ, 8093γ and 11469γ to 0$^+$, 7660γ to 3$^-$.
11478.4 *7*		<0.2 keV	P	See comment for 11478.9 level.
11478.9 *7*	(3$^-$)	<0.6 keV	P	Jπ: (1$^-$,3$^-$) from α(θ) in (p,γ):resonances; 5884γ to 2$^+$ and 5820γ to 5$^-$. γ transitions from either of the two levels: 11478.4 and/or 11478.9.
11482.4 *7*			P	
11483.4 *7*			P	
11484 *2*	(7$^-$ to 11$^-$)		M	E(level): from (α,pγ). Jπ: 1310γ to 9$^-$.
11487.2 *7*	(1$^-$,3$^-$)	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11493.6 *8*	2$^+$	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11495 *2*	(5$^+$ to 9$^+$)		M	E(level): from (α,pγ). Jπ: 3418γ to 7$^+$.
11501.3 *7*	(2$^+$)	<0.2 keV	P	Jπ: (1$^-$,2$^+$) from α(θ) in (p,γ):resonances; 6791γ, 8124γ and 11499γ to 0$^+$, 5292γ to 4$^-$.
11508.2 *7*	(1$^-$,2$^+$)	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11511.1 *7*			P	
11511.7 *7*	(2)		P	Jπ: 11510γ to 0$^+$, 5302γ and 7031γ to 4$^-$, 5235γ and 6162γ to 4$^+$.
11514.5 *7*	1$^-$	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 11513γ to 0$^+$, 6357γ to 2$^+$.
11518.6 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11519.7 *4*	(1$^-$,2$^+$,3$^-$)	<0.2 keV	P	Jπ: 4747γ to 1$^-$, 7709γ to 3$^-$; π=natural from ^{37}Cl(p,α):res.
11525.8 *7*		<0.2 keV	P	
11527.6 *7*	(1,2$^+$)	<0.2 keV	P	Jπ: 6818γ, 8150γ and 9359γ to 0$^+$.
11530.2 *7*	(1$^-$,2$^+$)	<0.2 keV	P	Jπ: 6820γ, 8152γ and 11528γ to 0$^+$; π=natural from ^{37}Cl(p,α):res.
11531.9 *7*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11534.2 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11538.3 *7*		0.33 keV *11*	P	
11540.2 *7*	1$^-$		P	Jπ: from α(θ) in (p,γ):resonances.
11543 *2*	(5$^+$ to 9$^+$)		M	E(level): from (α,pγ). Jπ: 3466γ to 7$^+$.
11544.5 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
11545.3 *7*	(1⁻,2)		P	Jπ: 11543γ to 0⁺ and 6032γ to 3⁻; π=natural from ^{37}Cl(p,α):res.
11547 *2*	(7⁻ to 11⁻)		M	E(level): from (α,pγ). Jπ: 1373γ to 9⁻.
11549.1[a] *4*	(10⁻)		E	Jπ: 1524.4γ ΔJ=2 Q to (8⁻); 1374.7γ ΔJ=1 d+Q to 9⁻.
11552.6 *7*	(1)⁻	<0.2 keV	P	Jπ: (0⁺,1⁻,2⁺) from α(θ) in (p,γ):resonances; 8175γ and 11551γ to 0⁺, 5727γ and 6675γ to 3⁻; L(p,p)=1 in (p,γ):resonances.
11558.1 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11558.4 *7*	(1⁺)	<0.2 keV	P S	XREF: S(11556). Jπ: M1 excitation in (e,e′).
11561.9 *7*		<0.2 keV	P	
11569.2 *7*	(1⁻,2,3⁻)	<0.2 keV	P	Jπ: 4995γ and 5835γ to 1⁻, 6055γ and 7758γ to 3⁻.
11574.0 *7*			P	
11578.1 *8*	(1⁻,2⁺)		P	Jπ: from α(θ) in (p,γ):resonances.
11579.4 *7*	(1⁻,2⁺)	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11581.2 *7*			P	
11582.1 *7*			P	
11592.9 *7*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11593.7 *7*		<0.2 keV	P	
11595 *2*	(4⁺ to 8⁺)		M	E(level): from (α,pγ). Jπ: 5186γ to 6⁺.
11597.9 *7*	4⁺	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 9429γ to 2⁺ and 5939γ to 5⁻; π=natural from ^{37}Cl(p,α):res.
11599.6 *8*	(1,2⁺)	<0.2 keV	P	Jπ: 11598γ to 0⁺, 5349γ and 9431γ to 2⁺, 5742γ to (2)⁻.
11605.8 *7*	(1,2⁺)	<0.2 keV	P	Jπ: 11604γ to 0⁺.
11607.3 *8*			P	Jπ: π=Natural from ^{37}Cl(p,α):res.
11608 *2*	(5⁺ to 9⁺)		M	E(level): from (α,pγ). Jπ: 3531γ to 7⁺.
11608.3 *8*	(1⁻,2⁺)		P	Jπ: from α(θ) in (p,γ):resonances.
11609.1 *7*			P	
11612.5 *7*			P	
11613.2 *7*			P	Jπ: π=Natural from ^{37}Cl(p,α):res.
11614.7[c] *3*	11⁻	4.9 ps *21*	EF H LM	Jπ: 1440.3γ ΔJ=2 E2 to 9⁻; band member. $T_{1/2}$: from ^{27}Al(^{14}N,n2pγ).
11615.8 *7*	1⁻	0.42 keV *16*	P	Jπ: from α(θ) in (p,γ):resonances.
11618.1 *7*		<0.2 keV	P	
11620 *2*	(7⁺ to 11⁺)		M	E(level): from (α,pγ). Jπ: 1686γ to (9⁺).
11622.7 *7*		<0.2 keV	P	
11623.5 *7*			P	
11624.8 *7*	(1⁻,2⁺)	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11630 *2*			M	E(level): from (α,pγ).
11641.1 *7*		<0.2 keV	P	
11643.3 *7*	(1⁻,2⁺)	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11643.4 *7*			P	
11645.3 *7*			P	
11647.0 *7*		<0.2 keV	P	
11650.9 *23*	(9⁻)		E	Jπ: 2301γ ΔJ=2 Q to (7⁻).
11651.4 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11652.1 *7*	(3,4⁺)	<0.2 keV	P	Jπ: 6057γ, 7086γ and 9483γ to 2⁺, 5442γ

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				and 7171γ to 4⁻, 6302γ to 4⁺.
11653.9 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11656.6 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11660.0 *7*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11661.4 *7*			P	
11665.3 *7*			P	
11666.6 *7*		<0.2 keV	P	
11667.8 *7*		<0.2 keV	P	
11670.7 *7*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11672.3 *8*	(3)	<0.2 keV	P	Jπ: (2,3) from γ(θ) in (p,γ):resonances; 5070γ to 4⁻ and 5396γ to 4⁺.
11679.6 *7*			P	
11682.7 *7*	(4⁺)	<0.2 keV	P	Jπ: (4⁺,5⁻) from α(θ) in (p,γ):resonances; 5432γ and 7117γ to 2⁺, 7096γ to 5⁻.
11685.5 *7*		<0.2 keV	P	
11686.0 *7*	2⁺	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11686.9 *7*			P	
11695.7 *7*		<0.2 keV	P	
11701.8 *7*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11703.5 *7*	(3⁻,4⁺)	<0.2 keV	P	Jπ: 7137γ and 7766γ to 2⁺, 7117γ to 5⁻.
11706.5 *7*		<0.2 keV	P	
11709.2 *8*			P	
11710.0 *8*			P	
11712.3 *8*	4⁺	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11716	(1⁺)		S	Jπ: M1 excitation in (e,e′).
11716.6 *8*	(2⁺)	<0.6 keV	P	Jπ: 11715γ, 7007γ and 8339γ to 0⁺, 5507γ to 4⁻; π=natural from ^{37}Cl(p,α):res.
11722.6 *8*			P	
11723.4 *8*	(0 to 3)⁻	<0.2 keV	P	Jπ: L(p,p)=1 from 3/2⁺ in (p,γ):resonances. (2J+1)$Γ_p$=0.9 keV *3*.
11724.1 *8*			P	
11726.0 *8*			P	
11727.8 *8*	2⁺		P	Jπ: from α(θ) in (p,γ):resonances.
11728.2 *8*			P	
11731.2 *8*	(4⁺)	<0.6 keV	P	E(level): probable doublet from (p,γ):resonances (1974Al05). Jπ: (4⁺,5⁻) from α(θ) in (p,γ):resonances; 6136γ and 7165γ to 2⁺, 6072γ and 7145γ to 5⁻.
11736.5 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11737.1 *8*			P	
11738.9 *8*			P	
11739.3 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11742.9 *9*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11743.8 *8*	(1)⁻	0.7 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances; L(p,p)=1 from 3/2⁺.
11748.5 *8*		<0.2 keV	P	
11751.8 *8*			P	
11755.6 *8*	(3⁻,4⁺)	<0.2 keV	P	Jπ: 9587γ and 7818γ to 2⁺, 7275γ to 4⁻; π=natural from ^{37}Cl(p,α):res.
11758.7 *8*	(1,3)⁻		P	Jπ: π=natural from ^{37}Cl(p,α):res; L(p,p)=1 from 3/2⁺. (2J+1)$Γ_p$=0.36 keV *18*.
11765.1 *8*			P	
11765.9 *8*			P	
11766.4 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
11767.7 *8*		<0.2 keV	P	
11769.9 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11772.9 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11775.0 *8*	4^+	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 9606γ to 2^+, 4486γ to 6^+.
11780.7 *8*	$(1,2,3)^-$	<0.2 keV	P	Jπ: 5427γ to 1^-, 5955γ and 6267γ to 3^-; L(p,p)=1 from $3/2^+$. (2J+1)Γ_p=0.6 keV *2*.
11784.1 *8*	$(1^-,3^-)$	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11784.2 *8*		<0.2 keV	P	
11788.1 *8*	2^+		P	Jπ: from α(θ) in (p,γ):resonances.
11790.5 *8*	(2^+)	<0.2 keV	P	Jπ: 11789γ and 7081γ to 0^+, 5581γ to 4^-, and 5737γ to (4^+).
11791.0 *8*	1^-	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11794.5 *8*	$(1^-,2^+,3^-,4^+)$	<0.2 keV	P	Jπ: 9626γ to 2^+ and 6281γ to 3^-; π=natural from ^{37}Cl(p,α):res.
11797.9 *8*	$(1^-,2,3,4^+)$	<0.2 keV	P	Jπ: 6203γ and 7232γ to 2^+, 6284γ and 7987γ to 3^-.
11800.1 *8*	$(1,2^+)$	<0.2 keV	P	Jπ: 11798γ to 0^+.
11802.0 *8*		<0.2 keV	P	
11805.9 *8*	3^-	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 5556γ to 2^+, 6722γ to $(2)^-$, 6456γ to 4^+, 7325γ to 4^-.
11810.5 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11812.2 *8*	$(1,2^+)$	<0.2 keV	P	Jπ: 11810γ to 0^+.
11814.9 *8*	(1^-)	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11819.1 *8*			P	Jπ: π=natural ^{37}Cl(p,α):res.
11823.1 *8*	$(3^-,4^+)$	<0.2 keV	P	Jπ: 5573γ to 2^+, 6164γ and 7237γ to 5^-.
11828.7 *8*			P	
11832.0 *8*	3^-	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances; 7266γ, 7895γ and 9663γ to 2^+, 7245γ to 5^-.
11835.0 *8*			P	
11836.6 *8*			P	
11840.0 *3*	2^+	0.302 keV	P R	E(level): weighted average of 11840.3 *8* from (p,γ):resonances and 11840.0 *3* from (n,n),(n,α):resonances. Jπ: from α(θ) in (p,γ):resonances; also from ^{37}Ar(n,n),(n,α):resonances with L(n)=0 from $3/2^+$. Γ from ^{37}Ar(n,n),(n,α): resonances.
11841.0 *3*	2^+	0.267 keV	P R	E(level): weighted average of 11841.3 *8* from (p,γ):resonances and 11841.0 *3* from (n,n),(n,α):resonances. Γ and J from ^{37}Ar(n,n),(n,α):resonances.
11842.2 *8*			P	
11842.5 *8*			P	
11844.1 *8*			P	
11845.8 *8*			P	
11849.7 *8*		<0.2 keV	P	
11851.3 *8*			P	
11851.9 *8*			P	
11855.7 *8*	(1^+)		P S	XREF: S(11855). Jπ: M1 excitation in (e,e′).
11859.4 *4*			R	
11861.2 *8*	$(1^-,2^+)$		P	Jπ: from α(θ) in (p,γ):resonances.
11861.7 *8*			P	

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
11864.7 *8*	$(1^-,3^-)$	<0.2 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11865.5 *8*			P	
11873.8 *8*	$(3,4^+)$	<0.2 keV	P	Jπ: 6716γ and 9705γ to 2^+, 5597γ to 4^+, 7393γ to 4^-.
11875.5 *7*			R	E(level): from (n,n),(n,α):resonances.
11877.7 *8*	$(0\text{ to }3)^-$	0.19 keV *12*	P	Jπ: L(p,p)=1 from $3/2^+$.
11880.9 *8*	$(1^-,3^-)$	<0.3 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11882.3 *8*			P	
11887.8 *8*	$(1,2,3)^-$	0.50 keV *13*	P	Jπ: 9719γ, 7950γ, 6730γ and 6293γ to 2^+, 6804γ to $(2)^-$; L(p,p)=1 from $3/2^+$.
11890.2 *10*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11891.5 *8*			P	
11894.7 *8*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11898.0 *8*		<0.3 keV	P	
11901.6 *10*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11902.3 *8*		<0.2 keV	P	
11904.6 *10*			P	
11905.7 *8*	$(3^-,4,5^-)$		P	Jπ: 7028γ and 8095γ to 3^-, 6247γ and 7319γ to 5^-.
11915.4[@] *7*	(10^+)		E	Jπ: 2576.2γ ΔJ=2 Q to 8^+; band member.
11916.3 *8*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
11917.0 *8*		1.73 keV *14*	P	
11918.4 *8*			P	
11922.8 *8*			P	
11928.0 *9*	4^-	<0.3 keV	PQ	Jπ: 5326γ M1(+E2) and 5718γ M1(+E2) to 4^-, 6414γ D(+Q) to 3^-, 7341γ D+Q to 5^-; possible IAS of 1309, 4^- in ^{38}Cl from (^{3}He,d). possible T=2.
11928.4 *8*	$1^-,2^+$	<0.2 keV	P	Jπ: (p,α(θ)).
11935.0 *8*	4^+	<0.2 keV	P	Jπ: (p,α(θ)).
11940.2 *8*		0.51 keV *18*	P	
11943.3 *8*			P	
11945.9 *8*		0.45 keV *16*	P	
11949.0 *8*		<0.07 keV	P	
11957.4 *8*		<0.2 keV	P	
11966.3 *8*		<0.2 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11967.8 *8*			P	
11972.0 *8*			P	
11972.9 *8*	$(1^-,3^-)$	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
11977.8 *8*		<0.2 keV	P	
11982.1 *19*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
11995			P	
11997.5[b] *12*	$(7^-\text{ to }11^-)$		E	Jπ: 1050γ to (9^-).
11998.7 *19*		<0.6 keV	P	Jπ: π=natural from ^{37}Cl(p,α):res.
12000	(1^+)		S	Jπ: M1 excitation in (e,e′).
12003.6		<1.0 keV	P	
12005.9 *19*	$(1^-,3^-)$	1.0 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12011.9		<1.0 keV	P	
12013.9		<1.0 keV	P	
12017.1 *19*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
12024.1 *19*	2^+	1.2 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12031.2		<1.0 keV	P	
12038.6 *19*	1^-		P	Jπ: from α(θ) in (p,γ):resonances.

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Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
12042.0 *19*	(1⁻,2⁺)	1.5 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12043.2		2.5 keV	P	
12053.5 *19*	2⁺	<0.6 keV	P	Jπ: from α(θ) in (p,γ):resonances.
12060.7		1.6 keV	P	
12063.4 *19*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
12067.4 *19*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
12071.0 *19*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
12076.2			P	
12078.1			P	
12081.5 *19*			P	Jπ: π=natural from ^{37}Cl(p,α):res.
12085.5 *19*	1⁻	2.1 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12094.3			P	
12097.5 *19*	2⁺	3.0 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12106.4			P	
12106.8[&] *20*	(10⁺)		E	Jπ: 3537γ to 8⁺; band member.
12110.6 *19*		2.6 keV *6*	P	Jπ: π=natural from ^{37}Cl(p,α):res.
12117.3 *19*	1⁻	1.1 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12122.6 *19*	(1⁻,3⁻)		P	Jπ: from α(θ) in (p,γ):resonances.
12127.5 *19*	(1⁻,2⁺)	1.4 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12131.8		2.3 keV	P	
12134	(1⁺)		S	Jπ: M1 excitation in (e,e′).
12136.1 *19*	1⁻	2.3 keV *6*	P	Jπ: from α(θ) in (p,γ):resonances.
12143.1 *19*		1.1 keV *6*	P	Jπ: π=natural from ^{37}Cl(p,α):res.
12146.2			P	
12149.7			P	
12153.1 *19*			P	Jπ: π=natural from ^{37}Cl(p,α).
12159			P	
12175.7		3.8 keV	P	
12185.2			P	
12188.8			P	
12199.1			P	
12.2×10³ *1*	(3⁻)		K	Jπ: L(^{7}He,t)=3 from 0⁺.
12206.4			P	
12215.0		4.4 keV	P	
12233.2			P	
12239.5			P	
12250.5			P	
12298.2			P	
12325			P	
12334.0			P	
12343.8			P	
12350.5			P	
12357.3			P	
12364.1			P	
12368.9			P	
12369	(1⁺)		S	Jπ: M1 excitation in (e,e′).
12373.4		2.7 keV	P	
12394	(3⁻,4,5⁻)		P	Jπ: 6880γ and 7516γ to 3⁻, 6735γ and 7807γ to 5⁻.
12405	(3⁻,4,5⁻)		P	Jπ: 6891γ and 6579γ to 3⁻, 7818γ to 5⁻.
12409.3			P	
12416			P	
12420.0			P	
12441.9		3.5 keV	P	
12454			P	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
12459.7			P	
12468.2			P	
12473.9			P	
12484.0			P	
12489.0			P	
12494.9			P	
12498			P	
12503.7			P	
12509.1			P	
12518			P	
12528.6			P	
12540.0			P	
12544.7			P	
12553.3			P	
12561.6			P	
12565.5			P	
12572.2		3.3 keV	P	
12577.7		4.1 keV	P	
12588.3		1.8 keV	P	
12593.0		1.8 keV	P	
12598.0		1.8 keV	P	
12601.4			P	
12611.3		3.1 keV	P	
12620.7		3.3 keV	P	
12631.2		2.4 keV	P	
12637.8		2.1 keV	P	
12642.3		4.3 keV	P	
12656.2		2.4 keV	P	
12665.2		4.3 keV	P	
12669.6		4.3 keV	P	
12672.8		4.3 keV	P	
12681.7		4.3 keV	P	
12699			P	
12.7×10^3 *1*	(3^-)		K	Jπ: L(^{7}Li,t)=3 from 0^+.
12706			P	
12712			P	
12718		3.3 keV	P	
12727			P	
12741			P	
12746		5.6 keV	P	
12752			P	
12769		7.8 keV	P	
12787			P	
12798		19 keV	P	
12811			P	
12818			P	
12831			P	
12839		3.2 keV	P	
12847			P	
12862			P	
12877			P	
12894			P	
12900		12 keV	P	
12906			P	
12927			P	
12933			P	
12940			P	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{38}Ar Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
12948			P	
12958		12 keV	P	
12976			P	
12994			P	
12999		3.3 keV	P	
13013			P	
13022			P	
13034			P	
13044			P	
13070			X	
13116		39 keV	P	
13178		21 keV	P	
13320			X	
13680			X	
13683.7[a] *6*	(12^-)		E	Jπ: 2134.9γ ΔJ=2 Q to (10^-), 2068.5 ΔJ=1 d+Q to 11^-.
13891	(1^+)		S	Jπ: M1 excitation in (e,e′).
13967	(1^+)		S	Jπ: M1 excitation in (e,e′).
14066	(1^+)		S	Jπ: M1 excitation in (e,e′).
14119.7 *18*	(8^+,9,10,11^+)		E	Jπ: 4185γ to (9^+) and 2821γ to (10^+).
14206	(1^+)		S	Jπ: M1 excitation in (e,e′).
14.3×10^3 *1*	(3^-)		K	Jπ: L(^{7}Li,t)=3 from 0^+.
14391.2[&] *10*	(12^+)		E	Jπ: 2475.7γ ΔJ=2 Q to (10^+); band member.
14877.5[@] *21*	(12^+)		E	Jπ: 2962γ to (10^+); band member.
14924	(1^-)		S	Jπ: E1 excitation in (e,e′).
15.0×10^3 *1*	(4^+,5^-)		K	Jπ: L(^{3}Li,t)=(4,5) from 0^+.
15393.9[c] *21*	(13^-)		E	Jπ: 3779γ ΔJ=2 Q to $(11)^-$.
17002.3[&] *14*	(14^+)		E	Jπ: 2611γ to (12^+); possible band member.
17780.9[a] *21*			E	Jπ: 4097γ to (12^-).
18070?[@] *4*	(14^+)		E	Jπ: possible 3192γ to (12^+); possible band member.
18784 *30*	0^+		X	T=3 Jπ: L(p,t)=0 from 0^+.
19770	(8^+)		J	Jπ: L=8 from α(θ) in ^{34}S(α,α).
19913	(8^+)		J	Jπ: L=8 from α(θ) in ^{34}S(α,α).
21662?[@] *5*	(16^+)		E	Jπ: possible 3592γ to (14^+); possible band member.

† From a least-squares fit to γ-ray energies when γ-ray energy uncertainties are assigned, and others are from (p,γ):resonances, unless otherwise noted.
‡ Additional information 46.
# Lifetimes and widths are from (p,γ):resonances, unless otherwise noted. Some lifetime measurements are from (α,pγ) and a few from other γ-ray reactions.
@ Band(A): 2^+ band 1.
& Band(B): 2^+ band 2.
a Band(C): Band based on (6^-).
b Seq.(D): γ sequence based on 3^-.
c Seq.(E): γ sequence based on 5^-.

Adopted Levels, Gammas (continued)

γ(^{38}Ar)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.#	δ#	$I_{(\gamma+ce)}$	Comments
2167.472	2^+	2167.405 *12*	100	0.0	0^+	E2			B(E2)(W.u.)=3.40 *16* E_γ: weighted average of 2167.400 *9* from ^{38}Cl β^- decay (37.230 m), 2167.5 *3* from ^{38}K ε decay (7.651 m), 2167.5 *5* from (^{28}Si,α2pγ), 2167.53 *5* from (^{14}N,n2pγ), 2167.61 *14* from (p,γ):resonances, and 2167 *1* from (π^-,pnγ). Mult.: from γ(θ,pol) in (p,γ):resonances, (^{14}N,n2pγ), and (^{16}O,αpγ).
3376.9	0^+	1209.4 *3*	100	2167.472	2^+	E2			B(E2)(W.u.)=1.26 *8* E_γ: weighted average of 1209.8 *4* from (^{14}N,n2pγ), 1210 *1* from (α,γ):resonances, and 1209.1 *3* from (p,γ):resonances.
		3376.7		0.0	0^+	E0		0.66 *10*	Mult.,$I_{(\gamma+ce)}$: E0 decay by e^+e^- pair (1975So11) in (αpγ). q^2_K(E0/E2)=0.81 *12*, X(E0/E2)=0.51 *8*, ρ^2(E0)=0.018 *3* (2005Ki02 evaluation).
3810.18	3^-	1642.66 *3*	100.00 *20*	2167.472	2^+	E1(+M2)	+0.016 *13*		B(E1)(W.u.)=0.0024 *+8−5* E_γ: weighted average of 1642.68 *2* from ^{38}Cl β^- decay (37.230 m), 1642.7 *4* from (^{28}Si,α2pγ), 1642.4 *3* from (^{16}O,2pγ), 1642.42 *10* from (^{14}N,n2pγ), 1642.31 *14* from (p,γ):resonances, and 1643 *1* from (π^-,pnγ). I_γ: from ^{38}Cl β^- decay. Mult.: from γ(θ,pol) in (^{16}O,2pγ), (p,γ):resonances and (^{14}N,n2pγ); Mult.=E1 with ΔJ=1 is also supported by γ(θ,pol) in (^{16}O,αpγ), γ(DCO) in (^{28}Si,α2pγ) and γγ(θ) in ^{38}Cl β^- decay. δ: from (^{16}O,2pγ). Other: +0.01 *2* from (p,γ):resonances.
		3810.01 *7*	0.079 *6*	0.0	0^+	[E3]			B(E3)(W.u.)=17 *+8−5* E_γ,I_γ: from ^{38}Cl β^- decay.
3936.5	2^+	559.6@	<0.32	3376.9	0^+				
		1770 *1*	7.1 *6*	2167.472	2^+				E_γ: weighted average of 1769 *1* from (^{28}Si,α2pγ) and 1771 *1* from (α,γ):resonances. I_γ: weighted average of 10 *5* from (^{28}Si,α2pγ), 11 *6* from (α,pγ), and 7.0 *6* from (p,γ):resonances.
		3936.1 *5*	100.0 *6*	0.0	0^+	[E2]			B(E2)(W.u.)=1.71 *+24−19* E_γ: weighted average of 3935.6 *5* from ^{38}K ε decay (7.651 m), 3938 *2* from (^{28}Si,α2pγ), 3936.1 *7* from (^{14}N,n2pγ), 3938 *3* from (α,γ):resonances, 3936.1 *5* from (p,γ):resonances, and 3937 *1* from (π^-,pnγ). I_γ: from (p,γ):resonances.
4479.98	4^-	669.78 *8*	100	3810.18	3^-	M1(+E2)	+0.011 *13*		B(M1)(W.u.)=0.076 *+20−16* E_γ: weighted average of 669.6 *2* from (^{28}Si,α2pγ), 669.6 *3* from

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Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
								(^{16}O,2pγ), 669.87 *8* from (^{14}N,n2pγ), 670 *1* from (α,γ):resonances, 669.58 *14* from (p,γ):resonances, and 671 *1* from (π^-,pnγ). Mult.: from γ(θ,pol) in (^{16}O,2pγ), (^{14}N,n2pγ) and (p,γ):resonances, with ΔJ=1; D+Q from γ(DCO) in (^{28}Si,α2pγ) and M1 from γ(θ,pol) in (^{16}O,αpγ). δ: from (^{16}O,2pγ). Other: +0.01 *2* from (p,γ):resonances.
4565.5	2^+	629.0	2.0 *3*	3936.5	2^+			
		755.3	1.9 *3*	3810.18	3^-	[E1]		B(E1)(W.u.)=0.00070 *+20−17*
		1188.6[@]	<0.8	3376.9	0^+			
		2398.1 *5*	100.0 *4*	2167.472	2^+			E_γ: from (p,γ):resonances.
		4565.2[@]	<2	0.0	0^+			
4585.87	5^-	105.894 *12*	100.0 *11*	4479.98	4^-	M1(+E2)	−0.02 *3*	B(M1)(W.u.)=0.124 *6* E_γ: weighted average of 105.9 *1* from (^{28}Si,α2pγ), 105.894 *12* from (^{16}O,2pγ), 105.92 *10* from (^{14}N,n2pγ), and 105.5 *4* from (p,γ):resonances. Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		775.70 *16*	12.5 *12*	3810.18	3^-	E2		B(E2)(W.u.)=0.223 *20* E_γ: weighted average of 775.5 *3* from (^{28}Si,α2pγ), 775.79 *13* from (^{14}N,n2pγ), and 774.9 *5* from (p,γ):resonances. I_γ: weighted average of 13.3 *12* from (^{28}Si,α2pγ), 16.0 *20* from (^{14}N,n2pγ), and 11.0 *10* from (p,γ):resonances. Mult.: from γ(θ,pol) in (^{14}N,n2pγ) and (p,γ):resonances.
		2418.3	0.45 *11*	2167.472	2^+	[E3]		B(E3)(W.u.)=0.88 *+28−25*
4709.3	0^+	772.8 *9*	100	3936.5	2^+	[E2]		B(E2)(W.u.)=1.6×10^2 *+11−9* E_γ: weighted average of 773.3 *5* from (p,γ):resonances and 771 *1* from (π^-,pnγ).
4877.0	3^-	940.5[@]	<4	3936.5	2^+			
		1066.8 *3*	100.0 *8*	3810.18	3^-	M1(+E2)	+0.03 *7*	B(M1)(W.u.)=0.27 *+10−6* E_γ: from (p,γ):resonances. Mult.,δ: from γ(θ,pol) in (p,γ):resonances; D(+Q) from γ(θ) in (α,pγ) with δ=+0.16 *+10−16* or 0.0 *+3−1*.
		1500.1[@]	<2	3376.9	0^+			
		2709.4	91.2 *8*	2167.472	2^+	E1+M2	+0.10 *7*	B(E1)(W.u.)=0.00040 *+15−10*; B(M2)(W.u.)=2.5 *+73−24* E_γ: from (p,γ):resonances. Mult.,δ: from γ(θ,pol) in (p,γ):resonances; D+Q from γ(θ) in (α,pγ) with δ=−0.30 *+7−14* or −2.7 *3*.
		4876.7[@]	<8	0.0	0^+			
5083.6	$(2)^-$	1273.4	7.3 *5*	3810.18	3^-			
		2916 *1*	100.0 *5*	2167.472	2^+	[E1]		B(E1)(W.u.)=0.00056 *+22−13*
		5083.2[@]	<5	0.0	0^+			

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Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
5157.3	2$^+$	677.3[@]	<4	4479.98	4$^-$		
		1220.8	42 *6*	3936.5	2$^+$		
		1347.1	25 *4*	3810.18	3$^-$	[E1]	B(E1)(W.u.)=0.0014 *+11−6* I_γ: other: 39 *7* in (α,pγ).
		2989.7	100 *4*	2167.472	2$^+$		
		5156.9	25 *8*	0.0	0$^+$	[E2]	B(E2)(W.u.)=0.11 *+11−6*
5349.4	4$^+$	784 *1*	2.5 *13*	4565.5	2$^+$	[E2]	B(E2)(W.u.)=27 *+35−18* E_γ,I_γ: from (^{28}Si,α2pγ).
		869.4[@]	<3	4479.98	4$^-$		
		1413.1 *4*	50 *3*	3936.5	2$^+$	[E2]	B(E2)(W.u.)=28 *+16−9* E_γ: from (^{28}Si,α2pγ). I_γ: weighted average of 48 *4* from (^{28}Si,α2pγ), 54 *9* from (α,pγ), and 50.3 *26* from (p,γ):resonances.
		1539 *1*	12.7 *21*	3810.18	3$^-$	[E1]	B(E1)(W.u.)=9×10^{-5} *+7−4* E_γ: from (^{28}Si,α2pγ). I_γ: weighted average of 11.3 *25* from (^{28}Si,α2pγ) and 13.6 *21* from (p,γ):resonances.
		3182.2 *7*	100 *5*	2167.472	2$^+$	E2	B(E2)(W.u.)=1.0 *+5−3* E_γ: weighted average of 3183 *2* from (^{28}Si,α2pγ) and 3182.1 *7* from (^{14}N,n2pγ). Mult.: Q from γ(DCO) in (^{28}Si,α2pγ); M2 ruled out by RUL.
		5349.0[@]	<5	0.0	0$^+$		
5513.3	3$^-$	636.3	38.2 *13*	4877.0	3$^-$		
		947.8	<4	4565.5	2$^+$		
		1033.3 *4*	100 *4*	4479.98	4$^-$		
		1576.8[@]	6	3936.5	2$^+$		
		1703.1	14.3 *17*	3810.18	3$^-$		
		2136.3[@]	<4	3376.9	0$^+$		
		3345.7	54 *4*	2167.472	2$^+$	[E1]	B(E1)(W.u.)=2.0×10^{-5} *+14−7*
		5512.9[@]	<12	0.0	0$^+$		
5552.21	1$^+$,2$^+$	986.7	53 *5*	4565.5	2$^+$		
		1615.7	100 *8*	3936.5	2$^+$		
		1742.0[@]	<8	3810.18	3$^-$		
		3384.6	68 *8*	2167.472	2$^+$		
		5551.8	30 *8*	0.0	0$^+$		
5594.6	2$^+$	1029.1	62 *5*	4565.5	2$^+$		
		1114.6[@]	<8	4479.98	4$^-$		
		1658.1	100 *8*	3936.5	2$^+$		
		1784.4[@]	<18	3810.18	3$^-$		
		2217.6	39 *5*	3376.9	0$^+$	[E2]	B(E2)(W.u.)=3.3 *+26−13*

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Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
5594.6	2^+	5594.2	56 *5*	0.0	0^+	[E2]		B(E2)(W.u.)=0.047 *+34−17*
5658.61	5^-	1072.8 *3*	100.0 *6*	4585.87	5^-	M1(+E2)	−0.10 *9*	B(M1)(W.u.)=0.54 *+12−14* E_γ: weighted average of 1073.2 *4* from (^{28}Si,α2pγ), 1072.5 *4* from (^{16}O,2pγ), 1072.7 *3* from (^{14}N,n2pγ), and 1072.7 *3* from (p,γ):resonances. Mult.,δ: from γ(θ,pol) in (p,γ):resonances with ΔJ=0, also supported by γ(DCO) in (^{28}Si,α2pγ).
		1178.6 *6*	9.4 *4*	4479.98	4^-			E_γ: from (^{28}Si,α2pγ). I_γ: from (p,γ):resonances. Other: 9.7 *14* from (^{28}Si,α2pγ).
		1722.1[@]	<0.6	3936.5	2^+			
		1848.4	2.5 *4*	3810.18	3^-	[E2]		B(E2)(W.u.)=2.6 *+11−8*
		3491.0[@]	<0.6	2167.472	2^+			
5733.9	1^-	5733.4		0.0	0^+	[E1]		B(E1)(W.u.)>0.00079
5824.9	3^-	741.3	25 *3*	5083.6	$(2)^-$			
		947.9	56 *6*	4877.0	3^-			
		1344.9	59 *6*	4479.98	4^-			
		2014.7	100 *10*	3810.18	3^-			
		3657.2	72 *10*	2167.472	2^+	[E1]		B(E1)(W.u.)=1.1×10^{-5} *+23−9*
		5824.4[@]	<25	0.0	0^+			
5857.5	$(2)^-$	980.5	11.0 *11*	4877.0	3^-			
		1292.0[@]	<1.2	4565.5	2^+			
		1920.9[@]	<2.4	3936.5	2^+			
		2047.3	100.0 *21*	3810.18	3^-			
		2480.5[@]	<4	3376.9	0^+			
		3689.8	11.1 *17*	2167.472	2^+	[E1]		B(E1)(W.u.)=6.9×10^{-5} *+39−24*
5974.8	$(0^+$ to $3^-)$	817.5	8.8 *13*	5157.3	2^+			
		1409.3	30 *3*	4565.5	2^+			
		1494.8[@]	<3	4479.98	4^-			
		2038.2	17.3 *22*	3936.5	2^+			
		3807.1	100 *5*	2167.472	2^+			
		5974.3[@]	<5	0.0	0^+			
6041.8	$(3^-,4^+)$	1164.8[@]	<5	4877.0	3^-			
		1455.9	18 *3*	4585.87	5^-			
		1476.3[@]	<5	4565.5	2^+			
		1561.8	55 *5*	4479.98	4^-			
		2231.5	100 *5*	3810.18	3^-			
		3874.1[@]	<10	2167.472	2^+			
		6041.3[@]	<5	0.0	0^+			

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Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
6053.2	(4$^+$)	703.9 *3*	100 *6*	5349.4	4$^+$			E_γ: from (^{28}Si,α2pγ).
		1488 *1*	32 *4*	4565.5	2$^+$	[E2]		B(E2)(W.u.)=25 *+13−8* E_γ: from (^{28}Si,α2pγ). I_γ: other: 18 *5* from (^{28}Si,α2pγ).
		1573.2	13 *4*	4479.98	4$^-$	[E1]		B(E1)(W.u.)=0.00015 *+11−7*
		2116 *1*	41 *6*	3936.5	2$^+$	[E2]		B(E2)(W.u.)=5.5 *+27−17* E_γ: from (^{28}Si,α2pγ). I_γ: other: 27 *9* from (^{28}Si,α2pγ).
6209.4	4$^-$	1623.5	8.0 *10*	4585.87	5$^-$			
		1729.4 *6*	100.0 *10*	4479.98	4$^-$	M1+E2	−0.32 *10*	B(M1)(W.u.)=0.047 *+24−15*; B(E2)(W.u.)=6 *+8−4* Mult.,δ: D+Q from γ(θ) in (p,γ):resonances; M2 is ruled out by RUL.
		2272.8[@]	<1	3936.5	2$^+$			
		4041.7[@]	<2	2167.472	2$^+$			
		6208.9[@]	<1	0.0	0$^+$			
6213.8	(2$^+$)	1733.8[@]	<4	4479.98	4$^-$			
		2277.2	17 *3*	3936.5	2$^+$			
		4046.1	26 *3*	2167.472	2$^+$			
		6213.3	100 *4*	0.0	0$^+$			
6249.9	2$^+$	900.5	16.9 *26*	5349.4	4$^+$			
		1092.6	10.6 *22*	5157.3	2$^+$			
		1684.4	100 *8*	4565.5	2$^+$			
		2313.3[@]	<10	3936.5	2$^+$			
		2439.6[@]	<6	3810.18	3$^-$			
		2872.9	20 *6*	3376.9	0$^+$			
		4082.2	49 *8*	2167.472	2$^+$			
		6249.3[@]	<6	0.0	0$^+$			
6276.1	4$^+$	926.7	57 *8*	5349.4	4$^+$			
		1796.1	16 *6*	4479.98	4$^-$	[E1]		B(E1)(W.u.)=9×10^{-5} *+17−6*
		2339.5	31 *8*	3936.5	2$^+$	[E2]		B(E2)(W.u.)=1.9 *+28−10*
		2465.8[@]	<10	3810.18	3$^-$			
		2899.1[@]	<6	3376.9	0$^+$			
		4108.4	100 *6*	2167.472	2$^+$	[E2]		B(E2)(W.u.)=0.36 *+42−15*
		6275.5[@]	<8	0.0	0$^+$			
6338.6	1$^-$,2$^-$,3$^-$	1461.6	86 *12*	4877.0	3$^-$			
		2528.3	100 *12*	3810.18	3$^-$			
		2961.6	<17	3376.9	0$^+$			
		4170.9	100 *12*	2167.472	2$^+$	[E1]		B(E1)(W.u.)>0.00018
6353.5	1$^-$	6352.9	100	0.0	0$^+$	[E1]		B(E1)(W.u.)=0.00065 *+41−18*

From ENSDF

$^{38}_{18}Ar_{20}$-29

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
6408.32	6^+	749.9 *4*	0.55 *18*	5658.61	5^-	[E1]		B(E1)(W.u.)=8×10^{-6} *+7−4* E_γ,I_γ: from (^{16}O,2pγ).
		1058 *1*	3.3 *4*	5349.4	4^+	[E2]		B(E2)(W.u.)=1.8 *+12−6* E_γ,I_γ: from (^{16}O,2pγ).
		1822.40 *5*	100 *4*	4585.87	5^-	E1(+M2)	+0.007 *10*	B(E1)(W.u.)=0.00010 *+4−2* E_γ: weighted average of 1823.3 *4* from (^{28}Si,α2pγ), 1822.39 *16* from (^{16}O,2pγ), and 1822.39 *3* from (^{14}N,n2pγ). I_γ: from (^{16}O,2pγ). Mult.,δ: from γ(θ,pol) and γ(DCO) in (^{16}O,2pγ) with ΔJ=1, also supported by γ(θ,pol) in (^{14}N,n2pγ) and γ(DCO) in (^{28}Si,α2pγ).
6476.6	(0^+ to 3^-)	1599.6[@]	<3	4877.0	3^-			
		1911.0	100 *3*	4565.5	2^+			
		1996.6[@]	<10	4479.98	4^-			
		2540.0[@]	21 *3*	3936.5	2^+			
		2666.3[@]	<11	3810.18	3^-			
		3099.6[@]	<15	3376.9	0^+			
		4308.9[@]	43 *3*	2167.472	2^+			
		6476.0[@]	<13	0.0	0^+			
6485.4	(1^-,2,3^-)	2548.8[@]	<7	3936.5	2^+			
		2675.1	67 *8*	3810.18	3^-			
		3108.4[@]	<7	3376.9	0^+			
		4317.7	100 *8*	2167.472	2^+			
		6484.8[@]	<10	0.0	0^+			I_γ: other: Iγ(6485)/Iγ(4318)=100 *13*/33 *13* in (α,γ):resonances.
6495.8	(2^-,3^-)	1618.8	43 *7*	4877.0	3^-			
		1930.2[@]	<5	4565.5	2^+			
		2015.8	45 *5*	4479.98	4^-			
		2559.2	31 *5*	3936.5	2^+			
		2685.5	100 *10*	3810.18	3^-			
		3118.8[@]	<5	3376.9	0^+			
		4328.1	19 *5*	2167.472	2^+			
		6495.2[@]	<7	0.0	0^+			
6574.3	1^-	2094.3[@]	<2.5	4479.98	4^-			
		2637.7[@]	<4	3936.5	2^+			
		2764.0[@]	<6	3810.18	3^-			
		3197.3[@]	<4	3376.9	0^+			
		4406.6	27 *4*	2167.472	2^+	[E1]		B(E1)(W.u.)>0.00032

From ENSDF

$^{38}_{18}Ar_{20}$-30

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
6574.3	1⁻	6573.7	100 *4*	0.0	0⁺	[E1]		B(E1)(W.u.)>0.00040
6601.59	4⁻	1724.5	21.9 *22*	4877.0	3⁻			
		2015.7	3.0 *5*	4585.87	5⁻			
		2121.55 *21*	100.0 *24*	4479.98	4⁻	M1(+E2)	−0.05 *8*	B(M1)(W.u.)=0.15 *+4−3* Mult.,δ: ΔJ=0 from γ(θ) in (p,γ):resonances and RUL.
		2791.3	1.1 *4*	3810.18	3⁻			
6621.6	(1⁻,2,3⁻)	2056.0	80 *5*	4565.5	2⁺			
		2141.6[@]	<10	4479.98	4⁻			
		2685.0	39 *5*	3936.5	2⁺			
		2811.3	39 *5*	3810.18	3⁻			
		4453.8	100 *8*	2167.472	2⁺			
		6621.0[@]	<23	0.0	0⁺			
6674.4	5⁻	2088.6 *3*	100 *4*	4585.87	5⁻	M1		B(M1)(W.u.)=0.14 *+7−4* E_γ: weighted average of 2088.7 *6* from (^{28}Si,α2pγ) and 2088.6 *3* from (^{16}O,2pγ). Mult.: D with ΔJ=0 from γ(θ) in (p,γ):resonances and γ(DCO) in (^{28}Si,α2pγ); magnetic polarity from no level-parity change determined based on L-transfer data.
		2194.4	21 *4*	4479.98	4⁻			
		2737.8[@]	<5	3936.5	2⁺			
		6673.8[@]	<10	0.0	0⁺			
6681.6	(0,1,2)	947.7	100	5733.9	1⁻			
6772.7	1⁻	2292.6[@]	<10	4479.98	4⁻			
		2836.1	41 *7*	3936.5	2⁺	[E1]		B(E1)(W.u.)>0.0019
		3395.6[@]	<8	3376.9	0⁺			
		4604.9[@]	<10	2167.472	2⁺			
		6772.1	100 *7*	0.0	0⁺	[E1]		B(E1)(W.u.)>0.00038
6824.0	(2⁺,3⁻)	2258.4[@]	<9	4565.5	2⁺			
		2343.9[@]	<3	4479.98	4⁻			
		3013.7	47 *7*	3810.18	3⁻			
		3446.9[@]	<12	3376.9	0⁺			
		4656.2	100 *8*	2167.472	2⁺			
		6823.3[@]	<7	0.0	0⁺			
6824.1	(0⁺ to 4⁺)	2258.5		4565.5	2⁺			
		2887.5		3936.5	2⁺			
		3013.8[@]		3810.18	3⁻			
		4656.3[@]		2167.472	2⁺			
6846	(0⁻ to 4⁻)	1762	100	5083.6	(2)⁻			

From ENSDF

$^{38}_{18}Ar_{20}$-31

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
6852	(1,2$^+$)	2286	33 *10*	4565.5	2$^+$			
		3475	100 *13*	3376.9	0$^+$			
		6851	33 *10*	0.0	0$^+$			
6869.9	(2$^-$,3,4$^+$)	x						I_γ: 30% γ branching is unobserved. Additional information 47.
		1992.8	67 *17*	4877.0	3$^-$			
		2304.3[@]	<13	4565.5	2$^+$			
		2933.3[@]	<13	3936.5	2$^+$			
		3059.6	100 *17*	3810.18	3$^-$			
		3492.8[@]	<27	3376.9	0$^+$			
		4702.1	67 *17*	2167.472	2$^+$			
		6869.2[@]	<30	0.0	0$^+$			
6903.8	2$^-$,3$^-$	2423.7	11 *3*	4479.98	4$^-$			
		2967.2	23 *3*	3936.5	2$^+$	[E1]		B(E1)(W.u.)=0.00063 *+48−24*
		4736.0	100 *4*	2167.472	2$^+$	[E1]		B(E1)(W.u.)=0.00068 *+41−20*
6947.9	(2$^+$)	2070.8[@]	<8	4877.0	3$^-$			
		2382.3[@]	<14	4565.5	2$^+$			
		3137.6[@]	<9	3810.18	3$^-$			
		3570.8	100 *5*	3376.9	0$^+$			I_γ: other: 100 *13* from (α,pγ).
		4780.1	54 *5*	2167.472	2$^+$			I_γ: other: 59 *10* from (α,pγ).
		6947.2[@]	<14	0.0	0$^+$			
7046	(3$^-$,4$^+$)	2566	56 *15*	4479.98	4$^-$			
		3236	100 *9*	3810.18	3$^-$			
		4878	19 *4*	2167.472	2$^+$			
7070.19	(6)$^-$	2483.9 *4*	100 *10*	4585.87	5$^-$	M1+E2	+0.53 *+3−9*	B(M1)(W.u.)=0.020 *+10−5*; B(E2)(W.u.)=3.1 *+17−13* E_γ: weighted average of 2483.9 *6* from (^{28}Si,α2pγ) and 2483.9 *4* from (^{16}O,2pγ). I_γ: from (^{28}Si,α2pγ). Mult.: D+Q from γ(DCO) in (^{28}Si,α2pγ) and γ(θ) in (α,pγ); M2 is ruled out by RUL. δ: from (α,pγ). Other: ≈+0.5 from (^{28}Si,α2pγ).
		2590 *1*	11 *2*	4479.98	4$^-$			E_γ,I_γ: from (^{28}Si,α2pγ).
7100.8	(1$^-$ to 4$^+$)	x						I_γ: 30% γ branching is unobserved. Additional information 48.
		4933.0	100	2167.472	2$^+$			
7128	(1$^-$ to 4$^+$)	3318	100 *10*	3810.18	3$^-$			
		4960	41 *8*	2167.472	2$^+$			
7181	(1,2$^+$)	7180	100	0.0	0$^+$			
7192.2	(2$^-$,3,4)	2315.1	27 *3*	4877.0	3$^-$			

From ENSDF

$^{38}_{18}Ar_{20}$-32

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
7192.2	(2$^-$,3,4)	2626.6[@]	<8	4565.5	2$^+$		
		2712.1	100 *7*	4479.98	4$^-$		
		3255.6[@]	<5	3936.5	2$^+$		
		3381.9	32 *3*	3810.18	3$^-$		
		3815.1[@]	<6	3376.9	0$^+$		
		5024.4[@]	<6	2167.472	2$^+$		
		7191.5[@]	<6	0.0	0$^+$		
7233.8	(1$^-$ to 4$^+$)	5066.0	100	2167.472	2$^+$		
7236	(2$^+$)	x					I_γ: 50% γ absolute branching is unobserved. Additional information 49.
		7235	100 *10*	0.0	0$^+$		
7288.32	6$^+$	879.9 *3*	11 *4*	6408.32	6$^+$		E_γ: from (^{28}Si,α2pγ). I_γ: unweighted average of 15.4 *13* from (^{28}Si,α2pγ) and 7.0 *10* from (α,pγ).
		1236 *1*	5.1 *13*	6053.2	(4$^+$)	[E2]	B(E2)(W.u.)=33 *+53−18* E_γ,I_γ: from (^{28}Si,α2pγ).
		1939.4 *7*	100 *4*	5349.4	4$^+$	E2	B(E2)(W.u.)=7×10^1 *+7−3* E_γ: from (^{28}Si,α2pγ). I_γ: from (α,pγ). Other: 100 *8* from (^{28}Si,α2pγ). Mult.: Q from γ(DCO) in (^{28}Si,α2pγ) and γ(θ) in (α,pγ); M2 is ruled out by RUL.
		2704 *1*	31 *3*	4585.87	5$^-$	[E1]	B(E1)(W.u.)=0.00024 *+29−10* E_γ: from (^{28}Si,α2pγ). I_γ: weighted average of 33.3 *26* from (^{28}Si,α2pγ) and 27 *4* from (α,pγ).
7289.6	(3$^-$,4$^+$)	x					I_γ: 37% γ absolute branching is unobserved. Additional information 50.
		3479.2	100 *8*	3810.18	3$^-$		
7334	(1$^-$ to 4$^+$)	3524	100 *17*	3810.18	3$^-$		I_γ: from (α,pγ) only.
		5166	67 *17*	2167.472	2$^+$		I_γ: from (α,pγ) only.
7350	(3$^-$,4$^+$)	1100	46 *10*	6249.9	2$^+$		E_γ,I_γ: from (α,pγ) only.
		2764	98 *10*	4585.87	5$^-$		E_γ,I_γ: from (α,pγ) only.
		2870	100 *10*	4479.98	4$^-$		E_γ,I_γ: from (α,pγ) only.
7370	(1$^+$)	x					I_γ: 50% γ absolute branching is unobserved. Additional information 51.
		7369	100 *20*	0.0	0$^+$		
7376	(2$^+$,3,4$^+$)	1126	45 *10*	6249.9	2$^+$		E_γ,I_γ: from (α,pγ).
		2027	100 *2*	5349.4	4$^+$		E_γ,I_γ: from (α,pγ).
7431.0	(2$^-$,3,4$^+$)	x					I_γ: 45% γ absolute branching is unobserved. Additional information 52.
		5263.1	100 *9*	2167.472	2$^+$		
7452	(1$^-$ to 4$^+$)	x					I_γ: 25% γ absolute branching is unobserved. Additional information 53.

From ENSDF

$^{38}_{18}Ar_{20}$-33

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.#	Comments
7452	(1$^-$ to 4$^+$)	2575	36 *9*	4877.0	3$^-$		
		5284	100 *9*	2167.472	2$^+$		
7485	(3$^-$,4$^+$)	1826	100	5658.61	5$^-$		
7491.3	(6$^+$)	1438 *1*	100 *8*	6053.2	(4$^+$)		E_γ,I_γ: from (^{28}Si,α2pγ).
		1833 *1*	33 *8*	5658.61	5$^-$		E_γ,I_γ: from (^{28}Si,α2pγ).
		2142 *1*	46 *8*	5349.4	4$^+$		E_γ,I_γ: from (^{28}Si,α2pγ).
7497	(3,4,5$^-$)	x					I_γ: 20% γ absolute branching is unobserved in (α,pγ). Additional information 54.
		1444	100 *10*	6053.2	(4$^+$)		I_γ: from (α,pγ).
		3017	58 *10*	4479.98	4$^-$		I_γ: from (α,pγ).
		3687 *3*	22 *6*	3810.18	3$^-$		E_γ: from (α,γ):resonances. I_γ: from (α,pγ).
7508.12	7$^-$	437.8 *2*	8.8 *11*	7070.19	(6)$^-$	(M1+E2)	E_γ,I_γ: from (^{28}Si,α2pγ) only. Mult.: D+Q with ΔJ=1 in (^{28}Si,α2pγ) based on DCO=0.82 *15*, which however is also consistent with ΔJ=2 or ΔJ=0; ΔJ<2 is also favored by RUL. Note that in (α,pγ), J^π=5$^-$ is assigned to the daughter level at 7070 based on RUL and $\gamma(\theta)$. See comments for 7070 level.
		1100 *1*	2.2 *11*	6408.32	6$^+$		E_γ,I_γ: from (^{28}Si,α2pγ) only.
		1850 *1*	8 *3*	5658.61	5$^-$	[E2]	B(E2)(W.u.)<7.9 E_γ,I_γ: from (^{28}Si,α2pγ). Other: Iγ=3 *2* in (α,pγ), <4 in (^{16}O,2pγ).
		2922.6 *6*	100 *6*	4585.87	5$^-$	E2	B(E2)(W.u.)<7.4 E_γ: unweighted average of 2923 *1* from (^{28}Si,α2pγ), 2923.2 *4* from (^{16}O,2pγ), and 2921.5 *3* from (^{14}N,n2pγ). I_γ: from (^{28}Si,α2pγ). Mult.: from $\gamma(\theta$,pol) in (^{16}O,2pγ), also supported by γ(DCO) in (^{28}Si,α2pγ) and $\gamma(\theta)$ in (^{14}N,n2pγ) and (α,pγ).
7528	(3$^-$ to 7$^-$)	1869	5 *3*	5658.61	5$^-$		E_γ,I_γ: from (α,pγ).
		2942	100 *3*	4585.87	5$^-$		E_γ,I_γ: from (α,pγ).
7539	(3,4,5)	1486		6053.2	(4$^+$)		
		3059		4479.98	4$^-$		
7628?	(1,2$^+$)	7628 *8*		0.0	0$^+$		E_γ: from (α,γ):resonances.
7648?	(1,2$^+$)	7648 *8*		0.0	0$^+$		
7663	(2$^+$ to 6$^+$)	2314	100	5349.4	4$^+$		
7667	(3$^-$ to 7$^-$)	993	52 *9*	6674.4	5$^-$		E_γ,I_γ: from (α,pγ).
		2008	100 *14*	5658.61	5$^-$		E_γ,I_γ: from (α,pγ).
7683	(3$^-$,4$^+$)	3203	100 *11*	4479.98	4$^-$		I_γ: from (α,pγ). Other: 100 *17* from (p,γ):resonances.
		3873	49 *11*	3810.18	3$^-$		I_γ: from (α,pγ). Other: <10 from (p,γ):resonances.
		5515	65 *9*	2167.472	2$^+$		I_γ: weighted average of 64 *9* from (α,pγ) and 67 *17* from (p,γ):resonances.
7702	(1$^+$)	5534	100 *14*	2167.472	2$^+$		E_γ,I_γ: from (α,pγ).
		7701	43 *14*	0.0	0$^+$		E_γ,I_γ: from (α,pγ).

From ENSDF

$^{38}_{18}Ar_{20}$-34

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
7786	(2⁻ to 6⁻)	1744	100 *11*	6041.8	(3⁻,4⁺)			E_γ,I_γ: from (α,pγ).
		3306	85 *11*	4479.98	4⁻			E_γ,I_γ: from (α,pγ).
7828	(1⁻ to 5⁻)	4018	100	3810.18	3⁻			E_γ,I_γ: from (α,pγ).
7857	(1⁻,2⁺)	4047	100 *25*	3810.18	3⁻			E_γ,I_γ: from (α,pγ).
		5689	75 *25*	2167.472	2⁺			E_γ,I_γ: from (α,pγ).
		7856	75 *25*	0.0	0⁺			E_γ,I_γ: from (α,pγ).
7858.9	(6)	1184.5 *4*	100	6674.4	5⁻	D		E_γ,Mult.: from (^{28}Si,α2pγ), Mult=D from γ(DCO).
7893.4	(1⁺,2⁺)	7892.5	100	0.0	0⁺			
7899	(3⁻ to 7⁻)	1225	100	6674.4	5⁻			
7911	(3⁻,4⁺)	2252	81 *8*	5658.61	5⁻			E_γ,I_γ: from (α,pγ).
		2562	58 *8*	5349.4	4⁺			E_γ,I_γ: from (α,pγ).
		3325	42 *8*	4585.87	5⁻			E_γ,I_γ: from (α,pγ).
		3431	100 *12*	4479.98	4⁻			E_γ,I_γ: from (α,pγ).
		4101	85 *12*	3810.18	3⁻			E_γ,I_γ: from (α,pγ).
		5743	19 *8*	2167.472	2⁺			E_γ,I_γ: from (α,pγ).
7992	(1⁻,2,3⁻)	5824	100	2167.472	2⁺			E_γ: other: 5827 *3* from (α,γ):resonances.
8068	(3⁻,4⁺)	2026	100 *20*	6041.8	(3⁻,4⁺)			E_γ,I_γ: from (α,pγ).
		4258	67 *15*	3810.18	3⁻			E_γ,I_γ: from (α,pγ).
8077.20	7⁺	789.3 *6*	7.5 *15*	7288.32	6⁺			E_γ,I_γ: from (^{28}Si,α2pγ). Other: Iγ=7 in (α,pγ).
		1669.0 *3*	100 *3*	6408.32	6⁺	M1+E2	+0.72 *+21−16*	B(M1)(W.u.)=0.026 *+16−10*; B(E2)(W.u.)=17 *+15−8* E_γ: weighted average of 1669.4 *4* from (^{28}Si,α2pγ), 1669.2 *3* from (^{16}O,2pγ), and 1668.3 *4* from (^{14}N,n2pγ). I_γ: from (^{28}Si,α2pγ). Mult.: D+Q with ΔJ=1 from γ(DCO) in (^{28}Si,α2pγ) and γ(θ) in (α,pγ); M2 ruled out by RUL. δ: from γ(θ) in (α,pγ).
8106	(0⁺ to 4⁺)	5938	100	2167.472	2⁺			
8124	(3⁻ to 6⁺)	1450	37 *5*	6674.4	5⁻			E_γ,I_γ: from (α,pγ).
		2774	24 *5*	5349.4	4⁺			E_γ,I_γ: from (α,pγ) only.
		3538	100 *6*	4585.87	5⁻			E_γ,I_γ: from (α,pγ).
8125.0	(6⁻)	1055 *1*	64 *14*	7070.19	(6)⁻	(M1+E2)	+0.9 *+7−2*	E_γ,I_γ: from (^{28}Si,α2pγ) considered for a doublet; also reported in (α,pγ). Mult.,δ: D+Q from γ(θ) in (α,pγ). Other: Mult=D from γ(DCO) in (^{28}Si,α2pγ), giving possible ΔJ=0.
		1451 *1*	29 *7*	6674.4	5⁻			E_γ,I_γ: from (^{28}Si,α2pγ), not reported in (α,pγ); a similar γ is placed from 8124 level in the latter.
		3538 *2*	100 *14*	4585.87	5⁻			E_γ,I_γ: from (^{28}Si,α2pγ), not reported in (α,pγ); a similar γ is placed from 8124 level in the latter.
8181	(3⁻,4⁺)	6013	100	2167.472	2⁺			
8215	(3⁻ to 7⁻)	1541	35 *7*	6674.4	5⁻			E_γ: from (α,pγ).
		2556	100 *8*	5658.61	5⁻			E_γ: from (α,pγ).

From ENSDF

$^{38}_{18}Ar_{20}$-35

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
8233	(1$^-$)	8232	100	0.0	0$^+$			
8261	(3$^-$ to 6$^-$)	2602	89 *6*	5658.61	5$^-$			E_γ,I_γ: from (α,pγ).
		3675	100 *6*	4585.87	5$^-$			E_γ,I_γ: from (α,pγ).
		3781	33 *4*	4479.98	4$^-$			E_γ,I_γ: from (α,pγ).
8311	(1$^+$)	4501	100 *25*	3810.18	3$^-$			
		6143	89 *25*	2167.472	2$^+$			
8353	(1,2$^+$)	3787	80 *22*	4565.5	2$^+$			E_γ,I_γ: from (α,pγ).
		6185	100 *4*	2167.472	2$^+$			E_γ,I_γ: from (α,pγ).
		8352	42 *20*	0.0	0$^+$			E_γ,I_γ: from (α,pγ).
8391	(2$^+$)	8390	100	0.0	0$^+$			
8417	(3$^-$ to 7$^-$)	2758	100	5658.61	5$^-$			
8481	(3$^-$ to 6$^-$)	3895	100 *10*	4585.87	5$^-$			E_γ,I_γ: from (α,pγ).
		4001	100 *10*	4479.98	4$^-$			E_γ,I_γ: from (α,pγ).
8491.1	(6$^-$)	1420.9 *3*	100	7070.19	(6)$^-$	D+Q		E_γ: weighted average of 1421.0 *4* from (^{28}Si,α2pγ) and 1420.8 *3* from (^{16}O,2pγ). Mult.,δ: δ(Q/D)=+1.1 +*5*−*4* from γ(θ) data in (α,pγ) if 1420.9γ is a ΔJ=0 transition. γ(θ) data giving positive A_2 and negative A_4 is consistent with ΔJ=0 or 2; γ(DCO) in (^{28}Si,α2pγ) is consistent ΔJ=1, but for large D+Q admixture, it can also be consistent with ΔJ=0.
8517	(1,2$^+$)	6349	100 *19*	2167.472	2$^+$			E_γ,I_γ: from (α,pγ).
		8516	11 *9*	0.0	0$^+$			E_γ,I_γ: from (α,pγ).
8520	(3$^-$ to 6$^-$)	3934	61 *6*	4585.87	5$^-$			E_γ,I_γ: from (α,pγ).
		4040	100 *13*	4479.98	4$^-$			E_γ,I_γ: from (α,pγ).
8569.59	8$^+$	492.55 *25*	13.1 *9*	8077.20	7$^+$	M1(+E2)	>−0.09	E_γ: weighted average of 492.6 *2* from (^{28}Si,α2pγ), 492.7 *2* from (^{16}O,2pγ), and 492.25 *25* from (^{14}N,n2pγ). I_γ: weighted average of 12.7 *7* from (^{28}Si,α2pγ), 21 *4* from (^{16}O,2pγ), 14 *4* from (^{14}N,n2pγ), and 18 *4* from (α,pγ). Mult.,δ: from γ(θ,pol) in (^{16}O,2pγ), also supported by γ(DCO) in (^{28}Si,α2pγ).
		1061.4 *2*	23.7 *13*	7508.12	7$^-$	(E1)		E_γ: weighted average of 1061.4 *3* from (^{28}Si,α2pγ), 1061.5 *2* from (^{16}O,2pγ), and 1061.2 *3* from (^{14}N,n2pγ). I_γ: weighted average of 24.3 *7* from (^{28}Si,α2pγ), 21 *6* from (^{16}O,2pγ), 14 *4* from (^{14}N,n2pγ), and 18 *3* from (α,pγ). Mult.: D from γ(DCO) in (^{28}Si,α2pγ) for a doublet structure; polarity from level scheme.
		1282 *1*	1.0 *3*	7288.32	6$^+$			E_γ,I_γ: from (^{28}Si,α2pγ) only.
		2161.0 *3*	100 *4*	6408.32	6$^+$	E2		E_γ: weighted average of 2162 *1* from (^{28}Si,α2pγ), 2160.6 *2* from (^{16}O,2pγ), and 2161.30 *20* from (^{14}N,n2pγ).

From ENSDF

$^{38}_{18}Ar_{20}$-36

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
								E_γ: weighted average of 2162 *1* from (^{28}Si,α2pγ), 2160.6 *2* from (^{16}O,2pγ), and 2161.30 *20* from (^{14}N,n2pγ). I_γ: from (^{14}N,n2pγ). Mult.: from γ(θ,pol) in (^{16}O,2pγ), γ(DCO) in (^{28}Si,α2pγ) and γ(θ) in (^{14}N,n2pγ).
8595	(3$^-$ to 7$^-$)	2936	100 *20*	5658.61	5$^-$			E_γ,I_γ: from (α,pγ).
		4009	100 *20*	4585.87	5$^-$			E_γ,I_γ: from (α,pγ).
8650	(3$^-$ to 6$^+$)	2597	25 *6*	6053.2	(4$^+$)			E_γ,I_γ: from (α,pγ).
		2991	100 *11*	5658.61	5$^-$			E_γ,I_γ: from (α,pγ).
8668	2$^+$	3791	100 *30*	4877.0	3$^-$			E_γ,I_γ: from (α,pγ).
		6500	100 *30*	2167.472	2$^+$			E_γ,I_γ: from (α,pγ).
8783	(3$^-$ to 7$^-$)	3124	100	5658.61	5$^-$			
8789	(4$^-$ to 7$^-$)	1719	100 *15*	7070.19	(6)$^-$			E_γ,I_γ: from (α,pγ).
		2115	54 *15*	6674.4	5$^-$			E_γ,I_γ: from (α,pγ).
8800	(2$^-$ to 6$^-$)	2758	100	6041.8	(3$^-$,4$^+$)			
8809	(4$^+$ to 8$^+$)	2401	100	6408.32	6$^+$			
8828	(3$^-$ to 7$^-$)	4242	100	4585.87	5$^-$			
8875	(3$^-$ to 6$^-$)	3216	50 *10*	5658.61	5$^-$			E_γ,I_γ: from (α,pγ).
		4289	50 *10*	4585.87	5$^-$			E_γ,I_γ: from (α,pγ).
		4395	100 *20*	4479.98	4$^-$			E_γ,I_γ: from (α,pγ).
8944	(4$^+$ to 7$^-$)	2536	35 *7*	6408.32	6$^+$			E_γ,I_γ: from (α,pγ).
		3285	100 *9*	5658.61	5$^-$			E_γ,I_γ: from (α,pγ).
8956	(4$^-$ to 7$^-$)	1886	72 *10*	7070.19	(6)$^-$			E_γ,I_γ: from (α,pγ).
		4370	100 *10*	4585.87	5$^-$			E_γ,I_γ: from (α,pγ).
8972.85	7$^-$	847.8 *4*	3.3 *8*	8125.0	(6$^-$)			E_γ,I_γ: from (^{28}Si,α2pγ) only.
		1903 *1*	3.3 *8*	7070.19	(6)$^-$			E_γ,I_γ: from (^{28}Si,α2pγ) only.
		2300 *1*	9.2 *17*	6674.4	5$^-$	(E2)		E_γ,I_γ: from (^{28}Si,α2pγ) only. Mult.: Q from γ(DCO) in (^{28}Si,α2pγ) for a doublet structure; polarity from level scheme.
		2564.4 *4*	100 *8*	6408.32	6$^+$	E1+M2	−0.04 *2*	E_γ: weighted average of 2565 *1* from (^{28}Si,α2pγ), 2564.5 *4* from (^{16}O,2pγ), and 2564.0 *5* from (^{14}N,n2pγ). I_γ: from (^{16}O,2pγ) and (^{28}Si,α2pγ). Mult.,δ: from γ(θ,pol) in (^{16}O,2pγ), also supported by γ(DCO) in (^{28}Si,α2pγ) and γ(θ) in (^{14}N,n2pγ).
		3313.4 *7*	20.3 *13*	5658.61	5$^-$	(E2)		E_γ: weighted average of 3314 *1* from (^{28}Si,α2pγ) and 3313.1 *7* from (^{14}N,n2pγ). I_γ: weighted average of 20.8 *8* from (^{28}Si,α2pγ), 13 *3* from (^{16}O,2pγ), 29 *9* from (^{14}N,n2pγ), and 15 *6* from (α,pγ). Mult.: Q from γ(DCO) in (^{28}Si,α2pγ); polarity from level scheme.
		4386.2 *4*	36 *3*	4585.87	5$^-$	E2		E_γ: weighted average of 4388 *2* from (^{28}Si,α2pγ), 4386.2 *4* from

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$^{38}_{18}Ar_{20}$-37

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
							(^{16}O,2pγ), and 4386.1 *5* from (^{14}N,n2pγ). I_γ: weighted average of 34.2 *17* from (^{28}Si,α2pγ), 51 *8* from (^{16}O,2pγ), and 47 *6* from (α,pγ). Other: 93 *18* from (^{14}N,n2pγ). Mult.: from γ(θ,pol) in (^{16}O,2pγ) and γ(DCO) in (^{28}Si,α2pγ).
8998	(4$^+$,5,6$^-$)	2590		6408.32	6$^+$		
9072	(4$^-$,5,6$^+$)	1722	65 *12*	7350	(3$^-$,4$^+$)		E_γ,I_γ: from (α,pγ).
		2002	100 *14*	7070.19	(6)$^-$		E_γ,I_γ: from (α,pγ).
		2398	67 *12*	6674.4	5$^-$		E_γ,I_γ: from (α,pγ).
9077	(1$^-$ to 5$^-$)	4200	100	4877.0	3$^-$		
9087	(3$^-$ to 7$^-$)	3428	100 *15*	5658.61	5$^-$		E_γ,I_γ: from (α,pγ).
		4501	37 *5*	4585.87	5$^-$		E_γ,I_γ: from (α,pγ).
9100	(1,2$^+$)	9099	100	0.0	0$^+$		
9158	(0$^+$ to 4$^+$)	6990	100	2167.472	2$^+$		
9170	(3$^-$ to 6$^-$)	4584	100 *12*	4585.87	5$^-$		E_γ,I_γ: from (α,pγ).
		4690	100 *12*	4479.98	4$^-$		E_γ,I_γ: from (α,pγ).
9199	(4$^-$ to 8$^-$)	1074	100	8125.0	(6$^-$)		
9204	(0$^+$ to 4$^+$)	7036	100	2167.472	2$^+$		
9260	(0$^+$ to 4$^+$)	7092	100	2167.472	2$^+$		
9293	(3$^-$ to 7$^-$)	4707	100	4585.87	5$^-$		
9300	(0$^+$ to 4$^+$)	7132	100	2167.472	2$^+$		
9330	(4$^+$ to 8$^+$)	2922	100	6408.32	6$^+$		
9339.2	8$^+$	1848 *1*	16.5 *25*	7491.3	(6$^+$)	[E2]	B(E2)(W.u.)=5.6 *+33−20* E_γ,I_γ: from (^{28}Si,α2pγ).
		2051.3 *6*	100 *8*	7288.32	6$^+$	E2	B(E2)(W.u.)=20 *+8−5* E_γ,I_γ: from (^{28}Si,α2pγ). Mult.: Q from γ(DCO) in (^{28}Si,α2pγ), M2 ruled out by RUL.
		2931 *1*	24.1 *25*	6408.32	6$^+$	[E2]	B(E2)(W.u.)=0.8 *+5−3* E_γ,I_γ: from (^{28}Si,α2pγ).
9349.6	(7$^-$)	2941 *2*	80 *20*	6408.32	6$^+$		E_γ,I_γ: from (^{28}Si,α2pγ).
		3691 *2*	60 *20*	5658.61	5$^-$		E_γ,I_γ: from (^{28}Si,α2pγ). Other: Iγ=222 *38* in (α,pγ).
		4764 *3*	100 *20*	4585.87	5$^-$		E_γ,I_γ: from (^{28}Si,α2pγ). Other: Iγ=100 *29* in (α,pγ).
9374	(3$^-$ to 7$^-$)	4788	100	4585.87	5$^-$		
9437	(3$^-$ to 7$^-$)	3778	100	5658.61	5$^-$		
9460	(3$^-$ to 7$^-$)	4874	100	4585.87	5$^-$		
9537.0	8$^{(+)}$	967.4 *3*	79 *7*	8569.59	8$^+$	D	E_γ,I_γ: from (^{28}Si,α2pγ). Other: Iγ=118 *20* in (α,pγ). Mult.: ΔJ=0 from γ(DCO) in (^{28}Si,α2pγ).
		2046 *1*	57 *14*	7491.3	(6$^+$)		E_γ,I_γ: from (^{28}Si,α2pγ).
		2248 *1*	57 *22*	7288.32	6$^+$		E_γ,I_γ: from (^{28}Si,α2pγ).
		3128 *2*	100 *14*	6408.32	6$^+$		E_γ,I_γ: from (^{28}Si,α2pγ). Other: Iγ=100 *26* in (α,pγ).
9597	1$^-$	9596	100	0.0	0$^+$	E1	Mult.: D from γ(θ) in (α,γ):resonances, electric polarity from E1 excitation in (e,e′).

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

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
9644	(5$^-$ to 9$^-$)	2136	100	7508.12	7$^-$			
9647	(2$^-$ to 6$^-$)	3045	100	6601.59	4$^-$			
9655	(3$^-$ to 7$^-$)	3996	100	5658.61	5$^-$			
9669	(3$^-$ to 7$^-$)	4010	100	5658.61	5$^-$			
9689	1$^-$	x						I_γ: 20% γ absolute branching is unobserved in (α,γ):resonances. Additional information 55.
		5752	26 *5*	3936.5	2$^+$	(E1(+M2))	+0.07 *+9−12*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances, polarity from level-parity change determined based on the fact that only natural-parity resonant states can be populated.
		6312	63 *11*	3376.9	0$^+$			E_γ,I_γ: from (α,γ):resonances.
		7521	18 *5*	2167.472	2$^+$			E_γ,I_γ: from (α,γ):resonances.
		9688	100 *13*	0.0	0$^+$	(E1)		E_γ,I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances, electric polarity determined based on the fact that only natural-parity resonant states can be populated.
9797	3$^-$	x						I_γ: 35% γ absolute branching is unobserved in (α,γ):resonances. Additional information 56.
		5231	26 *8*	4565.5	2$^+$			E_γ,I_γ: from (α,γ):resonances.
		5860	100 *10*	3936.5	2$^+$	(E1)		E_γ,I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
		5986	18 *8*	3810.18	3$^-$			E_γ,I_γ: from (α,γ):resonances.
		7629	23 *8*	2167.472	2$^+$			E_γ,I_γ: from (α,γ):resonances.
9811	1$^-$	6434	9.1 *13*	3376.9	0$^+$			E_γ,I_γ: from (α,γ):resonances.
		7643	4.6 *23*	2167.472	2$^+$			E_γ,I_γ: from (α,γ):resonances.
		9810	100 *10*	0.0	0$^+$	(E1)		E_γ,I_γ: from (α,γ):resonances. Mult.: from γ(θ) in (α,γ):resonances.
9829	(4$^-$ to 8$^-$)	2759	100	7070.19	(6)$^-$			
9894	2$^+$	x						I_γ: 12% γ absolute branching is unobserved in (α,γ):resonances. Additional information 57.
		4160	40 *8*	5733.9	1$^-$			E_γ,I_γ: from (α,γ):resonances.
		4342	20 *4*	5552.21	1$^+$,2$^+$			E_γ,I_γ: from (α,γ):resonances.
		5328	48 *8*	4565.5	2$^+$	(M1+E2)	+0.18 *13*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		5957	28 *4*	3936.5	2$^+$	(M1+E2)	+0.84 *+27−21*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		6083	72 *8*	3810.18	3$^-$	(E1+M2)	−0.11 *7*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		7726	100 *8*	2167.472	2$^+$	(M1+E2)	−0.27 *6*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		9893	44 *8*	0.0	0$^+$	(E2)		E_γ,I_γ: from (α,γ):resonances. Mult.: Q from γ(θ) in (α,γ):resonances.

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$^{38}_{18}Ar_{20}$-39

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
9917	1⁻	5351		4565.5	2⁺			
		5980		3936.5	2⁺			
		6106		3810.18	3⁻			
		7749		2167.472	2⁺			
		9916	100	0.0	0⁺	(E1)		Mult.: D from γ(θ) in (α,γ):resonances.
9934.0	(9⁺)	1364 *1*	100	8569.59	8⁺	D+Q		E_γ: from (^{28}Si,α2pγ). Mult.: ΔJ=1 from γ(DCO) in (^{28}Si,α2pγ) for a doublet structure.
9951	2⁺	x						I_γ: 14% γ absolute branching is unobserved in (α,γ):resonances. Additional information 58.
		6014	57 *8*	3936.5	2⁺	(M1+E2)	+1.4 *+4−3*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		6140	70 *8*	3810.18	3⁻	(E1(+M2))	+0.07 *+9−12*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances.
		7783	100 *8*	2167.472	2⁺	(M1+E2)	+1.19 *+30−8*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
9996	1⁻	9995	100	0.0	0⁺	(E1)		Mult.: D from γ(θ) in (α,γ):resonances.
10024.9	(8⁻)	1900 *1*	100 *13*	8125.0	(6⁻)	Q		E_γ,I_γ: from (^{28}Si,α2pγ).
		1948 *1*	38 *8*	8077.20	7⁺			E_γ,I_γ: from (^{28}Si,α2pγ).
		2517 *1*	46 *8*	7508.12	7⁻			E_γ,I_γ: from (^{28}Si,α2pγ).
		2956 *2*	54 *8*	7070.19	(6)⁻			E_γ,I_γ: from (^{28}Si,α2pγ).
10034	1⁻	10033	100	0.0	0⁺	(E1)		Mult.: D from γ(θ) in (α,γ):resonances.
10047	(1⁻)	x						I_γ: 47% γ absolute branching is unobserved in (α,γ):resonances. Additional information 59.
		5481	100	4565.5	2⁺			E_γ,I_γ: from (α,γ):resonances.
		6110	54	3936.5	2⁺			E_γ,I_γ: from (α,γ):resonances.
		7879	36	2167.472	2⁺			E_γ,I_γ: from (α,γ):resonances.
10067	3⁻	x						I_γ: 45% γ absolute branching is unobserved in (α,γ):resonances. Additional information 60.
		3853	42 *5*	6213.8	(2⁺)	D(+Q)	+0.05 *8*	E_γ,I_γ: from (α,γ):resonances. Mult.: from γ(θ) in (α,γ):resonances.
		4983[@]	<16	5083.6	(2)⁻			E_γ,I_γ: from (α,γ):resonances.
		5501	74 *5*	4565.5	2⁺	(E1+M2)	−0.09 *4*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		5587	42 *5*	4479.98	4⁻	(M1+E2)		E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances, δ=−0.27 *+10−20* or −2.9 *+9−8*.
		6130	16 *5*	3936.5	2⁺	(E1+M2)		E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances, δ=−0.02 *4* or −2.9 *+5−11*.
		7899	100 *10*	2167.472	2⁺			E_γ,I_γ: from (α,γ):resonances.
10101	(3⁻ to 7⁻)	4442	100 *12*	5658.61	5⁻			E_γ,I_γ: from (α,pγ).
		5515	69 *12*	4585.87	5⁻			E_γ,I_γ: from (α,pγ).

From ENSDF

$^{38}_{18}Ar_{20}$-40

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
10112	(4$^+$ to 8$^+$)	3703	100	6408.32	6$^+$			
10120	(6,7,8)	2043	100 *5*	8077.20	7$^+$			E_γ,I_γ: from (α,pγ).
		2612	28 *5*	7508.12	7$^-$			E_γ,I_γ: from (α,pγ).
10135	(5$^-$ to 9$^-$)	2627	100	7508.12	7$^-$			
10146	2$^+$	x						I_γ: 27% γ absolute branching is unobserved in (α,γ):resonances. Additional information 61.
		7978	100 *6*	2167.472	2$^+$	(M1(+E2))	−0.05 *4*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances.
		10145	7 *3*	0.0	0$^+$	(E2)		E_γ,I_γ: from (α,γ):resonances. Mult.: Q from γ(θ) in (α,γ):resonances.
10170	3$^-$	x						I_γ: 27% γ absolute branching is unobserved in (α,γ):resonances. Additional information 62.
		5604	19 *3*	4565.5	2$^+$	(E1(+M2))	−0.04 *+8−5*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances.
		5690	49 *5*	4479.98	4$^-$	(M1+E2)		E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances, δ=−0.14 *5* or −4.3 *+6−8*.
		6233	30 *5*	3936.5	2$^+$	(E1)		E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D from γ(θ) in (α,γ):resonances.
		8002	100 *8*	2167.472	2$^+$	(E1(+M2))	+0.05 *4*	E_γ,I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances.
10174.29	9$^-$	835.3 *4*	3.7 *11*	9339.2	8$^+$	[E1]		B(E1)(W.u.)=7×10^{-6} *+5−3* E_γ,I_γ: from (^{28}Si,α2pγ) only.
		1201.32 *20*	88 *6*	8972.85	7$^-$	E2		B(E2)(W.u.)=4.9 *+15−10* E_γ: weighted average of 1201.8 *3* from (^{28}Si,α2pγ), 1201.17 *21* from (^{16}O,2pγ), and 1201.24 *20* from (^{14}N,n2pγ). I_γ: weighted average of 74 *5* from (^{28}Si,α2pγ), 93 *4* from (^{16}O,2pγ), 92 *8* from (^{14}N,n2pγ), and 100 *10* from (α,pγ). Mult.: from γ(θ,pol) in (^{16}O,2pγ) and γ(DCO) in (^{28}Si,α2pγ).
		1604.67 *16*	100 *4*	8569.59	8$^+$	E1+M2	−0.04 *2*	B(E1)(W.u.)=2.7×10^{-5} *+8−6*; B(M2)(W.u.)=0.08 *+15−6* E_γ: weighted average of 1605.4 *4* from (^{28}Si,α2pγ), 1604.68 *11* from (^{16}O,2pγ), and 1604.32 *25* from (^{14}N,n2pγ). I_γ: from (^{16}O,2pγ). Mult.,δ: from γ(θ,pol) in (^{16}O,2pγ), ΔJ=1 from γ(DCO) in (^{28}Si,α2pγ).
10181	(5$^-$ to 9$^-$)	2673	100	7508.12	7$^-$			
10184	1$^-$	8016		2167.472	2$^+$			E_γ: 8027 *8* from (α,γ):resonances.
		10183	100	0.0	0$^+$	(E1)		B(E1)(W.u.)=3.0×10^{-5} *+33−10* Mult.: D from γ(θ) in (α,γ):resonances.
10217	(0$^+$ to 4$^+$)	x						I_γ: 35% γ absolute branching is unobserved in (α,γ):resonances. Additional information 63.

From ENSDF

$^{38}_{18}Ar_{20}$-41

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
10217	(0^+ to 4^+)	5651	100	4565.5	2^+		I_γ: from (α,γ):resonances.
		8049	89	2167.472	2^+		I_γ: from (α,γ):resonances.
10245	(5^- to 8^-)	1754	100 *8*	8491.1	(6^-)		I_γ: from (α,pγ).
		2737	59 *8*	7508.12	7^-		I_γ: from (α,pγ).
10245	(0^+ to 4^+)	6308		3936.5	2^+		
		8077		2167.472	2^+		
10255	1^-	x					I_γ: 10% γ absolute branching is unobserved in (α,γ):resonances. Additional information 64.
		6877	23 *3*	3376.9	0^+		I_γ: from (α,γ):resonances.
		8087	13.6 *15*	2167.472	2^+		I_γ: from (α,γ):resonances.
		10254	100 *6*	0.0	0^+	(E1)	I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
10274	(4^+ to 8^+)	2986	100	7288.32	6^+		
10316	(3^- to 7^-)	5730	100	4585.87	5^-		
10335	1^-	x					I_γ: 23% γ absolute branching is unobserved. Additional information 65.
		6398	13	3936.5	2^+		I_γ: from (α,γ):resonances.
		6957	13	3376.9	0^+		I_γ: from (α,γ):resonances.
		10333	100	0.0	0^+	(E1)	I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
10382	(1^- to 4^+)	6571	25	3810.18	3^-		I_γ: from (α,γ):resonances.
		8214	100	2167.472	2^+		I_γ: from (α,γ):resonances.
10398	1^-	2405 *1*		7992	(1^-,2,3^-)		E_γ: from (α,γ):resonances.
		5918	6 *4*	4479.98	4^-		E_γ: γ to 4^- is suspect from RUL (evaluator).
		6456 *8*		3936.5	2^+		
		7017 *8*	10 *3*	3376.9	0^+	[E1]	B(E1)(W.u.)=1.1×10^{-5} *+210−8* E_γ,I_γ: from (α,γ):resonances.
		8233 *8*	10 *3*	2167.472	2^+	[E1]	B(E1)(W.u.)=7×10^{-6} *+130−5* E_γ,I_γ: from (α,γ):resonances.
		10400 *8*	100 *20*	0.0	0^+	(E1)	E_γ,I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
10431	1^-	2803[@]		7628?	($1,2^+$)		
		5273	1.1 *6*	5157.3	2^+	[E1]	B(E1)(W.u.)=1.6×10^{-6} *+43−12* I_γ: from (α,γ):resonances.
		5865	2.2 *11*	4565.5	2^+	[E1]	B(E1)(W.u.)=2.3×10^{-6} *+58−17* I_γ: from (α,γ):resonances.
		8263	5 *3*	2167.472	2^+	[E1]	B(E1)(W.u.)=1.9×10^{-6} *+49−15* I_γ: from (α,γ):resonances.
		10429	100 *20*	0.0	0^+	(E1)	B(E1)(W.u.)=1.9×10^{-5} *+18−7* I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.

From ENSDF

$^{38}_{18}Ar_{20}$-42

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
10443	(4$^+$ to 8$^+$)	3155	100	7288.32	6$^+$		
10455	(5$^-$ to 8$^+$)	1964	100 *12*	8491.1	(6$^-$)		I_γ: from (α,pγ).
		2947	100 *17*	7508.12	7$^-$		I_γ: from (α,pγ).
		4046	76 *14*	6408.32	6$^+$		I_γ: from (α,pγ).
10494	1$^-$	6557	25 *6*	3936.5	2$^+$		I_γ: from (α,γ):resonances.
		8326	54 *11*	2167.472	2$^+$		I_γ: from (α,γ):resonances.
		10492	100 *20*	0.0	0$^+$		I_γ: from (α,γ):resonances.
10507	(1,2$^+$)	8339	100 *20*	2167.472	2$^+$		I_γ: from (α,γ):resonances.
		10505	45 *9*	0.0	0$^+$		I_γ: from (α,γ):resonances.
10516	(0$^+$)	5950	17 *4*	4565.5	2$^+$		I_γ: from (α,γ):resonances.
		6579	13 *4*	3936.5	2$^+$		I_γ: from (α,γ):resonances.
		6705	100 *21*	3810.18	3$^-$		I_γ: from (α,γ):resonances.
		8348	59 *11*	2167.472	2$^+$		I_γ: from (α,γ):resonances.
10547	(0$^+$)	6610	100 *21*	3936.5	2$^+$		I_γ: from (α,γ):resonances.
		6736	86 *19*	3810.18	3$^-$		I_γ: from (α,γ):resonances.
		8379	18 *4*	2167.472	2$^+$		I_γ: from (α,γ):resonances.
10557	(5$^-$ to 9$^-$)	3049	100	7508.12	7$^-$		
10587	1$^-$	4992	1.1 *6*	5594.6	2$^+$	[E1]	B(E1)(W.u.)=2.6×10^{-6} *+105−20* I_γ: from (α,γ):resonances.
		5503		5083.6	(2)$^-$		E_γ: 5506 *3* in (α,γ):resonances.
		5877[@]	<1	4709.3	0$^+$		I_γ: from (α,γ):resonances.
		6650	2.2 *12*	3936.5	2$^+$	[E1]	B(E1)(W.u.)=2.2×10^{-6} *+87−17* E_γ: 6664 *8* in (α,γ):resonances. I_γ: from (α,γ):resonances.
		6776		3810.18	3$^-$	[E2]	E_γ: 6783 *8* in (α,γ):resonances. I_γ: from (α,γ):resonances.
		8419	10.2 *23*	2167.472	2$^+$	[E1]	B(E1)(W.u.)=5×10^{-6} *+14−3* E_γ: 8415 *10* in (α,γ):resonances. I_γ: from (α,γ):resonances.
		10585	100 *21*	0.0	0$^+$	(E1)	B(E1)(W.u.)=2.5×10^{-5} *+42−11* I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
10589	(4$^+$ to 7$^-$)	2464	26 *6*	8125.0	(6$^-$)		I_γ: from (α,pγ).
		4180	100 *14*	6408.32	6$^+$		I_γ: from (α,pγ).
		6003	74 *14*	4585.87	5$^-$		I_γ: from (α,pγ).
10611	(1$^-$ to 4$^+$)	5097	7 *4*	5513.3	3$^-$		I_γ: from (α,γ):resonances.
		5453	4 *3*	5157.3	2$^+$		I_γ: from (α,γ):resonances.
		6674	23 *5*	3936.5	2$^+$		I_γ: from (α,γ):resonances.
		8443	100 *20*	2167.472	2$^+$		I_γ: from (α,γ):resonances.
10631.3	(2$^-$)	4773.5		5857.5	(2)$^-$		
		5547.3		5083.6	(2)$^-$		

From ENSDF

$^{38}_{18}Ar_{20}$-43

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
10634	(6^+ to 10^+)	2064		8569.59	8^+		
10666	(1^-,2^+,3^-,4^+)	6100	16 *4*	4565.5	2^+		I_γ: from (α,γ):resonances.
		6729	35 *8*	3936.5	2^+		I_γ: from (α,γ):resonances.
		6855	45 *10*	3810.18	3^-		I_γ: from (α,γ):resonances.
		8498	100 *20*	2167.472	2^+		I_γ: from (α,γ):resonances.
10676	(4^+ to 8^+)	4267	100	6408.32	6^+		
10684	1^-	4950	10	5733.9	1^-		I_γ: from (α,γ):resonances.
		10682	100	0.0	0^+	(E1)	I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
10726	(1^- to 4^+)	5173	19 *4*	5552.21	1^+,2^+		I_γ: from (α,γ):resonances.
		5212	19 *4*	5513.3	3^-		I_γ: from (α,γ):resonances.
		6915	51 *11*	3810.18	3^-		I_γ: from (α,γ):resonances.
		8557	100 *21*	2167.472	2^+		I_γ: from (α,γ):resonances.
10768	2^+	5610	13	5157.3	2^+		I_γ: from (α,γ):resonances.
		5684	19 *4*	5083.6	$(2)^-$		I_γ: from (α,γ):resonances.
		5891	8 *4*	4877.0	3^-		I_γ: from (α,γ):resonances.
		8599	100 *21*	2167.472	2^+		I_γ: from (α,γ):resonances.
		10766	49 *10*	0.0	0^+		I_γ: from (α,γ):resonances.
10803	2^+	5645	37 *7*	5157.3	2^+		I_γ: from (α,γ):resonances.
		6237	93 *20*	4565.5	2^+		I_γ: from (α,γ):resonances.
		6992	57 *13*	3810.18	3^-		I_γ: from (α,γ):resonances.
		8634	100 *20*	2167.472	2^+		I_γ: from (α,γ):resonances.
		10801	47 *10*	0.0	0^+	(E2)	I_γ: from (α,γ):resonances. Mult.: Q from γ(θ) in (α,γ):resonances.
10815.6	(0 to 3^-)	x					I_γ: 27% γ absolute branching is unobserved in (p,γ):resonances. Additional information 66.
		4042.7	9	6772.7	1^-		
		4241.0	34	6574.3	1^-		
		4461.8	100	6353.5	1^-		
		5081.3	23	5733.9	1^-		
		6249.5[@]	<1.6	4565.5	2^+		
		6878.4[@]	<1.6	3936.5	2^+		
		7004.7[@]	<2.3	3810.18	3^-		
		7437.9[@]	<2.3	3376.9	0^+		
		8647.1[@]	<5	2167.472	2^+		
		10813.9[@]	<2	0.0	0^+		
10827.0	(2)	x					I_γ: 40% γ absolute branching is unobserved in (p,γ):resonances. Additional information 67.
		3591	28	7236	(2^+)		
		4252.4	17	6574.3	1^-		

From ENSDF

$^{38}_{18}Ar_{20}$-44

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Comments
10827.0	(2)	4341.3	19	6485.4	$(1^-,2,3^-)$	
		4576.8	47	6249.9	2^+	
		4612.9	100	6213.8	(2^+)	
		5232.0	27	5594.6	2^+	
		5313.3	15	5513.3	3^-	
		5669.2	37	5157.3	2^+	
		5949.5	41	4877.0	3^-	
		6260.9[@]	<4	4565.5	2^+	
		6346.5	13	4479.98	4^-	
		6889.8	23	3936.5	2^+	
		7016.1	17	3810.18	3^-	
		7449.3[@]	<5	3376.9	0^+	
		8658.5	9	2167.472	2^+	
		10825.3	6.7	0.0	0^+	
10850.1	$(2^-,3^-)$	x				I_γ: 15% γ absolute branching is unobserved in (p,γ):resonances. Additional information 68.
		2956.6	7.0	7893.4	$(1^+,2^+)$	
		3167	2.6	7683	$(3^-,4^+)$	
		3398	10.4	7452	$(1^-$ to $4^+)$	
		3902.0	4.1	6947.9	(2^+)	
		3946.1	28	6903.8	$2^-,3^-$	
		4025.9	8.9	6824.0	$(2^+,3^-)$	
		4168.3	3.3	6681.6	(0,1,2)	
		4275.5	26	6574.3	1^-	
		4354.0	3.3	6495.8	$(2^-,3^-)$	
		4364.4	8.9	6485.4	$(1^-,2,3^-)$	
		4511.2	18.9	6338.6	$1^-,2^-,3^-$	
		4599.9	13.3	6249.9	2^+	
		4640.4	4.1	6209.4	4^-	
		4808.0	3.3	6041.8	$(3^-,4^+)$	
		4992.2	15.9	5857.5	$(2)^-$	
		5024.8	4.1	5824.9	3^-	
		5115.8	10.7	5733.9	1^-	
		5336.4	7.8	5513.3	3^-	
		5692.3	3.3	5157.3	2^+	
		5766.0	6.7	5083.6	$(2)^-$	
		5972.6	8.9	4877.0	3^-	
		6284.0	3.7	4565.5	2^+	
		6369.5[@]	<1.1	4479.98	4^-	
		6912.9	5.9	3936.5	2^+	
		7039.2	5.9	3810.18	3^-	

From ENSDF

$^{38}_{18}Ar_{20}$-45

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	Comments
10850.1	$(2^-,3^-)$	7472.4[@]	<1.5	3376.9	0^+		
		8681.6	100	2167.472	2^+		
		10848.4[@]	<0.7	0.0	0^+		
10857	1^-	10855	100	0.0	0^+	(E1)	Mult.: D from $\gamma(\theta)$ in (α,γ):resonances.
10873.8	$(0^+$ to $3^-)$	x					I_γ: 27% γ absolute branching is unobserved in (p,γ):resonances. Additional information 69.
		3639.8	5.0	7233.8	$(1^-$ to $4^+)$		
		4028	3.2	6852	$(1,2^+)$		
		4520.0	2.4	6353.5	1^-		
		4534.9	3.9	6338.6	$1^-,2^-,3^-$		
		5278.8	5.2	5594.6	2^+		
		5716.0	3.0	5157.3	2^+		
		5789.7	6.3	5083.6	$(2)^-$		
		6307.7[@]	<1.5	4565.5	2^+		
		6393.2[@]	<1.3	4479.98	4^-		
		6936.6	6.3	3936.5	2^+		
		7062.9[@]	<0.2	3810.18	3^-		
		7496.1[@]	<0.2	3376.9	0^+		
		8705.3	100	2167.472	2^+		
		10872.1[@]	<0.4	0.0	0^+		
10890	$(5^-$ to $8^-)$	2765	59 *10*	8125.0	(6^-)		
		3382	100 *10*	7508.12	7^-		
10914.5	$(1^-,2,3^-)$	x					I_γ: 10% γ absolute branching is unobserved in (p,γ):resonances. Additional information 70.
		3680.5	26	7233.8	$(1^-$ to $4^+)$		
		3813.5	22	7100.8	$(1^-$ to $4^+)$		
		4010.5	10	6903.8	$2^-,3^-$		
		4044.4	9	6869.9	$(2^-,3,4^+)$		
		4090.3	20	6824.0	$(2^+,3^-)$		
		4292.6	13	6621.6	$(1^-,2,3^-)$		
		4428.8	46	6485.4	$(1^-,2,3^-)$		
		4560.7	28	6353.5	1^-		
		5056.6	19	5857.5	$(2)^-$		
		5089.2	1.9	5824.9	3^-		
		5319.5	44	5594.6	2^+		
		5400.8	38	5513.3	3^-		
		5830.4	28	5083.6	$(2)^-$		
		6037.0	31	4877.0	3^-		
		6348.4	34	4565.5	2^+		
		6977.3	12	3936.5	2^+		

From ENSDF

$^{38}_{18}Ar_{20}$-46

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
10914.5	(1⁻,2,3⁻)	7103.6	81	3810.18	3⁻		
		8745.9	100	2167.472	2⁺		
10933	1⁻	8764	47	2167.472	2⁺		I_γ: from (α,γ):resonances.
		10931	100	0.0	0⁺	(E1)	I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
10945.0	(1⁻,2⁺)	x					I_γ: 21% γ absolute branching is unobserved in (p,γ):resonances. Additional information 71.
		3262	2.5	7683	(3⁻,4⁺)		
		4041.0	14.0	6903.8	2⁻,3⁻		
		4370.4	6.0	6574.3	1⁻		
		4448.9	7.5	6495.8	(2⁻,3⁻)		
		4591.2	11.1	6353.5	1⁻		
		4606.1	22	6338.6	1⁻,2⁻,3⁻		
		4694.8	8.5	6249.9	2⁺		
		5210.7	15.1	5733.9	1⁻		
		5350.0	13.1	5594.6	2⁺		
		5392.4	4.5	5552.21	1⁺,2⁺		
		5431.3	8.5	5513.3	3⁻		
		5787.2	13.6	5157.3	2⁺		
		6067.5	91	4877.0	3⁻		
		6378.9	39	4565.5	2⁺		
		7007.8	7.1	3936.5	2⁺		
		7134.1	20	3810.18	3⁻		
		7567.3[@]	<2	3376.9	0⁺		
		8776.4	100	2167.472	2⁺		
		10943.3	13.6	0.0	0⁺		
10947.4	(2⁻,3,4⁺)	x					I_γ: 23% γ absolute branching is unobserved in (p,γ):resonances. Additional information 72.
		3264	5	7683	(3⁻,4⁺)		
		4077.3	7	6869.9	(2⁻,3,4⁺)		
		4123.2	5	6824.0	(2⁺,3⁻)		
		4737.7	5	6209.4	4⁻		
		5089.5	5	5857.5	(2)⁻		
		5433.7	21	5513.3	3⁻		
		5863.3	11	5083.6	(2)⁻		
		6381.3	64	4565.5	2⁺		
		6466.8	18	4479.98	4⁻		
		7010.2[@]	<2.5	3936.5	2⁺		
		7136.5	32	3810.18	3⁻		
		7569.7[@]	<1.4	3376.9	0⁺		
		8778.8	100	2167.472	2⁺		

From ENSDF

$^{38}_{18}Ar_{20}$-47

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	Comments
10947.4	$(2^-,3,4^+)$	10945.7[@]	<0.7	0.0	0^+		
10947.5	(9^-)	773 *1*	28 *10*	10174.29	9^-		E_γ,I_γ: from (^{28}Si,α2pγ).
		1598 *2*	10 *4*	9349.6	(7^-)		E_γ,I_γ: from (^{28}Si,α2pγ).
		2378 *1*	100 *7*	8569.59	8^+	D	E_γ,I_γ,Mult.: from (^{28}Si,α2pγ).
		3439 *2*	10 *4*	7508.12	7^-		E_γ,I_γ: from (^{28}Si,α2pγ).
		3877.1[@]	43 *7*	7070.19	$(6)^-$		E_γ,I_γ: γ from (α,pγ) only, treated as questionable by the evaluator since it involves mult=M3, which is unlikely. In addition a γ ray with the branching ratio reported in (α,pγ) should have been seen in (^{28}Si,α2pγ).
10963.3	$2^{(+)}$	x					I_γ: 32% γ absolute branching is unobserved in (p,γ):resonances. Additional information 73.
		3069.8	4.7	7893.4	$(1^+,2^+)$		
		3280	5.3	7683	$(3^-,4^+)$		
		3532.1	11.3	7431.0	$(2^-,3,4^+)$		
		3593	7.2	7370	(1^+)		
		3629	13.4	7334	$(1^-$ to $4^+)$		
		3729.3	5.3	7233.8	$(1^-$ to $4^+)$		
		4015.2	25	6947.9	(2^+)		
		4059.3	26	6903.8	$2^-,3^-$		
		4139.1	100	6824.0	$(2^+,3^-)$		
		4190.4	1.9	6772.7	1^-		
		4388.7	26	6574.3	1^-		
		4609.5	73	6353.5	1^-		
		4713.1	13.4	6249.9	2^+		
		4749.2	6.6	6213.8	(2^+)		
		5105.4	10.7	5857.5	$(2)^-$		
		5138.0	3.4	5824.9	3^-		
		5229.0	13.4	5733.9	1^-		
		5449.6	11.9	5513.3	3^-		
		5613.5	1.9	5349.4	4^+		
		5805.5	40	5157.3	2^+		
		6085.8	33	4877.0	3^-		
		6397.2	33	4565.5	2^+		
		7585.6	6.6	3376.9	0^+		
		8794.7	2.7	2167.472	2^+		
10988.2	(2)	x					I_γ: 15% γ absolute branching is unobserved in (p,γ):resonances. Additional information 74.
		4040.1	2.7	6947.9	(2^+)		
		4084.2	4.6	6903.8	$2^-,3^-$		
		4118.1	9.1	6869.9	$(2^-,3,4^+)$		
		4649.3	4.1	6338.6	$1^-,2^-,3^-$		
		4778.5	1.1	6209.4	4^-		

From ENSDF

$^{38}_{18}Ar_{20}$-48

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.#	δ#	Comments
10988.2	(2)	5130.3	6.8	5857.5	$(2)^-$			
		5162.9	4.6	5824.9	3^-			
		5435.6	4.6	5552.21	$1^+,2^+$			
		5474.5	2.3	5513.3	3^-			
		5830.4	2.3	5157.3	2^+			
		5904.1	2.3	5083.6	$(2)^-$			
		6110.7	2.3	4877.0	3^-			
		6422.1	23	4565.5	2^+			
		6507.6	2.3	4479.98	4^-			
		7051.0	9.1	3936.5	2^+			
		7177.3	11.4	3810.18	3^-			
		7610.5	100	3376.9	0^+			
		10986.5	3.0	0.0	0^+			
11013	1	5188	<15	5824.9	3^-			I_γ: from (α,γ):resonances.
		7635	23	3376.9	0^+			I_γ: from (α,γ):resonances.
		8844	29	2167.472	2^+			I_γ: from (α,γ):resonances.
		11011	100	0.0	0^+	D		I_γ: from (α,γ):resonances. Mult.: from γ(θ) in (α,γ):resonances.
11032	1^-	7095@	<12	3936.5	2^+			I_γ: from (α,γ):resonances.
		8863	22	2167.472	2^+	(E1+M2)	−0.3 *2*	I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances; polarity from level scheme.
		11030	100	0.0	0^+	(E1)		I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances; polarity from level scheme.
11045.2	(3^-)	6479.1	25	4565.5	2^+			I_γ: from (α,γ):resonances.
		8876.6	100	2167.472	2^+	D+Q	+0.07 *3*	I_γ: from (α,γ):resonances. Mult.,δ: from γ(θ) in (α,γ):resonances.
11053.7	(2)	x						I_γ: 39% γ absolute branching is unobserved in (p,γ):resonances. Additional information 75.
		3371	5.5	7683	$(3^-,4^+)$			
		3720	6.4	7334	$(1^-$ to $4^+)$			
		3763.9	17	7289.6	$(3^-,4^+)$			
		3819.7	24	7233.8	$(1^-$ to $4^+)$			
		4431.8	53	6621.6	$(1^-,2,3^-)$			
		4714.8	31	6338.6	$1^-,2^-,3^-$			
		4844.0	11.8	6209.4	4^-			
		5011.5	100	6041.8	$(3^-,4^+)$			
		5195.8	27	5857.5	$(2)^-$			
		5458.7	11.8	5594.6	2^+			
		5540.0	31	5513.3	3^-			
		5895.9	50	5157.3	2^+			
		6487.6	20	4565.5	2^+			

From ENSDF

$^{38}_{18}Ar_{20}$-49

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11053.7	(2)	6573.1@	<8	4479.98	4^-	
		7116.5@	<8	3936.5	2^+	
		7242.8	37	3810.18	3^-	
		7676.0@	<5	3376.9	0^+	
		8885.1	100	2167.472	2^+	
		11052.0	30	0.0	0^+	
11059.2	$(1,2^+)$	x				I_γ: 17% γ absolute branching is unobserved in (p,γ):resonances. Additional information 76.
		4111.1	2.6	6947.9	(2^+)	
		4484.6	6.0	6574.3	1^-	
		5324.9	5.3	5733.9	1^-	
		5506.6	2.1	5552.21	$1^+,2^+$	
		5975.1	2.8	5083.6	$(2)^-$	
		6349.3	3.8	4709.3	0^+	
		6493.1	4.7	4565.5	2^+	
		7122.0@	<1.7	3936.5	2^+	
		7248.3@	<1.3	3810.18	3^-	
		7681.5	2.8	3376.9	0^+	
		8890.6	26	2167.472	2^+	
		11057.5	100	0.0	0^+	
11066.1	(2)	x				I_γ: 10% γ absolute branching is unobserved in (p,γ):resonances. Additional information 77.
		3696	11.1	7370	(1^+)	
		3830	7.4	7236	(2^+)	
		3965.1	3.3	7100.8	$(1^-$ to $4^+)$	
		4118.0	2.6	6947.9	(2^+)	
		4241.8	41	6824.0	$(2^+,3^-)$	
		4570.0	18.5	6495.8	$(2^-,3^-)$	
		4580.4	7.4	6485.4	$(1^-,2,3^-)$	
		4815.9	3.3	6249.9	2^+	
		4852.0	3.7	6213.8	(2^+)	
		5208.2	4.1	5857.5	$(2)^-$	
		5240.8	7.4	5824.9	3^-	
		5331.8	4.8	5733.9	1^-	
		5471.1	26	5594.6	2^+	
		5513.5	4.8	5552.21	$1^+,2^+$	
		5552.4	3.7	5513.3	3^-	
		6188.6	18.5	4877.0	3^-	
		6356.2	3.7	4709.3	0^+	
		6500.0	11.1	4565.5	2^+	

From ENSDF

$^{38}_{18}Ar_{20}$-50

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11066.1	(2)	6585.5	4.8	4479.98	4^-			
		7128.9	52	3936.5	2^+			
		7255.2	7.4	3810.18	3^-			
		8897.5	100	2167.472	2^+			
		11064.4	3.7	0.0	0^+			
11067	1^-	6501	18	4565.5	2^+			I_γ: from (α,γ):resonances.
		7130[@]	<18	3936.5	2^+			I_γ: from (α,γ):resonances.
		8898	61	2167.472	2^+	(E1(+M2))	0.0 *2*	I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
		11065	100	0.0	0^+	(E1)		Mult.: D from γ(θ) in (α,γ):resonances.
11068		2943		8125.0	(6^-)			
11078		1434	100	9644	$(5^-$ to $9^-)$			
11087	$(4^+$ to $8^+)$	3798	100	7288.32	6^+			
11096.9	(2^+)	x						I_γ: 28% γ absolute branching is unobserved. Additional information 78.
		3203.4	4.7	7893.4	$(1^+,2^+)$			
		3763	18.7	7334	$(1^-$ to $4^+)$			
		3807.1	6.0	7289.6	$(3^-,4^+)$			
		3995.9	5.3	7100.8	$(1^-$ to $4^+)$			
		4192.9	4.0	6903.8	$2^-,3^-$			
		4226.7	8.0	6869.9	$(2^-,3,4^+)$			
		4272.6	6.7	6824.0	$(2^+,3^-)$			
		4522.3	32	6574.3	1^-			
		4611.2	3.9	6485.4	$(1^-,2,3^-)$			
		4743.1	25	6353.5	1^-			
		4758.0	33	6338.6	$1^-,2^-,3^-$			
		4846.7	6.0	6249.9	2^+			
		4882.8	13.3	6213.8	(2^+)			
		5239.0	87	5857.5	$(2)^-$			
		5271.6	5.4	5824.9	3^-			
		5362.6	15.4	5733.9	1^-			
		5501.9	27	5594.6	2^+			
		5544.3	3.3	5552.21	$1^+,2^+$			
		5583.2	40	5513.3	3^-			
		5747.0	2.6	5349.4	4^+			
		5939.1	40	5157.3	2^+			
		6012.8	8.0	5083.6	$(2)^-$			
		6530.8	23	4565.5	2^+			
		7159.7	20	3936.5	2^+			
		7286.0	20	3810.18	3^-			
		7719.2	5.3	3376.9	0^+			

From ENSDF

$^{38}_{18}Ar_{20}$-51

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11096.9	(2$^+$)	8928.3	100	2167.472	2$^+$			
		11095.2	6.7	0.0	0$^+$			
11109	(4$^-$ to 8$^-$)	2984	100	8125.0	(6$^-$)			
11122.9	3$^-$	4637.2	13	6485.4	(1$^-$,2,3$^-$)			I_γ: from (α,γ):resonances.
		6642.3	14	4479.98	4$^-$			I_γ: from (α,γ):resonances.
		8954.3	100	2167.472	2$^+$	D+Q	+0.11 *4*	I_γ: from (α,γ):resonances. Mult.,δ: D+Q from γ(θ) in (α,γ):resonances.
11146.9	(2,3$^-$)	x						I_γ: 31% γ absolute branching is unobserved. Additional information 79.
		4661.2	10.4	6485.4	(1$^-$,2,3$^-$)			
		4793.1	6.9	6353.5	1$^-$			
		4808.0	6.9	6338.6	1$^-$,2$^-$,3$^-$			
		4896.7	10.4	6249.9	2$^+$			
		4932.8	17	6213.8	(2$^+$)			
		5321.6	6.9	5824.9	3$^-$			
		5551.9	13.8	5594.6	2$^+$			
		5594.2	3.5	5552.21	1$^+$,2$^+$			
		5633.2	3.5	5513.3	3$^-$			
		5797.0	3.5	5349.4	4$^+$			
		6580.8	6.9	4565.5	2$^+$			
		6666.3	6.9	4479.98	4$^-$			
		7209.7	6.9	3936.5	2$^+$			
		7336.0	10.4	3810.18	3$^-$			
		8978.3	100	2167.472	2$^+$			
		11145.1	24	0.0	0$^+$			
11161.0	(2$^-$,3,4$^+$)	x						I_γ: 11% γ absolute branching is unobserved. Additional information 80.
		4559.1	7.8	6601.59	4$^-$			
		4675.3	15.0	6485.4	(1$^-$,2,3$^-$)			
		4684.1	9.4	6476.6	(0$^+$ to 3$^-$)			
		4951.3	7.2	6209.4	4$^-$			
		5335.7	9.4	5824.9	3$^-$			
		5608.3	5.0	5552.21	1$^+$,2$^+$			
		5647.2	5.9	5513.3	3$^-$			
		6076.9	28	5083.6	(2)$^-$			
		7223.8	100	3936.5	2$^+$			
		7350.1	6.3	3810.18	3$^-$			
		8992.4	81	2167.472	2$^+$			
11163	(6,7,8)	2672	58	8491.1	(6$^-$)			I_γ: from (α,pγ).
		3039	100	8124	(3$^-$ to 6$^+$)			I_γ: from (α,pγ).
		3086	76	8077.20	7$^+$			I_γ: from (α,pγ).
		3655	70	7508.12	7$^-$			

From ENSDF

$^{38}_{18}Ar_{20}$-52

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Comments
11167.6	(3⁻)	4297.4	2.3	6869.9	(2⁻,3,4⁺)	
		4394.6	0.6	6772.7	1⁻	
		4593.0	1.1	6574.3	1⁻	
		4828.7	0.12	6338.6	1⁻,2⁻,3⁻	
		4917.4	0.6	6249.9	2⁺	
		4957.9	0.6	6209.4	4⁻	
		5309.7	1.2	5857.5	(2)⁻	
		5342.3	0.5	5824.9	3⁻	
		5433.3	0.36	5733.9	1⁻	
		5572.6	2.0	5594.6	2⁺	
		5653.8	2.5	5513.3	3⁻	
		6083.5	0.6	5083.6	(2)⁻	
		6290.0	3.3	4877.0	3⁻	
		6601.5[@]	<0.1	4565.5	2⁺	
		6687.0[@]	<0.1	4479.98	4⁻	
		7230.4	2.6	3936.5	2⁺	
		7356.7[@]	<0.4	3810.18	3⁻	
		7789.8[@]	<0.4	3376.9	0⁺	
		8999.0	100	2167.472	2⁺	
		11165.8	0.7	0.0	0⁺	
11173.0	3⁻	x				I_γ: 18% γ absolute branching is unobserved. Additional information 81.
		3490	4.6	7683	(3⁻,4⁺)	
		3721	4.2	7452	(1⁻ to 4⁺)	
		3741.8	16.7	7431.0	(2⁻,3,4⁺)	
		3883.2	8.3	7289.6	(3⁻,4⁺)	
		3980.6	12.5	7192.2	(2⁻,3,4)	
		4072.0	12.5	7100.8	(1⁻ to 4⁺)	
		4127	5.4	7046	(3⁻,4⁺)	
		4348.6	16.7	6824.0	(2⁺,3⁻)	
		4551.1	8.3	6621.6	(1⁻,2,3⁻)	
		4571.1	1.7	6601.59	4⁻	
		4676.9	38	6495.8	(2⁻,3⁻)	
		4958.9	4.6	6213.8	(2⁺)	
		4963.3	4.2	6209.4	4⁻	
		5119.4	4.2	6053.2	(4⁺)	
		5130.8	8.3	6041.8	(3⁻,4⁺)	
		5578.0	12.5	5594.6	2⁺	
		6015.2	8.3	5157.3	2⁺	
		6295.4	46	4877.0	3⁻	
		6606.9	3.3	4565.5	2⁺	

From ENSDF

$^{38}_{18}Ar_{20}$-53

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11173.0	3⁻	6692.4	4.2	4479.98	4⁻			
		7235.8	8.3	3936.5	2⁺			
		7362.1	8.3	3810.18	3⁻			
		7795.2	1.3	3376.9	0⁺			
		9004.4	100	2167.472	2⁺			
11174	(5⁻ to 9⁻)	2201	100	8972.85	7⁻			
11175	1⁻	6017[@]	<24	5157.3	2⁺			I_γ: from (α,γ):resonances.
		7238	45	3936.5	2⁺			I_γ: from (α,γ):resonances.
		9006	100	2167.472	2⁺	(E1(+M2))	0.00 *3*	I_γ: from (α,γ):resonances. Mult.: D(+Q) from γ(θ) in (α,γ):resonances.
		11173	93	0.0	0⁺	(E1)		I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
11184.8	(2⁺,3⁻)	4236.6	1.5	6947.9	(2⁺)			
		4314.6	3.0	6869.9	(2⁻,3,4⁺)			
		4562.9	1.1	6621.6	(1⁻,2,3⁻)			
		4610.2	1.8	6574.3	1⁻			
		5632.1	3.0	5552.21	1⁺,2⁺			
		5671.0	12.1	5513.3	3⁻			
		6027.0	6.1	5157.3	2⁺			
		6100.7	1.5	5083.6	(2)⁻			
		6307.2	3.0	4877.0	3⁻			
		7247.6	7.6	3936.5	2⁺			
		7373.9	3.0	3810.18	3⁻			
		9016.2	100	2167.472	2⁺			
		11183.0	0.76	0.0	0⁺			
11197.6	(1⁻,2,3⁻)	x						I_γ: 18% γ absolute branching is unobserved. Additional information 82.
		3205	14.3	7992	(1⁻,2,3⁻)			
		3963.6	6.2	7233.8	(1⁻ to 4⁺)			
		4373.3	38	6824.0	(2⁺,3⁻)			
		4424.6	4.8	6772.7	1⁻			
		4843.8	19	6353.5	1⁻			
		4858.7	9.5	6338.6	1⁻,2⁻,3⁻			
		4947.4	14.3	6249.9	2⁺			
		5339.7	33	5857.5	(2)⁻			
		5372.3	19	5824.9	3⁻			
		5463.3	19	5733.9	1⁻			
		5602.6	14.3	5594.6	2⁺			
		5683.8	14.3	5513.3	3⁻			
		6039.8	19	5157.3	2⁺			
		6113.5	16	5083.6	(2)⁻			
		6320.0	0.95	4877.0	3⁻			

From ENSDF

$^{38}_{18}Ar_{20}$-54

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11197.6	(1⁻,2,3⁻)	6631.5	19	4565.5	2⁺	
		7260.4	19	3936.5	2⁺	
		7386.6	14	3810.18	3⁻	
		9029.0	100	2167.472	2⁺	
11199	(8,9,10⁺)	2629	100	8569.59	8⁺	
11201.9	1⁻	3210	1.3	7992	(1⁻,2,3⁻)	
		3308.3	0.9	7893.4	(1⁺,2⁺)	
		3967.9	0.9	7233.8	(1⁻ to 4⁺)	
		4377.6	5.4	6824.0	(2⁺,3⁻)	
		4428.9	1.3	6772.7	1⁻	
		4520.0	2.7	6681.6	(0,1,2)	
		4627.3	1.4	6574.3	1⁻	
		4725.0	10.7	6476.6	(0⁺ to 3⁻)	
		4848.1	1.6	6353.5	1⁻	
		4951.7	1.3	6249.9	2⁺	
		5344.0	3.8	5857.5	(2)⁻	
		5467.6	2.0	5733.9	1⁻	
		5606.9	3.2	5594.6	2⁺	
		6044.1	1.8	5157.3	2⁺	
		6117.8	5.9	5083.6	(2)⁻	
		6635.8	7.1	4565.5	2⁺	
		7264.7	20	3936.5	2⁺	
		7390.9	1.1	3810.18	3⁻	
		7824.1	1.6	3376.9	0⁺	
		9033.3	8.9	2167.472	2⁺	
		11200.1	100	0.0	0⁺	
11210.4	(1⁻,2,3⁻)	x				I_γ: 11% γ absolute branching is unobserved. Additional information 83.
		3316.8	1.4	7893.4	(1⁺,2⁺)	
		3920.6	1.6	7289.6	(3⁻,4⁺)	
		3976.4	1.1	7233.8	(1⁻ to 4⁺)	
		4262.2	2.8	6947.9	(2⁺)	
		4386.1	0.7	6824.0	(2⁺,3⁻)	
		4437.4	0.85	6772.7	1⁻	
		4635.8	1.3	6574.3	1⁻	
		4996.2	1.3	6213.8	(2⁺)	
		5352.5	1.3	5857.5	(2)⁻	
		5385.1	0.4	5824.9	3⁻	
		5476.1	1.6	5733.9	1⁻	
		5657.7	4.2	5552.21	1⁺,2⁺	
		5696.6	0.7	5513.3	3⁻	
		6644.3	2.8	4565.5	2⁺	

From ENSDF

$^{38}_{18}Ar_{20}$-55

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11210.4	(1⁻,2,3⁻)	7273.2	3.7	3936.5	2⁺	
		9041.8	100	2167.472	2⁺	
11214.7	(1⁻,2⁺)	x				I_γ: 16% γ absolute branching is unobserved. Additional information 84.
		6056.9	9.1	5157.3	2⁺	
		6504.8	11.4	4709.3	0⁺	
		6648.6	43	4565.5	2⁺	
		7277.5	5.2	3936.5	2⁺	
		9046.1	23	2167.472	2⁺	
		11212.9	100	0.0	0⁺	
11227.3	(2⁺)	x				I_γ: 22% γ absolute branching is unobserved. Additional information 85.
		3235	7.0	7992	(1⁻,2,3⁻)	
		3775	4.0	7452	(1⁻ to 4⁺)	
		3796.1	3.0	7431.0	(2⁻,3,4⁺)	
		3937.5	7.0	7289.6	(3⁻,4⁺)	
		3993.3	10.0	7233.8	(1⁻ to 4⁺)	
		4279.1	4.5	6947.9	(2⁺)	
		4403.0	10.0	6824.0	(2⁺,3⁻)	
		4605.4	25	6621.6	(1⁻,2,3⁻)	
		4731.2	10.0	6495.8	(2⁻,3⁻)	
		4741.6	3.0	6485.4	(1⁻,2,3⁻)	
		4888.4	10.0	6338.6	1⁻,2⁻,3⁻	
		4977.0	3.0	6249.9	2⁺	
		5013.1	35	6213.8	(2⁺)	
		5369.4	10.0	5857.5	(2)⁻	
		5402.0	2.0	5824.9	3⁻	
		5493.0	2.5	5733.9	1⁻	
		5674.6	15.0	5552.21	1⁺,2⁺	
		5877.4	1.0	5349.4	4⁺	
		6069.5	20	5157.3	2⁺	
		6143.2	5.0	5083.6	(2)⁻	
		6349.7	10.0	4877.0	3⁻	
		6661.2	35	4565.5	2⁺	
		7290.0	5.0	3936.5	2⁺	
		7416.3	50	3810.18	3⁻	
		9058.7	100	2167.472	2⁺	
		11225.5	5.0	0.0	0⁺	
11233.6	(2⁺,3⁻)	x				I_γ: 28% γ absolute branching is unobserved. Additional information 86.
		4659.0	6.7	6574.3	1⁻	
		5258.4	11.1	5974.8	(0⁺ to 3⁻)	

From ENSDF

$^{38}_{18}Ar_{20}$-56

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	Comments
11233.6	(2$^+$,3$^-$)	5574.6	6.7	5658.61	5$^-$		
		6075.8	4.4	5157.3	2$^+$		
		6149.5	4.4	5083.6	(2)$^-$		
		6667.5	6.7	4565.5	2$^+$		
		9065.0	20	2167.472	2$^+$		
		11231.8	100	0.0	0$^+$		
11244.8	(3$^+$)	x					I_γ: 19% γ absolute branching is unobserved. Additional information 87.
		3875	40	7370	(1$^+$)		
		4010.8	8.0	7233.8	(1$^-$ to 4$^+$)		
		4143.8	33	7100.8	(1$^-$ to 4$^+$)		
		4199	60	7046	(3$^-$,4$^+$)		
		4420.5	60	6824.0	(2$^+$,3$^-$)		
		4759.1	30	6485.4	(1$^-$,2,3$^-$)		
		4905.9	16	6338.6	1$^-$,2$^-$,3$^-$		
		4968.4	30	6276.1	4$^+$		
		4994.5	30	6249.9	2$^+$		
		5030.6	65	6213.8	(2$^+$)		
		5035.0	90	6209.4	4$^-$		
		5191.2	30	6053.2	(4$^+$)		
		6367.2	60	4877.0	3$^-$		
		6764.2	80	4479.98	4$^-$		
		7307.5	20	3936.5	2$^+$		
		7433.8	60	3810.18	3$^-$		
		9076.2	100	2167.472	2$^+$		
11250	1$^-$	7872	<10	3376.9	0$^+$		I_γ: from (α,γ):resonances.
		11248	100	0.0	0$^+$	(E1)	I_γ: from (α,γ):resonances. Mult.: D from γ(θ) in (α,γ):resonances.
11264.9	(2$^-$,3$^-$)	x					I_γ: 34% γ absolute branching is unobserved. Additional information 88.
		4316.7	18	6947.9	(2$^+$)		
		4491.9	100	6772.7	1$^-$		
		4690.3	41	6574.3	1$^-$		
		4911.1	65	6353.5	1$^-$		
		5014.6	11.8	6249.9	2$^+$		
		5439.6	11.8	5824.9	3$^-$		
		5530.6	53	5733.9	1$^-$		
		5751.1	24	5513.3	3$^-$		
		6387.3	41	4877.0	3$^-$		
		6784.3	5.9	4479.98	4$^-$		
		7453.9	18	3810.18	3$^-$		

From ENSDF

$^{38}_{18}Ar_{20}$-57

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.#	δ#	Comments
11268.1	3⁻	x						I_γ: 14% γ absolute branching is unobserved. Additional information 89.
		3978.3	3.2	7289.6	(3⁻,4⁺)			
		4222	3.2	7046	(3⁻,4⁺)			
		4646.2	16	6621.6	(1⁻,2,3⁻)			
		4693.5	3.2	6574.3	1⁻			
		4782.4	3.2	6485.4	(1⁻,2,3⁻)			
		4914.3	9.7	6353.5	1⁻			
		4929.2	3.2	6338.6	1⁻,2⁻,3⁻			
		5053.9	16	6213.8	(2⁺)			
		5533.8	3.2	5733.9	1⁻			
		5673.0	16	5594.6	2⁺			
		5715.4	26	5552.21	1⁺,2⁺			
		5754.3	6.5	5513.3	3⁻			
		6110.3	16	5157.3	2⁺			
		6184.0	6.5	5083.6	(2)⁻			
		6390.5	9.7	4877.0	3⁻			
		7330.8	35	3936.5	2⁺			
		9099.5	100	2167.472	2⁺	(E1(+M2))	−0.02 *3*	Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances.
11272.1	(3⁻)	x						I_γ: 45% γ absolute branching is unobserved. Additional information 90.
		3902	23	7370	(1⁺)			
		4776.0	15	6495.8	(2⁻,3⁻)			
		5062.3	46	6209.4	4⁻			
		5446.8	15	5824.9	3⁻			
		5677.0	38	5594.6	2⁺			
		5922.2	15	5349.4	4⁺			
		6394.5	15	4877.0	3⁻			
		6706.0	69	4565.5	2⁺			
		7334.8	100	3936.5	2⁺			
		7461.1	23	3810.18	3⁻			
		9103.5	62	2167.472	2⁺			
11275.7	(1,2⁺)	4174.7	2.0	7100.8	(1⁻ to 4⁺)			
		4593.8	2.0	6681.6	(0,1,2)			
		4653.8	2.0	6621.6	(1⁻,2,3⁻)			
		4790.0	8.2	6485.4	(1⁻,2,3⁻)			
		4921.9	4.1	6353.5	1⁻			
		4936.8	2.0	6338.6	1⁻,2⁻,3⁻			
		5061.5	4.1	6213.8	(2⁺)			
		5300.5	27	5974.8	(0⁺ to 3⁻)			
		5417.8	4.1	5857.5	(2)⁻			
		5541.4	2.0	5733.9	1⁻			

From ENSDF

$^{38}_{18}Ar_{20}$-58

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11275.7	(1,2$^+$)	5680.6	2.0	5594.6	2$^+$			
		5723.0	2.0	5552.21	1$^+$,2$^+$			
		6191.6	2.0	5083.6	(2)$^-$			
		6565.8	4.1	4709.3	0$^+$			
		6709.6	4.1	4565.5	2$^+$			
		7338.4	6.1	3936.5	2$^+$			
		7897.9	12.2	3376.9	0$^+$			
		9107.1	10.2	2167.472	2$^+$			
		11273.9	100	0.0	0$^+$			
11285.4	(2$^+$,3)	x						I_γ: 35% γ absolute branching is unobserved. Additional information 91.
		3915	3.6	7370	(1$^+$)			
		4461.1	5.4	6824.0	(2$^+$,3$^-$)			
		5427.5	5.4	5857.5	(2)$^-$			
		5935.5	1.8	5349.4	4$^+$			
		9116.8	100	2167.472	2$^+$			
11289.4	(3$^-$)	x						I_γ: 37% γ absolute branching is unobserved. Additional information 92.
		4385.3	3.6	6903.8	2$^-$,3$^-$			
		4465.1	10.7	6824.0	(2$^+$,3$^-$)			
		4714.8	10.7	6574.3	1$^-$			
		5775.6	21	5513.3	3$^-$			
		5939.5	3.6	5349.4	4$^+$			
		6205.3	7.1	5083.6	(2)$^-$			
		6411.8	10.7	4877.0	3$^-$			
		6808.8	10.7	4479.98	4$^-$			
		7352.1	43	3936.5	2$^+$			
		7478.4	3.6	3810.18	3$^-$			
		9120.8	100	2167.472	2$^+$			
11290	(7$^+$ to 11$^+$)	1356	100	9934.0	(9$^+$)			
11298.7	(10$^+$)	1364 *1*	56 *28*	9934.0	(9$^+$)	D+Q		E_γ,I_γ,Mult.: from (^{28}Si,α2pγ). Mult from γ(DCO).
		1959.5 *7*	100 *6*	9339.2	8$^+$	Q		E_γ,I_γ,Mult.: from (^{28}Si,α2pγ). Mult from γ(DCO).
11302.4	5$^-$	4256	1.2	7046	(3$^-$,4$^+$)			
		4627.7	8.1	6674.4	5$^-$			
		4700.5	5.9	6601.59	4$^-$			
		4893.7	1.4	6408.32	6$^+$			
		5092.6	4.9	6209.4	4$^-$			
		5643.3	46	5658.61	5$^-$	M1+E2	−0.19 *6*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		6715.9	100	4585.87	5$^-$	M1(+E2)	−0.03 *6*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		6736.3[@]	<0.2	4565.5	2$^+$			
		6821.8	2.2	4479.98	4$^-$			

From ENSDF

$^{38}_{18}Ar_{20}$-59

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11302.4	5⁻	7365.1[@]	<0.2	3936.5	2⁺			
		7491.4[@]	<0.2	3810.18	3⁻			
		7924.6[@]	<0.2	3376.9	0⁺			
		9133.7[@]	<0.2	2167.472	2⁺			
		11300.6[@]	<0.2	0.0	0⁺			
11307.5	5⁻	4632.8	7.4	6674.4	5⁻			
		4705.6	1.9	6601.59	4⁻			
		4898.8[@]	0.7	6408.32	6⁺			
		5097.7	1.9	6209.4	4⁻			
		5648.4	74	5658.61	5⁻	M1+E2	−0.13 *6*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		6721.0	100	4585.87	5⁻	M1(+E2)	−0.03 *6*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		6826.9	0.6	4479.98	4⁻			
		9138.8	1.1	2167.472	2⁺			
11315	1⁻	4829	28	6485.4	(1⁻,2,3⁻)			I_γ: from (α,γ):resonances.
		7378	32	3936.5	2⁺			I_γ: from (α,γ):resonances.
		7937	15	3376.9	0⁺			I_γ: from (α,γ):resonances.
		9146	38	2167.472	2⁺	(E1(+M2))	−0.2 *2*	I_γ: from (α,γ):resonances. Mult.: D(+Q) from γ(θ) in (α,γ):resonances.
		11313	100	0.0	0⁺	(E1)		I_γ: from (α,γ):resonances. Mult.: D(+Q) from γ(θ) in (α,γ):resonances.
11316.7	(3⁻)	x						I_γ: 26% γ absolute branching is unobserved. Additional information 93.
		3864	36	7452	(1⁻ to 4⁺)			
		4026.9	27	7289.6	(3⁻,4⁺)			
		4215.6	27	7100.8	(1⁻ to 4⁺)			
		4270	18	7046	(3⁻,4⁺)			
		4412.6	27	6903.8	2⁻,3⁻			
		4492.4	18	6824.0	(2⁺,3⁻)			
		4714.8	36	6601.59	4⁻			
		5066.4	36	6249.9	2⁺			
		5106.9	45	6209.4	4⁻			
		5263.1	9.1	6053.2	(4⁺)			
		5274.5	100	6041.8	(3⁻,4⁺)			
		5657.6	18	5658.61	5⁻			
		5721.6	36	5594.6	2⁺			
		5966.8	45	5349.4	4⁺			
		6158.9	64	5157.3	2⁺			
		6439.1	36	4877.0	3⁻			
		6730.2	36	4585.87	5⁻			
		6836.1	9.1	4479.98	4⁻			

From ENSDF

$^{38}_{18}Ar_{20}$-60

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11316.7	(3$^-$)	7379.4	18	3936.5	2$^+$	
		9148.0	27	2167.472	2$^+$	
11318.7	(2$^+$)	x				I_γ: 26% γ absolute branching is unobserved. Additional information 94.
		3866	3.1	7452	(1$^-$ to 4$^+$)	
		4084.7	2.4	7233.8	(1$^-$ to 4$^+$)	
		4370.5	2.1	6947.9	(2$^+$)	
		4494.4	6.9	6824.0	(2$^+$,3$^-$)	
		4822.6	4.5	6495.8	(2$^-$,3$^-$)	
		4833.0	10.3	6485.4	(1$^-$,2,3$^-$)	
		4979.7	7.9	6338.6	1$^-$,2$^-$,3$^-$	
		5104.5	5.5	6213.8	(2$^+$)	
		5460.8	13.1	5857.5	(2)$^-$	
		5493.4	3.8	5824.9	3$^-$	
		5584.4	2.8	5733.9	1$^-$	
		5723.6	28	5594.6	2$^+$	
		5968.8	1.7	5349.4	4$^+$	
		6160.9	10.0	5157.3	2$^+$	
		6234.6	3.5	5083.6	(2)$^-$	
		6441.1	1.4	4877.0	3$^-$	
		6608.8	24	4709.3	0$^+$	
		6838.1	2.1	4479.98	4$^-$	
		7381.4	14	3936.5	2$^+$	
		7507.7	3.5	3810.18	3$^-$	
		9150.0	100	2167.472	2$^+$	
		11316.9	10.3	0.0	0$^+$	
11328.3	(3$^-$,4$^+$)	x				I_γ: 37% γ absolute branching is unobserved. Additional information 95.
		5118.5	9.4	6209.4	4$^-$	
		5286.1	31	6041.8	(3$^-$,4$^+$)	
		5669.2	9.4	5658.61	5$^-$	
		5978.4	6.2	5349.4	4$^+$	
		6450.7	41	4877.0	3$^-$	
		7517.3	100	3810.18	3$^-$	
		9159.6	3.1	2167.472	2$^+$	
11330.5	(1$^-$ to 4$^+$)	x				I_γ: 24% γ absolute branching is unobserved. Additional information 96.
		4460.3	9.7	6869.9	(2$^-$,3,4$^+$)	
		6172.7	13	5157.3	2$^+$	
		6246.3	9.7	5083.6	(2)$^-$	
		6452.9	58	4877.0	3$^-$	
		6764.4	16	4565.5	2$^+$	

From ENSDF

$^{38}_{18}Ar_{20}$-61

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11330.5	(1⁻ to 4⁺)	7393.2	29	3936.5	2⁺			
		7519.5	9.7	3810.18	3⁻			
		9161.8	100	2167.472	2⁺			
11338.6	(2⁺)	4434.5	1.5	6903.8	2⁻,3⁻			
		4842.5	1.5	6495.8	(2⁻,3⁻)			
		4852.9	1.5	6485.4	(1⁻,2,3⁻)			
		5124.4	1.5	6213.8	(2⁺)			
		5480.7	1.5	5857.5	(2)⁻			
		5513.3	13	5824.9	3⁻			
		5785.9	0.9	5552.21	1⁺,2⁺			
		5824.8	2.9	5513.3	3⁻			
		6180.8	5.9	5157.3	2⁺			
		6254.4	7.4	5083.6	(2)⁻			
		6461.0	10.3	4877.0	3⁻			
		7401.3	1.5	3936.5	2⁺			
		9169.9	100	2167.472	2⁺			
		11336.8	0.4	0.0	0⁺			
11348.9	(2⁻,3,4⁺)	6471.3	23	4877.0	3⁻			
		6868.3	100	4479.98	4⁻			
		7411.6	7.3	3936.5	2⁺			
		9180.2	14.5	2167.472	2⁺			
11350.6	3⁻	3358	2.3	7992	(1⁻,2,3⁻)			
		3898	7.0	7452	(1⁻ to 4⁺)			
		4060.8	5.0	7289.6	(3⁻,4⁺)			
		4158.2	4.0	7192.2	(2⁻,3,4)			
		4249.5	8.7	7100.8	(1⁻ to 4⁺)			
		4304	4.7	7046	(3⁻,4⁺)			
		4446.5	11.3	6903.8	2⁻,3⁻			
		4748.7	7.7	6601.59	4⁻			
		4854.5	19	6495.8	(2⁻,3⁻)			
		5074.1[@]	10.0	6276.1	4⁺			
		5140.8	6.7	6209.4	4⁻			
		5297.0	3.7	6053.2	(4⁺)			
		5525.3	8.0	5824.9	3⁻			
		5836.8	5.7	5513.3	3⁻			
		6000.7	1.3	5349.4	4⁺			
		6266.4	14.3	5083.6	(2)⁻			
		6473.0	100	4877.0	3⁻	M1+E2	−0.16 *10*	Mult.,δ: from $\gamma(\theta$,pol) in (p,γ):resonances.
		6784.4	9.7	4565.5	2⁺			
		6870.0	5.7	4479.98	4⁻			
		7413.3	1.7	3936.5	2⁺			

From ENSDF

$^{38}_{18}Ar_{20}$-62

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11350.6	3⁻	7539.6	63	3810.18	3⁻	M1+E2	−0.20 *10*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		7972.8[@]	<0.3	3376.9	0⁺			
		9181.9	50	2167.472	2⁺	E1(+M2)	+0.04 *7*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		11348.8[@]	<0.3	0.0	0⁺			
11354.6	3⁻	4752.7	3.9	6601.59	4⁻			
		4868.9	44	6485.4	(1⁻,2,3⁻)			
		5840.8	19	5513.3	3⁻			
		6477.0	23	4877.0	3⁻			
		6788.4	14	4565.5	2⁺			
		7543.6	18	3810.18	3⁻			
		9185.9	100	2167.472	2⁺			
11367.4	3⁻	x						I_γ: 47% γ absolute branching is unobserved. Additional information 97.
		4133.4	20	7233.8	(1⁻ to 4⁺)			
		4765.5	20	6601.59	4⁻			
		5509.5	20	5857.5	(2)⁻			
		5542.1	13	5824.9	3⁻			
		5853.6	60	5513.3	3⁻			
		6489.8	67	4877.0	3⁻			
		7430.1	40	3936.5	2⁺			
		7556.4	13	3810.18	3⁻			
		9198.7	100	2167.472	2⁺			
11373.7	(1⁻,2,3⁻)	x						I_γ: 21% γ absolute branching is unobserved. Additional information 98.
		4003	10	7370	(1⁺)			
		4469.6	15	6903.8	2⁻,3⁻			
		4549.4	50	6824.0	(2⁺,3⁻)			
		4799.1	15	6574.3	1⁻			
		4888.0	15	6485.4	(1⁻,2,3⁻)			
		5123.4	15	6249.9	2⁺			
		5159.5	10	6213.8	(2⁺)			
		5515.8	10	5857.5	(2)⁻			
		5639.4	10	5733.9	1⁻			

From ENSDF

$^{38}_{18}Ar_{20}$-63

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11373.7	(1⁻,2,3⁻)	5778.6	15	5594.6	2⁺			
		6215.9	5	5157.3	2⁺			
		6289.5	5	5083.6	(2)⁻			
		6496.1	100	4877.0	3⁻			
		6807.5	5	4565.5	2⁺			
		7562.7	15	3810.18	3⁻			
		9205.0	100	2167.472	2⁺			
11374	1⁻	11372	100	0.0	0⁺	(E1)		Mult.: D from γ(θ) in (α,γ):resonances.
11379	(4⁺ to 8⁺)	4970	100	6408.32	6⁺			
11379.1	(2⁺)	x						I_γ: 31% γ absolute branching is unobserved. Additional information 99.
		4145.1	30	7233.8	(1⁻ to 4⁺)			
		4893.4	10	6485.4	(1⁻,2,3⁻)			
		5102.6	30	6276.1	4⁺			
		5128.8	10	6249.9	2⁺			
		5164.9	100	6213.8	(2⁺)			
		5336.9	70	6041.8	(3⁻,4⁺)			
		5521.2	20	5857.5	(2)⁻			
		5553.8	60	5824.9	3⁻			
		5784.0	20	5594.6	2⁺			
		5826.4	40	5552.21	1⁺,2⁺			
		5865.3	20	5513.3	3⁻			
		6029.2	10	5349.4	4⁺			
		6294.9	20	5083.6	(2)⁻			
		6812.9	40	4565.5	2⁺			
		6898.4	90	4479.98	4⁻			
		7441.8	60	3936.5	2⁺			
		8001.3	10	3376.9	0⁺			
		9210.4	50	2167.472	2⁺			
11393.0	3⁻	x						I_γ: 37% γ absolute branching is unobserved. Additional information 100.
		4103.2	2.7	7289.6	(3⁻,4⁺)			
		4791.1	5.4	6601.59	4⁻			
		5879.2	5.4	5513.3	3⁻			
		6235.2	2.7	5157.3	2⁺			
		6308.8	2.7	5083.6	(2)⁻			
		6515.4	38	4877.0	3⁻			
		6912.3	8.1	4479.98	4⁻			
		7582.0	5.4	3810.18	3⁻			
		9224.3	100	2167.472	2⁺			
11399.5	(3⁻)	9230.8	100	2167.472	2⁺	D+Q	+0.23 *15*	Mult.,δ: from γ(θ) in (α,γ):resonances.

From ENSDF

$^{38}_{18}Ar_{20}$-64

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Comments
11401.5	(1$^-$,2$^+$)	x				I_γ: 38% γ absolute branching is unobserved. Additional information 101.
		6243.6	18	5157.3	2$^+$	
		6691.6	21	4709.3	0$^+$	
		6835.3	100	4565.5	2$^+$	
		7464.2	18	3936.5	2$^+$	
		7590.5	18	3810.18	3$^-$	
		11399.7	36	0.0	0$^+$	
11409.3	(2)	x				I_γ: 7% γ absolute branching is unobserved. Additional information 102.
		4461.1	1.6	6947.9	(2$^+$)	
		4636.3	4.4	6772.7	1$^-$	
		4834.7	2.4	6574.3	1$^-$	
		4923.6	8.0	6485.4	(1$^-$,2,3$^-$)	
		5055.4	8.4	6353.5	1$^-$	
		5132.8	12	6276.1	4$^+$	
		5159.0	2.8	6249.9	2$^+$	
		5199.5	2.4	6209.4	4$^-$	
		5551.4	4.8	5857.5	(2)$^-$	
		5584.0	7.2	5824.9	3$^-$	
		5674.9	2.8	5733.9	1$^-$	
		5814.2	20	5594.6	2$^+$	
		5856.6	20	5552.21	1$^+$,2$^+$	
		5895.5	2.8	5513.3	3$^-$	
		6059.4	3.2	5349.4	4$^+$	
		6251.4	24	5157.3	2$^+$	
		6325.1	24	5083.6	(2)$^-$	
		6531.7	3.2	4877.0	3$^-$	
		6843.1	100	4565.5	2$^+$	
		7472.0	24	3936.5	2$^+$	
		7598.3	8.0	3810.18	3$^-$	
		9240.6	84	2167.472	2$^+$	
		11407.5	0.8	0.0	0$^+$	
11423.9	(3$^-$)	x				I_γ: 9% γ absolute branching is unobserved. Additional information 103.
		3992.7	4.3	7431.0	(2$^-$,3,4$^+$)	
		4189.9	3.0	7233.8	(1$^-$ to 4$^+$)	
		4599.6	12.8	6824.0	(2$^+$,3$^-$)	
		4802.0	2.1	6621.6	(1$^-$,2,3$^-$)	
		4849.3	2.1	6574.3	1$^-$	
		4927.8	6.4	6495.8	(2$^-$,3$^-$)	
		5070.0	2.1	6353.5	1$^-$	

From ENSDF

$^{38}_{18}Ar_{20}$-65

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.#	Comments
11423.9	(3^-)	5209.7	6.4	6213.8	(2^+)		
		5598.6	4.3	5824.9	3^-		
		5828.8	2.1	5594.6	2^+		
		5871.2	13	5552.21	$1^+,2^+$		
		5910.1	17	5513.3	3^-		
		6266.0	2.1	5157.3	2^+		
		6546.3	0.6	4877.0	3^-		
		6857.7	1.5	4565.5	2^+		
		6943.2	2.1	4479.98	4^-		
		7486.6	8.5	3936.5	2^+		
		7612.9	4.3	3810.18	3^-		
		9255.2	100	2167.472	2^+		
11428	$(4^+$ to $8^+)$	5019	100	6408.32	6^+		
11428.9	$(3,4^+)$	x					I_γ: 23% γ absolute branching is unobserved. Additional information 104.
		3746	17	7683	$(3^-,4^+)$		
		4139.1	11	7289.6	$(3^-,4^+)$		
		4194.9	5.6	7233.8	$(1^-$ to $4^+)$		
		4524.8	11	6903.8	$2^-,3^-$		
		4604.6	22	6824.0	$(2^+,3^-)$		
		5152.4	78	6276.1	4^+		
		5375.3	39	6053.2	(4^+)		
		5603.6	22	5824.9	3^-		
		5876.2	5.6	5552.21	$1^+,2^+$		
		5915.1	5.6	5513.3	3^-		
		6079.0	17	5349.4	4^+		
		6271.0	5.6	5157.3	2^+		
		6344.7	5.6	5083.6	$(2)^-$		
		6551.3	5.6	4877.0	3^-		
		6862.7	22	4565.5	2^+		
		6948.2	5.6	4479.98	4^-		
		7491.6	17	3936.5	2^+		
		7617.9	100	3810.18	3^-		
		9260.2	33	2167.472	2^+		
11431.9	1^-	x					I_γ: 56% γ absolute branching is unobserved in (p,γ):resonances. Additional information 105.
		6554.3	52	4877.0	3^-		I_γ: from (α,γ):resonances only.
		6865.7	33	4565.5	2^+		
		8054.1	11	3376.9	0^+		
		9263.2	19	2167.472	2^+		
		11430.1	100	0.0	0^+	(E1)	Mult.: D from γ(θ) in (α,γ):resonances.

From ENSDF

$^{38}_{18}Ar_{20}$-66

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.#	δ#	Comments
11435.9	(2$^+$,3$^-$)	x						I_γ: 22% γ absolute branching is unobserved. Additional information 106.
		3542.3	3.6	7893.4	(1$^+$,2$^+$)			
		3753	14	7683	(3$^-$,4$^+$)			
		3984	100	7452	(1$^-$ to 4$^+$)			
		4102	36	7334	(1$^-$ to 4$^+$)			
		4200	9.1	7236	(2$^+$)			
		4487.7	20	6947.9	(2$^+$)			
		4584	36	6852	(1,2$^+$)			
		4611.6	3.6	6824.0	(2$^+$,3$^-$)			
		4662.9	18	6772.7	1$^-$			
		4814.0	73	6621.6	(1$^-$,2,3$^-$)			
		4861.3	18	6574.3	1$^-$			
		4939.8	33	6495.8	(2$^-$,3$^-$)			
		5082.0	6.4	6353.5	1$^-$			
		5096.9	6.4	6338.6	1$^-$,2$^-$,3$^-$			
		5159.4	10.0	6276.1	4$^+$			
		5185.6	18	6249.9	2$^+$			
		5221.7	6.4	6213.8	(2$^+$)			
		5578.0	6.4	5857.5	(2)$^-$			
		5610.6	5.5	5824.9	3$^-$			
		5701.5	18	5733.9	1$^-$			
		5883.2	27	5552.21	1$^+$,2$^+$			
		5922.1	7.3	5513.3	3$^-$			
		6351.7	18	5083.6	(2)$^-$			
		6558.2 *3*	6	4877.0	3$^-$			
		6726.0	2.7	4709.3	0$^+$			
		6849.4	15	4585.87	5$^-$			
		6869.7	3.6	4565.5	2$^+$			
		7498.6	18	3936.5	2$^+$			
		7624.9	82	3810.18	3$^-$			
		9267.2	45	2167.472	2$^+$			
		11434.1	7.3	0.0	0$^+$			
11442.9	3$^-$	4841.0	33	6601.59	4$^-$			I_γ: from (α,γ):resonances.
		6962.2	10	4479.98	4$^-$			I_γ: from (α,γ):resonances.
		9274.2	100	2167.472	2$^+$	(E1(+M2))	+0.02 *3*	I_γ: from (α,γ):resonances. Mult.,δ: D(+Q) from γ(θ) in (α,γ):resonances.
11443.6	(2$^-$,3)	x						I_γ: 21% γ absolute branching is unobserved. Additional information 107.
		4109	39	7334	(1$^-$ to 4$^+$)			
		4153.8	12	7289.6	(3$^-$,4$^+$)			
		4841.7	9.4	6601.59	4$^-$			

From ENSDF

$^{38}_{18}Ar_{20}$-67

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11443.6	(2⁻,3)	4957.9	10.0	6485.4	(1⁻,2,3⁻)	
		5229.4	7.8	6213.8	(2⁺)	
		5390.0	8.9	6053.2	(4⁺)	
		5401.4	14	6041.8	(3⁻,4⁺)	
		5848.5	28	5594.6	2⁺	
		6566.0	56	4877.0	3⁻	
		6877.4	61	4565.5	2⁺	
		7506.3	56	3936.5	2⁺	
		7632.6	39	3810.18	3⁻	
		9274.9	100	2167.472	2⁺	
11452		2253	100	9199	(4⁻ to 8⁻)	
11461.3	(1⁻,2⁺)	x				I_γ: 38% γ absolute branching is unobserved. Additional information 108.
		3567.7	63	7893.4	(1⁺,2⁺)	
		4227.2	88	7233.8	(1⁻ to 4⁺)	
		4360.2	25	7100.8	(1⁻ to 4⁺)	
		4779.4	100	6681.6	(0,1,2)	
		5603.4	75	5857.5	(2)⁻	
		5726.9	63	5733.9	1⁻	
		5866.2	25	5594.6	2⁺	
		5908.6	50	5552.21	1⁺,2⁺	
		6303.4	100	5157.3	2⁺	
		6895.1	38	4565.5	2⁺	
		7650.3	38	3810.18	3⁻	
		8083.5	25	3376.9	0⁺	
		9292.6	25	2167.472	2⁺	
		11459.4	63	0.0	0⁺	
11471.2	(1⁻,2⁺)	3577.6	4.2	7893.4	(1⁺,2⁺)	
		4646.9	2.8	6824.0	(2⁺,3⁻)	
		4849.3	2.8	6621.6	(1⁻,2,3⁻)	
		4896.6	5.6	6574.3	1⁻	
		5117.3	25	6353.5	1⁻	
		5132.2	2.5	6338.6	1⁻,2⁻,3⁻	
		5257.0	5.6	6213.8	(2⁺)	
		5613.3	11.1	5857.5	(2)⁻	
		5876.1	3.9	5594.6	2⁺	
		6387.0	8.3	5083.6	(2)⁻	
		6761.3	2.8	4709.3	0⁺	
		6905.0	100	4565.5	2⁺	
		7533.9	5.6	3936.5	2⁺	
		7660.2	5.6	3810.18	3⁻	
		8093.4	17	3376.9	0⁺	

From ENSDF

$^{38}_{18}Ar_{20}$-68

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
11471.2	$(1^-,2^+)$	9302.5	8.3	2167.472	2^+	
		11469.3	78	0.0	0^+	
11478.9	(3^-)	x				I_γ: 48% γ absolute branching is unobserved. Additional information 109.
		4109	29	7370	(1^+)	
		4654.6	71	6824.0	$(2^+,3^-)$	
		4877.0	57	6601.59	4^-	
		4982.7	14	6495.8	$(2^-,3^-)$	
		5202.4	14	6276.1	4^+	
		5264.7	57	6213.8	(2^+)	
		5269.1	29	6209.4	4^-	
		5425.3	29	6053.2	(4^+)	
		5436.7	86	6041.8	$(3^-,4^+)$	
		5621.0	14	5857.5	$(2)^-$	
		5653.5	14	5824.9	3^-	
		5819.8	14	5658.61	5^-	
		5883.8	100	5594.6	2^+	
		5965.1	14	5513.3	3^-	
		6321.0	71	5157.3	2^+	
		6394.7	14	5083.6	$(2)^-$	
		6601.3	29	4877.0	3^-	
		6912.7	14	4565.5	2^+	
		7541.6	14	3936.5	2^+	
		9310.2	57	2167.472	2^+	
11484	$(7^-$ to $11^-)$	1310	100	10174.29	9^-	
11495	$(5^+$ to $9^+)$	3418	100	8077.20	7^+	
11501.3	(2^+)	4070.1	4.6	7431.0	$(2^-,3,4^+)$	
		4655	3.6	6852	$(1,2^+)$	
		4677.0	9.1	6824.0	$(2^+,3^-)$	
		4819.4	27	6681.6	(0,1,2)	
		5291.5	0.9	6209.4	4^-	
		5526.1	2.7	5974.8	$(0^+$ to $3^-)$	
		5766.9	2.7	5733.9	1^-	
		6343.4	41	5157.3	2^+	
		6417.1	27	5083.6	$(2)^-$	
		6791.3	59	4709.3	0^+	
		6935.1	100	4565.5	2^+	
		7564.0	36	3936.5	2^+	
		8123.5	41	3376.9	0^+	
		11499.4	100	0.0	0^+	
11511.7	(2)	x				I_γ: 30% γ absolute branching is unobserved. Additional information 110.

From ENSDF

$^{38}_{18}Ar_{20}$-69

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11511.7	(2)	4146	8	7365		
		4177	8	7334	(1^- to 4^+)	
		4221.8	12	7289.6	(3^-,4^+)	
		4319.2	4	7192.2	(2^-,3,4)	
		5025.9	4	6485.4	(1^-,2,3^-)	
		5235.2	4	6276.1	4^+	
		5301.9	4	6209.4	4^-	
		5458.1	4	6053.2	(4^+)	
		5469.5	8	6041.8	(3^-,4^+)	
		5653.7	16	5857.5	$(2)^-$	
		5997.9	8	5513.3	3^-	
		6161.8	4	5349.4	4^+	
		6353.8	32	5157.3	2^+	
		6427.5	20	5083.6	$(2)^-$	
		6945.5	4	4565.5	2^+	
		7031.0	8	4479.98	4^-	
		7574.4	16	3936.5	2^+	
		7700.7	8	3810.18	3^-	
		9343.0	100	2167.472	2^+	
		11509.8	8	0.0	0^+	
11514.5	1^-	x				I_γ: 19% γ absolute branching is unobserved. Additional information 111.
		6356.6	3.3	5157.3	2^+	
		6430.3	3.3	5083.6	$(2)^-$	
		6948.3	4.9	4565.5	2^+	
		9345.8	21	2167.472	2^+	
		11512.6	100	0.0	0^+	
11519.7	(1^-,2^+,3^-)	x				I_γ: 50% γ absolute branching is unobserved. Additional information 112.
		4649.5	25	6869.9	(2^-,3,4^+)	
		4746.7	25	6772.7	1^-	
		4897.8	42	6621.6	(1^-,2,3^-)	
		5023.5	17	6495.8	(2^-,3^-)	
		5305.5	100	6213.8	(2^+)	
		6361.8	67	5157.3	2^+	
		6435.5	25	5083.6	$(2)^-$	
		6953.5	33	4565.5	2^+	
		7582.4	25	3936.5	2^+	
		7708.7	50	3810.18	3^-	
		9351.0	8.3	2167.472	2^+	
11527.6	(1,2^+)	x				I_γ: 66% γ absolute branching is unobserved. Additional information 113.

From ENSDF

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11527.6	(1,2$^+$)	5313.4	18	6213.8	(2$^+$)			
		5552.4	36	5974.8	(0$^+$ to 3$^-$)			
		6817.6	18	4709.3	0$^+$			
		7590.3	91	3936.5	2$^+$			
		8149.8	45	3376.9	0$^+$			
		9358.9	100	2167.472	2$^+$			
11530.2	(1$^-$,2$^+$)	x						I_γ: 19% γ absolute branching is unobserved. Additional information 114.
		6820.2	10.3	4709.3	0$^+$			
		7592.9	8.6	3936.5	2$^+$			
		8152.4	21	3376.9	0$^+$			
		11528.3	100	0.0	0$^+$			
11540.2	1$^-$	x						I_γ: 22% γ absolute branching is unobserved. Additional information 115.
		5186.3	5.1	6353.5	1$^-$			
		7602.9	26	3936.5	2$^+$			
		8162.4	5.1	3376.9	0$^+$			
		9371.5	64	2167.472	2$^+$			
		11538.3	100	0.0	0$^+$			
11543	(5$^+$ to 9$^+$)	3466	100	8077.20	7$^+$			
11545.3	(1$^-$,2)	x						I_γ: 42% γ absolute branching is unobserved. Additional information 116.
		5687.3	11	5857.5	(2)$^-$			
		5810.9	13	5733.9	1$^-$			
		6031.5	7.9	5513.3	3$^-$			
		9376.6	100	2167.472	2$^+$			
		11543.4	21	0.0	0$^+$			
11547	(7$^-$ to 11$^-$)	1373	100	10174.29	9$^-$			
11549.1	(10$^-$)	1374.7 *4*	100 *3*	10174.29	9$^-$	D+Q	+1.3 *8*	E_γ,I_γ: from (^{28}Si,α2pγ). Mult.,δ: from γ(DCO) in (^{28}Si,α2pγ), ΔJ=1. Original value of δ: +0.5<δ<+2.2.
		1524.4 *4*	41 *3*	10024.9	(8$^-$)	Q		E_γ,I_γ,Mult.: from (^{28}Si,α2pγ). Mult.: from γ(DCO) in (^{28}Si,α2pγ), ΔJ=2.
11552.6	(1)$^-$	x						I_γ: 21% γ absolute branching is unobserved. Additional information 117.
		4728.3	10.0	6824.0	(2$^+$,3$^-$)			
		4779.6	2.5	6772.7	1$^-$			
		4930.7	5.0	6621.6	(1$^-$,2,3$^-$)			
		5056.4	7.5	6495.8	(2$^-$,3$^-$)			
		5577.4	10.0	5974.8	(0$^+$ to 3$^-$)			
		5694.6	2.5	5857.5	(2)$^-$			

From ENSDF

$^{38}_{18}Ar_{20}$-71

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11552.6	$(1)^-$	5727.2	2.5	5824.9	3^-	
		5957.5	12.5	5594.6	2^+	
		6675.0	2.5	4877.0	3^-	
		6986.4	15	4565.5	2^+	
		7741.6	2.5	3810.18	3^-	
		8174.8	5.0	3376.9	0^+	
		9383.9	20	2167.472	2^+	
		11550.7	100	0.0	0^+	
11569.2	$(1^-,2,3^-)$	x				I_γ: 14% γ absolute branching is unobserved. Additional information 118.
		4335.1	1.1	7233.8	$(1^-$ to $4^+)$	
		4621.0	1.1	6947.9	(2^+)	
		4665.1	1.6	6903.8	$2^-,3^-$	
		4994.5	1.6	6574.3	1^-	
		5834.8	1.6	5733.9	1^-	
		5974.1	3.1	5594.6	2^+	
		6055.4	3.1	5513.3	3^-	
		6411.3	2.0	5157.3	2^+	
		6485.0	1.6	5083.6	$(2)^-$	
		6691.6	1.7	4877.0	3^-	
		7003.0	6.3	4565.5	2^+	
		7631.9	4.7	3936.5	2^+	
		7758.2	4.7	3810.18	3^-	
		9400.5	100	2167.472	2^+	
11595	$(4^+$ to $8^+)$	5186	100	6408.32	6^+	
11597.9	4^+	x				I_γ: 55% γ absolute branching is unobserved. Additional information 119.
		4693.8	12	6903.8	$2^-,3^-$	
		5555.7	41	6041.8	$(3^-,4^+)$	
		5772.5	24	5824.9	3^-	
		5938.8	47	5658.61	5^-	
		6720.3	100	4877.0	3^-	
		7117.2	35	4479.98	4^-	
		9429.2	5.9	2167.472	2^+	
11599.6	$(1,2^+)$	x				I_γ: 31% γ absolute branching is unobserved. Additional information 120.
		4651.4	8.8	6947.9	(2^+)	
		4747	5.9	6852	$(1,2^+)$	
		4775.3	5.9	6824.0	$(2^+,3^-)$	
		5349.3	8.8	6249.9	2^+	
		5741.6	5.9	5857.5	$(2)^-$	
		7033.4	53	4565.5	2^+	

From ENSDF

$^{38}_{18}Ar_{20}$-72

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
11599.6	(1,2$^+$)	7662.3	12	3936.5	2$^+$		
		9430.9	100	2167.472	2$^+$		
		11597.7	2.9	0.0	0$^+$		
11605.8	(1,2$^+$)	x					I_γ: 39% γ absolute branching is unobserved. Additional information 121.
		4832.8	16	6772.7	1$^-$		
		5630.6	58	5974.8	(0$^+$ to 3$^-$)		
		6447.9	74	5157.3	2$^+$		
		7039.6	47	4565.5	2$^+$		
		9437.1	100	2167.472	2$^+$		
		11603.9	26	0.0	0$^+$		
11608	(5$^+$ to 9$^+$)	3531	100	8077.20	7$^+$		
11614.7	11$^-$	1440.3 *2*	100	10174.29	9$^-$	E2	B(E2)(W.u.)=2.5 *+19−7* E_γ: weighted average of 1440.9 *4* from (^{28}Si,α2pγ), 1440.2 *2* from (^{16}O,2pγ), and 1440.31 *25* from (^{14}N,n2pγ). Mult.: from γ(θ,pol) in (^{16}O,2pγ), γ(DCO) in (^{28}Si,α2pγ), also supported by γ(θ) in (^{14}N,n2pγ).
11620	(7$^+$ to 11$^+$)	1686	100	9934.0	(9$^+$)		
11630		2431	100	9199	(4$^-$ to 8$^-$)		
11650.9	(9$^-$)	2301 *2*	100	9349.6	(7$^-$)	Q	Mult.: from γ(DCO) in (^{28}Si,α2pγ) for a doublet structure.
11652.1	(3,4$^+$)	x					I_γ: 40% γ absolute branching is unobserved. Additional information 122.
		4418.0	18	7233.8	(1$^-$ to 4$^+$)		
		4551.0	9.1	7100.8	(1$^-$ to 4$^+$)		
		4781.9	36	6869.9	(2$^-$,3,4$^+$)		
		5155.9	18	6495.8	(2$^-$,3$^-$)		
		5313.1	27	6338.6	1$^-$,2$^-$,3$^-$		
		5442.3	27	6209.4	4$^-$		
		5794.1	27	5857.5	(2)$^-$		
		6057.0	27	5594.6	2$^+$		
		6138.3	9.1	5513.3	3$^-$		
		6302.1	9.1	5349.4	4$^+$		
		6774.5	100	4877.0	3$^-$		
		7085.9	18	4565.5	2$^+$		
		7171.4	18	4479.98	4$^-$		
		7714.8	73	3936.5	2$^+$		
		7841.1	55	3810.18	3$^-$		
		9483.4	73	2167.472	2$^+$		
11672.3	(3)	x					I_γ: 11% γ absolute branching is unobserved. Additional information 123.
		3989	5.3	7683	(3$^-$,4$^+$)		

From ENSDF

$^{38}_{18}Ar_{20}$-73

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11672.3	(3)	4382.4	7.7	7289.6	$(3^-,4^+)$	
		4479.8	5.3	7192.2	$(2^-,3,4)$	
		4571.2	5.3	7100.8	$(1^-$ to $4^+)$	
		4626@		7046	$(3^-,4^+)$	
		4848.0	18	6824.0	$(2^+,3^-)$	
		5050.3	7.7	6621.6	$(1^-,2,3^-)$	
		5070.3	18	6601.59	4^-	
		5176.1	29	6495.8	$(2^-,3^-)$	
		5186.5	8.8	6485.4	$(1^-,2,3^-)$	
		5333.3	12	6338.6	$1^-,2^-,3^-$	
		5395.8	24	6276.1	4^+	
		5422.0	7.1	6249.9	2^+	
		5458.1	47	6213.8	(2^+)	
		5618.7	47	6053.2	(4^+)	
		5630.1	11	6041.8	$(3^-,4^+)$	
		5814.3	5.9	5857.5	$(2)^-$	
		5846.9	8.2	5824.9	3^-	
		6158.5@	6.5	5513.3	3^-	
		6322.3@	5.3	5349.4	4^+	
		6514.4	8.8	5157.3	2^+	
		6588.1	59	5083.6	$(2)^-$	
		6794.6	14	4877.0	3^-	
		7106.1	7.7	4565.5	2^+	
		7191.6	18	4479.98	4^-	
		7735.0	18	3936.5	2^+	
		7861.2	100	3810.18	3^-	
		9503.6	18	2167.472	2^+	
11682.7	(4^+)	x				I_γ: 28% γ absolute branching is unobserved. Additional information 124.
		4394.1	12	7288.32	6^+	
		5406.2	12	6276.1	4^+	
		5432.4	20	6249.9	2^+	
		5629.1	8.0	6053.2	(4^+)	
		5640.5	8.0	6041.8	$(3^-,4^+)$	
		5857.3	44	5824.9	3^-	
		6168.9	8.0	5513.3	3^-	
		6332.7	100	5349.4	4^+	
		6805.0	12	4877.0	3^-	
		7096.1	12	4585.87	5^-	
		7116.5	8.0	4565.5	2^+	
		7871.6	44	3810.18	3^-	

From ENSDF

$^{38}_{18}Ar_{20}$-74

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Comments
11703.5	(3$^-$,4$^+$)	x				I_γ: 36% γ absolute branching is unobserved. Additional information 125.
		3711	20	7992	(1$^-$,2,3$^-$)	
		4020	30	7683	(3$^-$,4$^+$)	
		4164	10	7539	(3,4,5)	
		4469.4	30	7233.8	(1$^-$ to 4$^+$)	
		4602.4	30	7100.8	(1$^-$ to 4$^+$)	
		4799.4	40	6903.8	2$^-$,3$^-$	
		4879.2	20	6824.0	(2$^+$,3$^-$)	
		5081.5	10	6621.6	(1$^-$,2,3$^-$)	
		5101.5	10	6601.59	4$^-$	
		5217.7	10	6485.4	(1$^-$,2,3$^-$)	
		5427.0	10	6276.1	4$^+$	
		5489.3	10	6213.8	(2$^+$)	
		5649.8	80	6053.2	(4$^+$)	
		6189.7	10	5513.3	3$^-$	
		6353.5	50	5349.4	4$^+$	
		6825.8	80	4877.0	3$^-$	
		7116.9	20	4585.87	5$^-$	
		7137.3	20	4565.5	2$^+$	
		7222.8	30	4479.98	4$^-$	
		7766.1	100	3936.5	2$^+$	
		7892.4	20	3810.18	3$^-$	
11716.6	(2$^+$)	x				I_γ: 29% γ absolute branching is unobserved. Additional information 126.
		5094.6	6.9	6621.6	(1$^-$,2,3$^-$)	
		5230.8	3.5	6485.4	(1$^-$,2,3$^-$)	
		5377.6	3.5	6338.6	1$^-$,2$^-$,3$^-$	
		5502.4	14	6213.8	(2$^+$)	
		5506.8	3.5	6209.4	4$^-$	
		5674.3	3.5	6041.8	(3$^-$,4$^+$)	
		5741.3	3.5	5974.8	(0$^+$ to 3$^-$)	
		5982.2	10	5733.9	1$^-$	
		6558.7	21	5157.3	2$^+$	
		6838.9	28	4877.0	3$^-$	
		7006.6	3.5	4709.3	0$^+$	
		7779.2	21	3936.5	2$^+$	
		7905.5	3.5	3810.18	3$^-$	
		8338.7	6.9	3376.9	0$^+$	
		9547.8	14	2167.472	2$^+$	
		11714.7	100	0.0	0$^+$	

From ENSDF

$^{38}_{18}Ar_{20}$-75

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11731.2	(4$^+$)	x				I_γ: 33% γ absolute branching is unobserved. Additional information 127.
		4827.1	33	6903.8	2$^-$,3$^-$	
		4906.9	53	6824.0	(2$^+$,3$^-$)	
		5454.7	13	6276.1	4$^+$	
		5517.0	20	6213.8	(2$^+$)	
		5677.5	100	6053.2	(4$^+$)	
		5688.9	20	6041.8	(3$^-$,4$^+$)	
		5905.8	13	5824.9	3$^-$	
		6072.1	27	5658.61	5$^-$	
		6136.1	33	5594.6	2$^+$	
		6381.2	13	5349.4	4$^+$	
		6853.5	13	4877.0	3$^-$	
		7144.6	6.7	4585.87	5$^-$	
		7165.0	73	4565.5	2$^+$	
		7250.5	6.7	4479.98	4$^-$	
		7793.8	6.7	3936.5	2$^+$	
		7920.1	6.7	3810.18	3$^-$	
		9562.4	6.7	2167.472	2$^+$	
11755.6	(3$^-$,4$^+$)	x				I_γ: 47% γ absolute branching is unobserved. Additional information 128.
		5541.4	14	6213.8	(2$^+$)	
		6160.5	14	5594.6	2$^+$	
		6241.7	50	5513.3	3$^-$	
		7189.4	36	4565.5	2$^+$	
		7274.9	86	4479.98	4$^-$	
		7818.2	71	3936.5	2$^+$	
		7944.5	7.1	3810.18	3$^-$	
		9586.8	100	2167.472	2$^+$	
11775.0	4$^+$	x				I_γ: 39% γ absolute branching is unobserved. Additional information 129.
		4092	67	7683	(3$^-$,4$^+$)	
		4236	47	7539	(3,4,5)	
		4486.4	100	7288.32	6$^+$	
		5498.5	53	6276.1	4$^+$	
		5721.3	73	6053.2	(4$^+$)	
		6261.1	13	5513.3	3$^-$	
		7188.4	27	4585.87	5$^-$	
		7963.9	20	3810.18	3$^-$	
		9606.2	6.7	2167.472	2$^+$	
11780.7	(1,2,3)$^-$	x				I_γ: 29% γ absolute branching is unobserved. Additional information 130.

From ENSDF

$^{38}_{18}Ar_{20}$-76

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11780.7	$(1,2,3)^-$	4492	42	7288.32	6^+	
		5284.5	11	6495.8	$(2^-,3^-)$	
		5426.8	16	6353.5	1^-	
		5955.3	21	5824.9	3^-	
		6185.6	16	5594.6	2^+	
		6266.8	32	5513.3	3^-	
		6622.8	100	5157.3	2^+	
		7843.3	53	3936.5	2^+	
		7969.6	11	3810.18	3^-	
		9611.9	74	2167.472	2^+	
11790.5	(2^+)	x				I_γ: 51% γ absolute branching is unobserved. Additional information 131.
		4886.4	20	6903.8	$2^-,3^-$	
		5294.3	20	6495.8	$(2^-,3^-)$	
		5580.7	60	6209.4	4^-	
		5736.8	20	6053.2	(4^+)	
		5748.2	30	6041.8	$(3^-,4^+)$	
		5932.5	30	5857.5	$(2)^-$	
		6195.4	70	5594.6	2^+	
		6276.6	100	5513.3	3^-	
		7080.5	10	4709.3	0^+	
		7224.3	50	4565.5	2^+	
		7853.1	10	3936.5	2^+	
		7979.4	50	3810.18	3^-	
		9621.7	10	2167.472	2^+	
		11788.5	10	0.0	0^+	
11794.5	$(1^-,2^+,3^-,4^+)$	x				I_γ: 53% γ absolute branching is unobserved. Additional information 132.
		6280.6	6.8	5513.3	3^-	
		9625.7	100	2167.472	2^+	
11797.9	$(1^-,2,3,4^+)$	x				I_γ: 43% γ absolute branching is unobserved. Additional information 133.
		5301.7	36	6495.8	$(2^-,3^-)$	
		5583.7	54	6213.8	(2^+)	
		5755.6	62	6041.8	$(3^-,4^+)$	
		5939.9	27	5857.5	$(2)^-$	
		6202.8	46	5594.6	2^+	
		6284.0	100	5513.3	3^-	
		7231.7	81	4565.5	2^+	
		7860.5	18	3936.5	2^+	
		7986.8	73	3810.18	3^-	
		9629.1	18	2167.472	2^+	

From ENSDF

$^{38}_{18}Ar_{20}$-77

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
11800.1	(1,2$^+$)	x				I_γ: 19% γ absolute branching is unobserved. Additional information 134.
		5942.1	14	5857.5	(2)$^-$	
		6065.7	12	5733.9	1$^-$	
		6715.9	9.3	5083.6	(2)$^-$	
		7233.9	9.3	4565.5	2$^+$	
		9631.3	44	2167.472	2$^+$	
		11798.1	100	0.0	0$^+$	
11805.9	3$^-$	x				I_γ: 39% γ absolute branching is unobserved. Additional information 135.
		4374.6	4.8	7431.0	(2$^-$,3,4$^+$)	
		5555.6	13	6249.9	2$^+$	
		5752.2	3.9	6053.2	(4$^+$)	
		6210.8	17	5594.6	2$^+$	
		6455.9	10	5349.4	4$^+$	
		6648.0	5.2	5157.3	2$^+$	
		6721.7	13	5083.6	(2)$^-$	
		6928.2	13	4877.0	3$^-$	
		7239.7	100	4565.5	2$^+$	
		7325.2	8.7	4479.98	4$^-$	
		7868.5	30	3936.5	2$^+$	
		7994.8	11	3810.18	3$^-$	
		9637.1	35	2167.472	2$^+$	
11812.2	(1,2$^+$)	x				I_γ: 38% γ absolute branching is unobserved. Additional information 136.
		9643.4	3.3	2167.472	2$^+$	
		11810.2	100	0.0	0$^+$	
11823.1	(3$^-$,4$^+$)	x				I_γ: 72% γ absolute branching is unobserved. Additional information 137.
		5221.1	100	6601.59	4$^-$	
		5546.6	17	6276.1	4$^+$	
		5572.8	42	6249.9	2$^+$	
		5613.3	25	6209.4	4$^-$	
		5997.7	17	5824.9	3$^-$	
		6164.0	8.3	5658.61	5$^-$	
		7236.5	25	4585.87	5$^-$	
11832.0	3$^-$	x				I_γ: 61% γ absolute branching is unobserved. Additional information 138.
		6954.3	36	4877.0	3$^-$	
		7245.4	43	4585.87	5$^-$	
		7265.8	29	4565.5	2$^+$	
		7894.6	50	3936.5	2$^+$	

From ENSDF

$^{38}_{18}Ar_{20}$-78

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11832.0	3⁻	8020.9	21	3810.18	3⁻			
		9663.2	100	2167.472	2⁺			
11873.8	(3,4⁺)	x						I_γ: 39% γ absolute branching is unobserved. Additional information 139.
		5597.3	13	6276.1	4⁺			
		5820.1	25	6053.2	(4⁺)			
		6015.8	19	5857.5	(2)⁻			
		6715.9	13	5157.3	2⁺			
		6789.5	44	5083.6	(2)⁻			
		6996.1	69	4877.0	3⁻			
		7307.5	31	4565.5	2⁺			
		7393.0	56	4479.98	4⁻			
		7936.4	13	3936.5	2⁺			
		9705.0	100	2167.472	2⁺			
11887.8	(1,2,3)⁻	x						I_γ: 40% γ absolute branching is unobserved. Additional information 140.
		6292.6	8.3	5594.6	2⁺			
		6335.0	8.3	5552.21	1⁺,2⁺			
		6729.9	17	5157.3	2⁺			
		6803.5	29	5083.6	(2)⁻			
		7950.4	88	3936.5	2⁺			
		9719.0	100	2167.472	2⁺			
11905.7	(3⁻,4,5⁻)	x						I_γ: 67% γ absolute branching is unobserved. Additional information 141.
		5303.7	56	6601.59	4⁻			
		6246.5	89	5658.61	5⁻			
		7028.0	89	4877.0	3⁻			
		7319.1	100	4585.87	5⁻			
		8094.6	33	3810.18	3⁻			
11915.4	(10⁺)	2378 *1*	18 *5*	9537.0	8⁽⁺⁾			E_γ,I_γ: from (^{28}Si,α2pγ).
		2576.2 *8*	100 *5*	9339.2	8⁺	Q		E_γ,I_γ: from (^{28}Si,α2pγ). Mult.: from γ(DCO) in (^{28}Si,α2pγ).
11928.0	4⁻	2930	1.5 *6*	8998	(4⁺,5,6⁻)			
		3128	4.9 *3*	8800	(2⁻ to 6⁻)			
		4431	3.4 *6*	7497	(3,4,5⁻)			
		4496.7	0.6 *3*	7431.0	(2⁻,3,4⁺)			
		4578	1.5 *6*	7350	(3⁻,4⁺)			
		4638.1	1.5 *6*	7289.6	(3⁻,4⁺)			
		5023.8	2.8 *6*	6903.8	2⁻,3⁻			
		5057.7	1.5 *9*	6869.9	(2⁻,3,4⁺)			
		5326.0	100.0 *18*	6601.59	4⁻	M1(+E2)	+0.05 *8*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.

From ENSDF

$^{38}_{18}Ar_{20}$-79

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
11928.0	4⁻	5651.4	3.4 *9*	6276.1	4⁺			
		5718.1	67.9 *15*	6209.4	4⁻	M1(+E2)	−0.02 *8*	Mult.,δ: from γ(θ,pol) in (p,γ):resonances.
		5874.3	1.5 *6*	6053.2	(4⁺)			
		6102.6	1.8 *9*	5824.9	3⁻			
		6268.8	16.2 *12*	5658.61	5⁻			
		6414.1	30.9 *21*	5513.3	3⁻	(M1(+E2))	−0.03 *9*	Mult.,δ: D(+Q) from γ(θ) in (p,γ):resonances.
		6578.0	2.5 *9*	5349.4	4⁺			
		7050.3	11.3 *12*	4877.0	3⁻			
		7341.4	20.2 *12*	4585.87	5⁻	(M1+E2)	−0.20 *10*	Mult.,δ: D+Q from γ(θ) in (p,γ):resonances.
		7361.7	4.3 *9*	4565.5	2⁺			
		7447.2	21.1 *12*	4479.98	4⁻	(M1(+E2))	−0.10 *10*	Mult.,δ: D+Q from γ(θ) in (p,γ):resonances.
		7990.6	0.6 *3*	3936.5	2⁺			
		8116.9	5.8 *6*	3810.18	3⁻			
		8550.1[@]	<2.1	3376.9	0⁺			
		9759.2	3.1 *9*	2167.472	2⁺			
		11926.0[@]	<0.3	0.0	0⁺			
11997.5	(7⁻ to 11⁻)	1050 *1*	100	10947.5	(9⁻)			E_γ: from (^{28}Si,α2pγ).
12106.8	(10⁺)	2570[@] *2*	25 *8*	9537.0	8⁽⁺⁾			E_γ,I_γ: from (^{28}Si,α2pγ).
		3537 *2*	100 *17*	8569.59	8⁺			E_γ,I_γ: from (^{28}Si,α2pγ).
12394	(3⁻,4,5⁻)	x						I_γ: 48% γ absolute branching is unobserved. Additional information 142.
		6184	46	6209.4	4⁻			
		6352	4.2	6041.8	(3⁻,4⁺)			
		6735	4.2	5658.61	5⁻			
		6880	100	5513.3	3⁻			
		7516	33	4877.0	3⁻			
		7807	13	4585.87	5⁻			
		8583	4.2	3810.18	3⁻			
12405	(3⁻,4,5⁻)	x						I_γ: 48% γ absolute branching is unobserved. Additional information 143.
		6195	75	6209.4	4⁻			
		6579	10	5824.9	3⁻			
		6891	100	5513.3	3⁻			
		7527	25	4877.0	3⁻			
		7818	20	4585.87	5⁻			
		7924	25	4479.98	4⁻			
		8594	5.0	3810.18	3⁻			
13683.7	(12⁻)	2068.5 *7*	100 *6*	11614.7	11⁻	D+Q		E_γ,I_γ: from (^{28}Si,α2pγ). Mult.,δ: from γ(DCO) in (^{28}Si,α2pγ), δ=−2.7 +*6*−*8* or −0.30 +*8*−*11*.
		2134.9 *6*	97 *13*	11549.1	(10⁻)	Q		E_γ,I_γ: from (^{28}Si,α2pγ). Mult.: from γ(DCO) in (^{28}Si,α2pγ).

From ENSDF

$^{38}_{18}Ar_{20}$-80

Adopted Levels, Gammas (continued)

γ(^{38}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
14119.7	(8$^+$,9,10,11$^+$)	2821 *2*	100 *29*	11298.7	(10$^+$)		E_γ,I_γ: from (^{28}Si,α2pγ).
		4185 *3*	57 *29*	9934.0	(9$^+$)		E_γ,I_γ: from (^{28}Si,α2pγ).
14391.2	(12$^+$)	2285[@] *1*	8 *2*	12106.8	(10$^+$)		E_γ,I_γ: from (^{28}Si,α2pγ).
		2475.7 *8*	100 *8*	11915.4	(10$^+$)	Q	E_γ,I_γ: from (^{28}Si,α2pγ). Mult.: from γ(DCO) in (^{28}Si,α2pγ).
		3093 *2*	29 *8*	11298.7	(10$^+$)		E_γ,I_γ: from (^{28}Si,α2pγ).
14877.5	(12$^+$)	2962 *2*	100	11915.4	(10$^+$)		
15393.9	(13$^-$)	3779 *2*	100	11614.7	11$^-$	Q	E_γ,δ: from (^{28}Si,α2pγ).
17002.3	(14$^+$)	2611 *1*	100	14391.2	(12$^+$)		E_γ: from (^{28}Si,α2pγ).
17780.9		4097 *2*	100	13683.7	(12$^-$)		E_γ: from (^{28}Si,α2pγ).
18070?	(14$^+$)	3192[@] *3*	100	14877.5	(12$^+$)		E_γ: from (^{28}Si,α2pγ).
21662?	(16$^+$)	3592[@] *3*	100	18070?	(14$^+$)		E_γ: from (^{28}Si,α2pγ).

[†] Values with uncertainties are from (p,γ):resonances and those without uncertainties are from level-energy differences (with the latter also reported in (p,γ):resonances), unless otherwise noted.

[‡] From (p,γ):resonances, unless otherwise noted.

[#] The assignments are from $\gamma(\theta)$, $\gamma\gamma(\theta)$(DCO) and γ(lin pol) measurements. In addition, RUL for E2 and M2 transitions is used when level lifetimes are known. The measurements are primarily from the following reactions: ^{24}Mg(^{16}O,2pγ), ^{27}Al(^{14}N,n2pγ), ^{27}Al(^{16}O,αpγ), ^{16}O(^{28}Si,α2pγ) and ^{37}Cl(p,γ):resonances.

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

From ENSDF

$^{38}_{18}Ar_{20}$-81

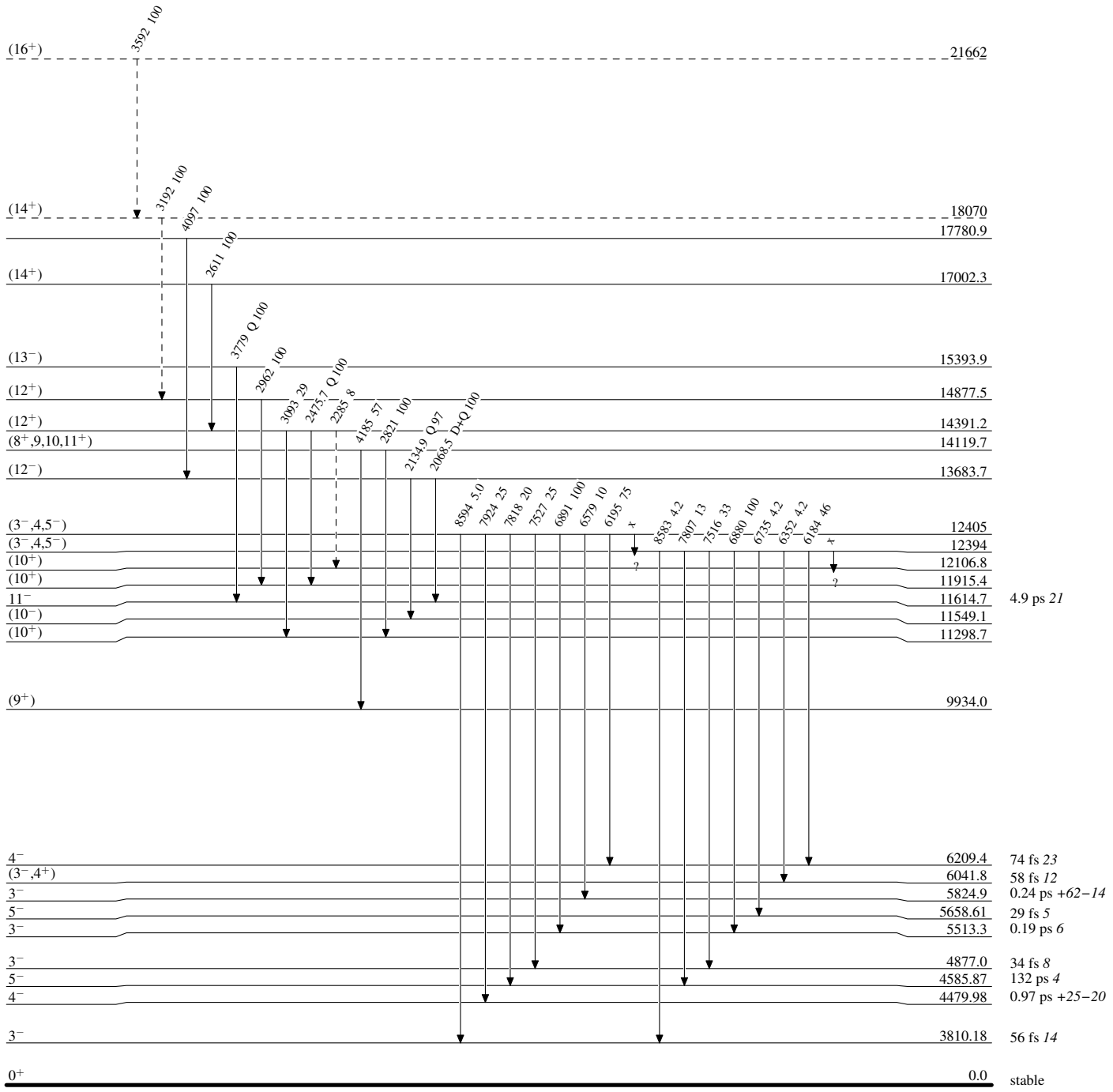
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



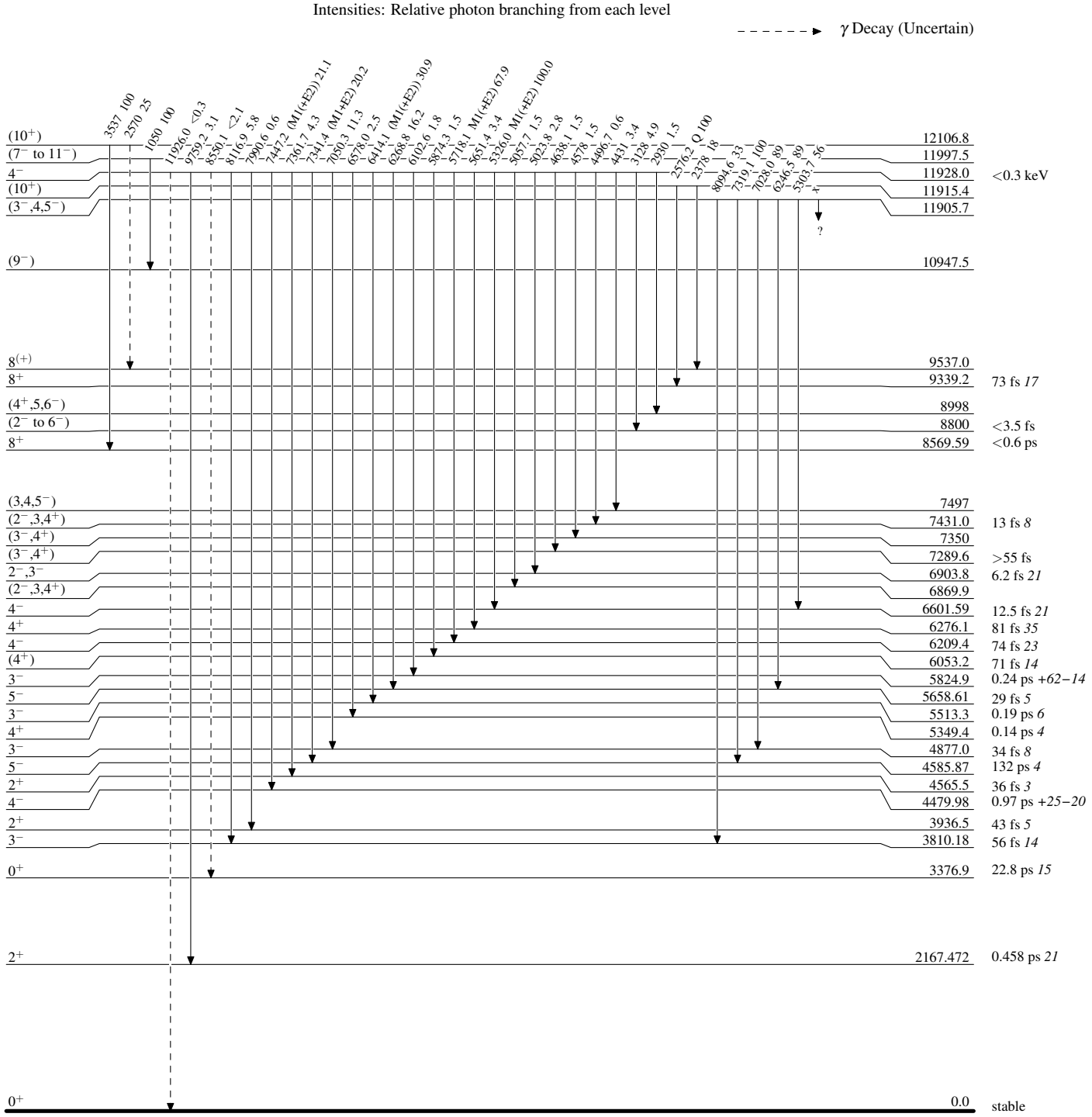
$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

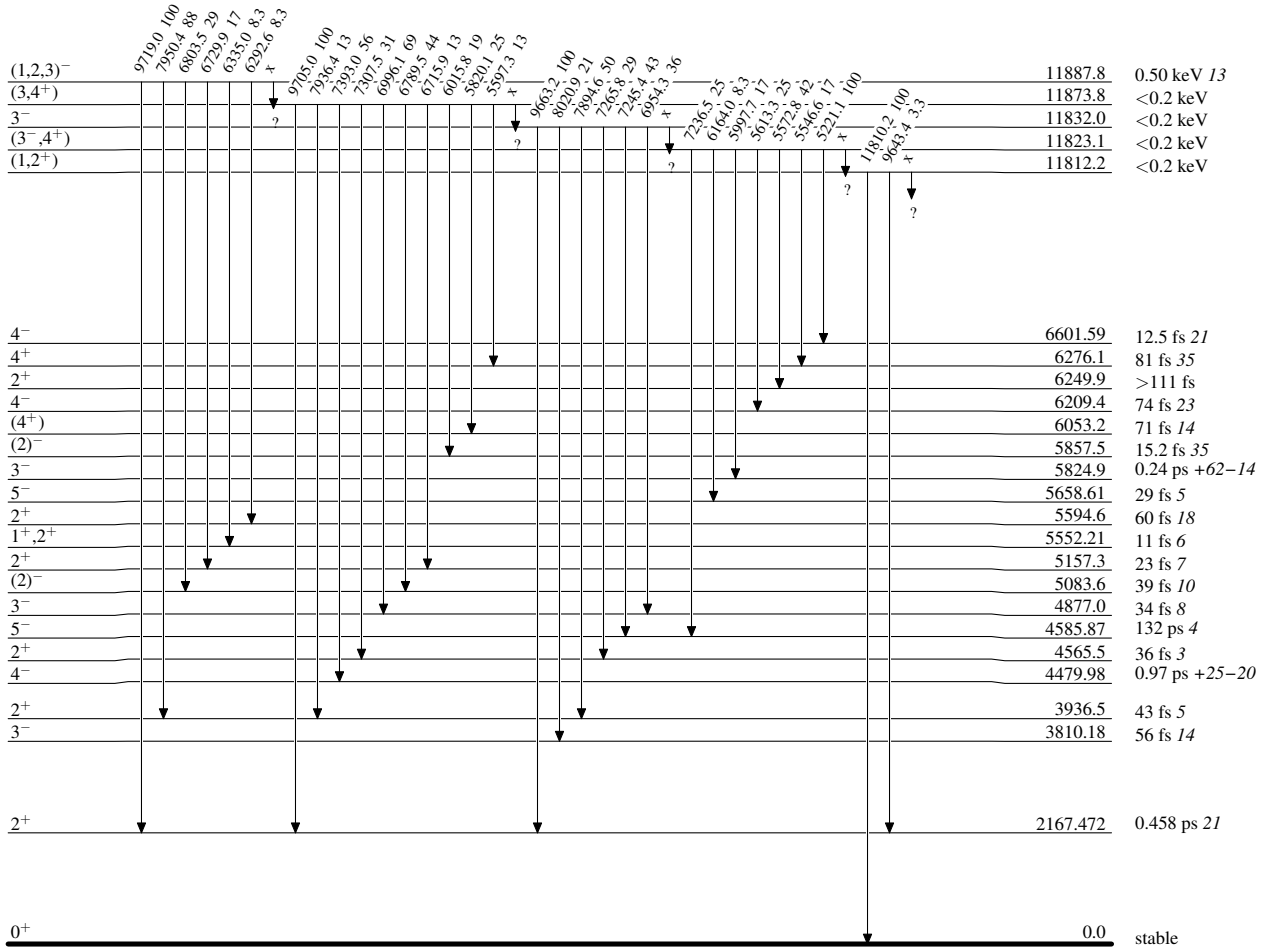


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

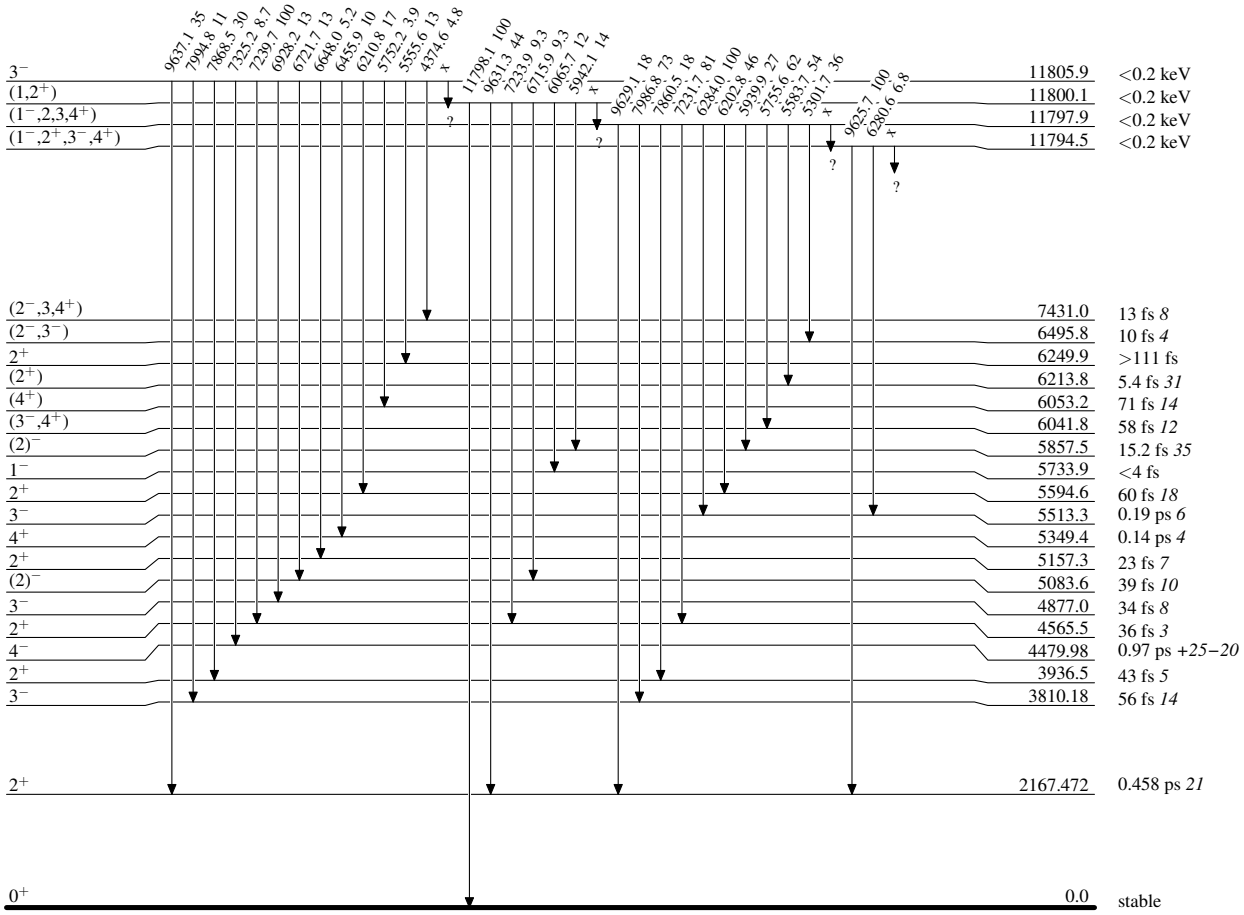


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

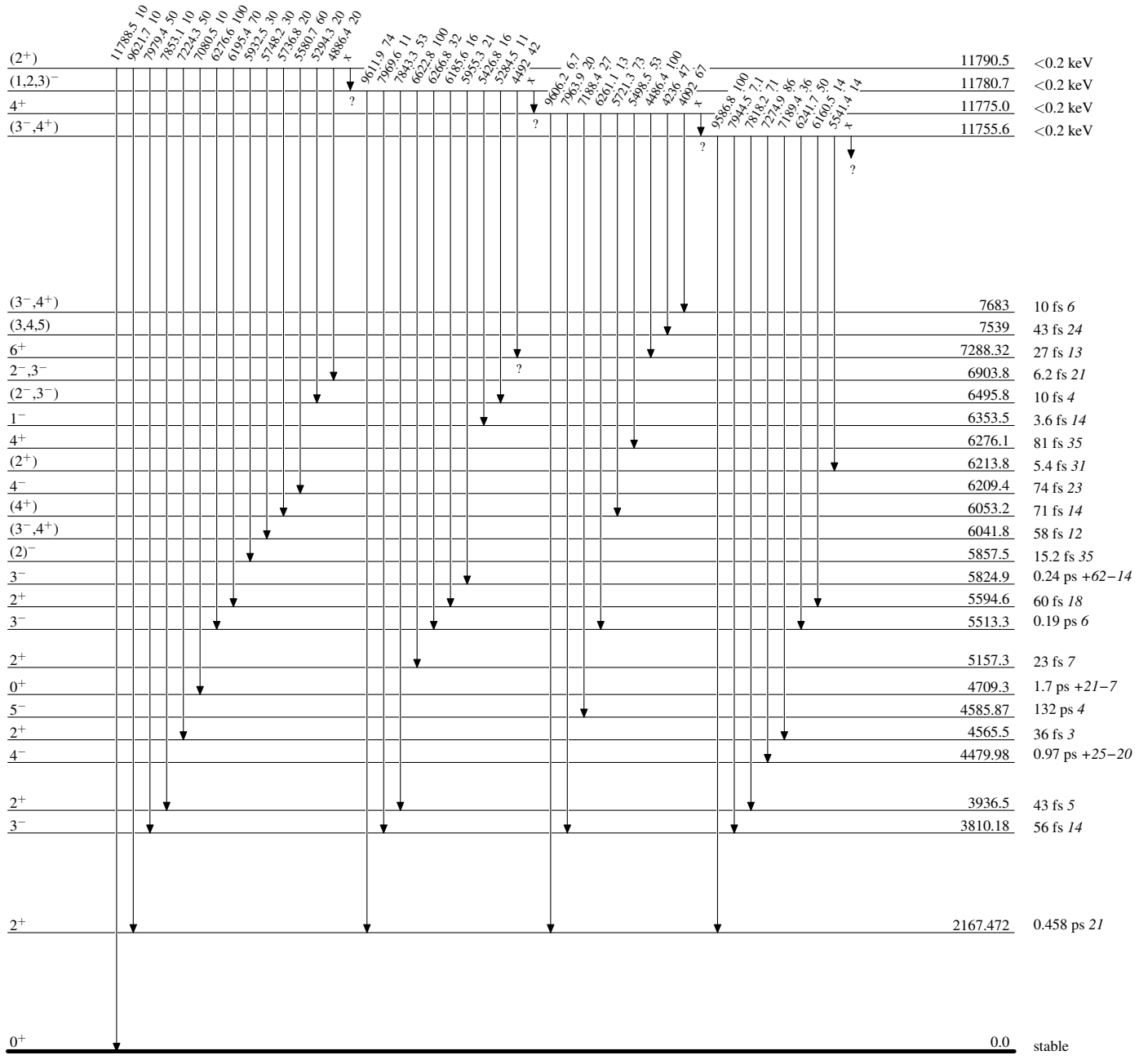


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

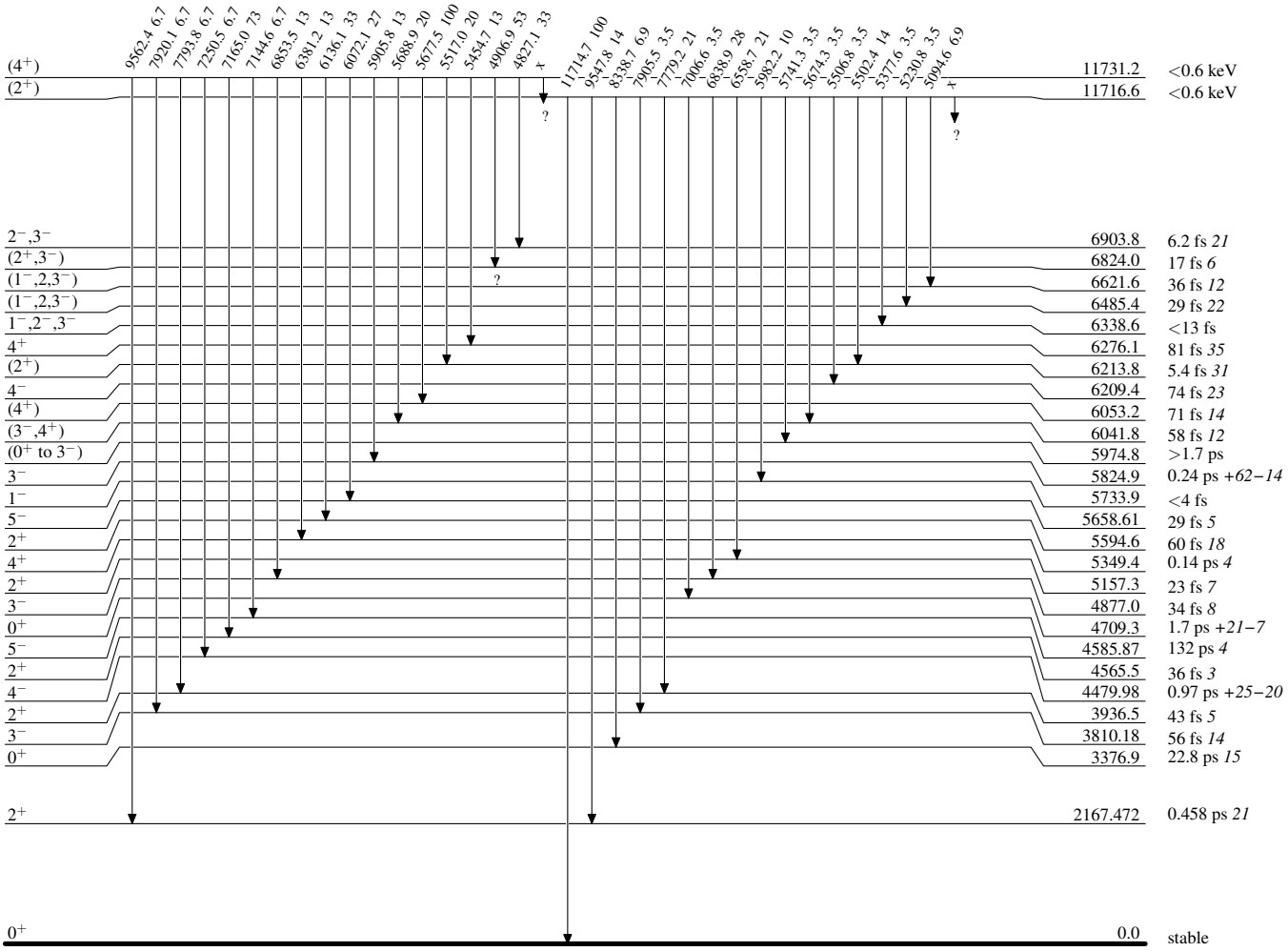


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

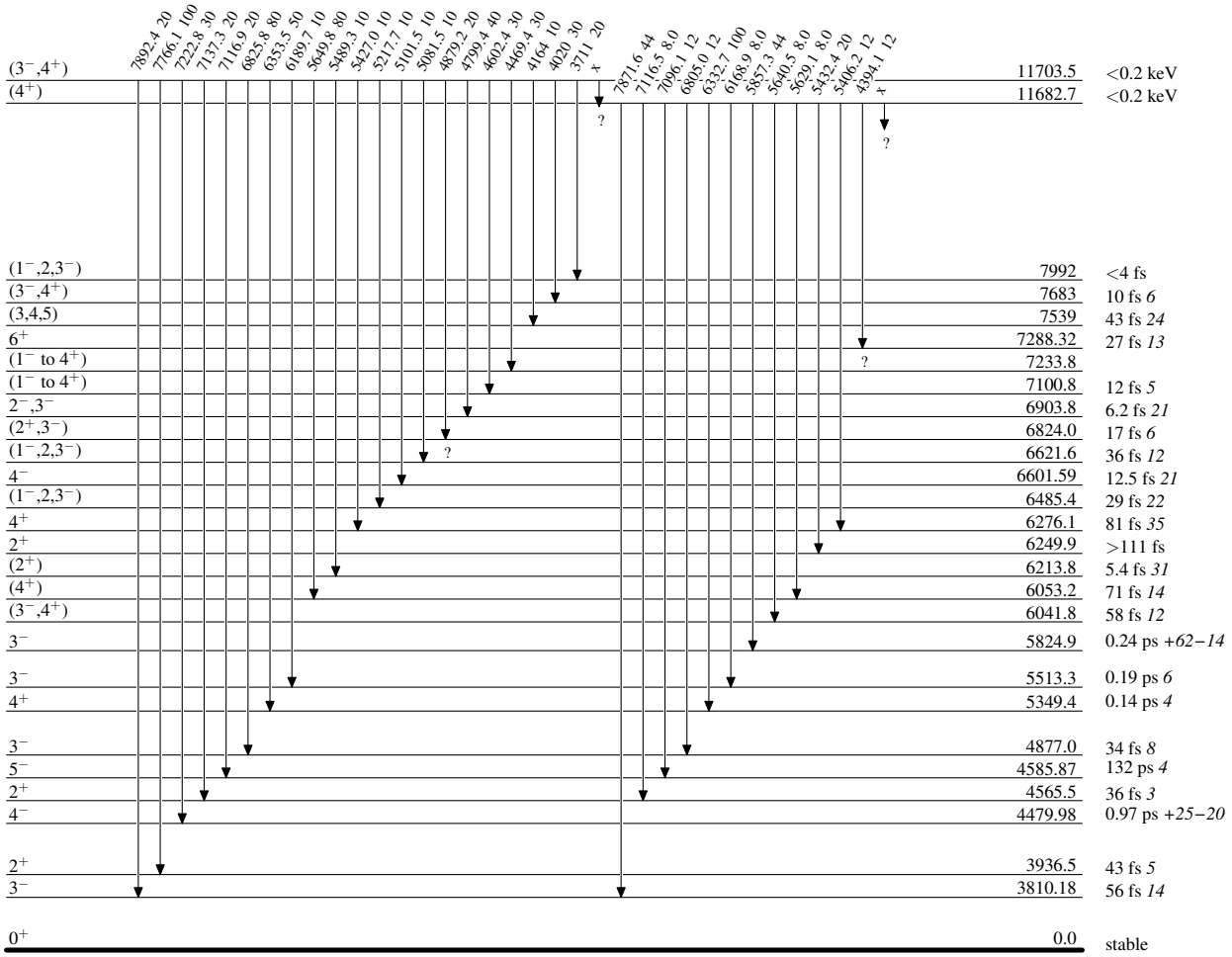


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

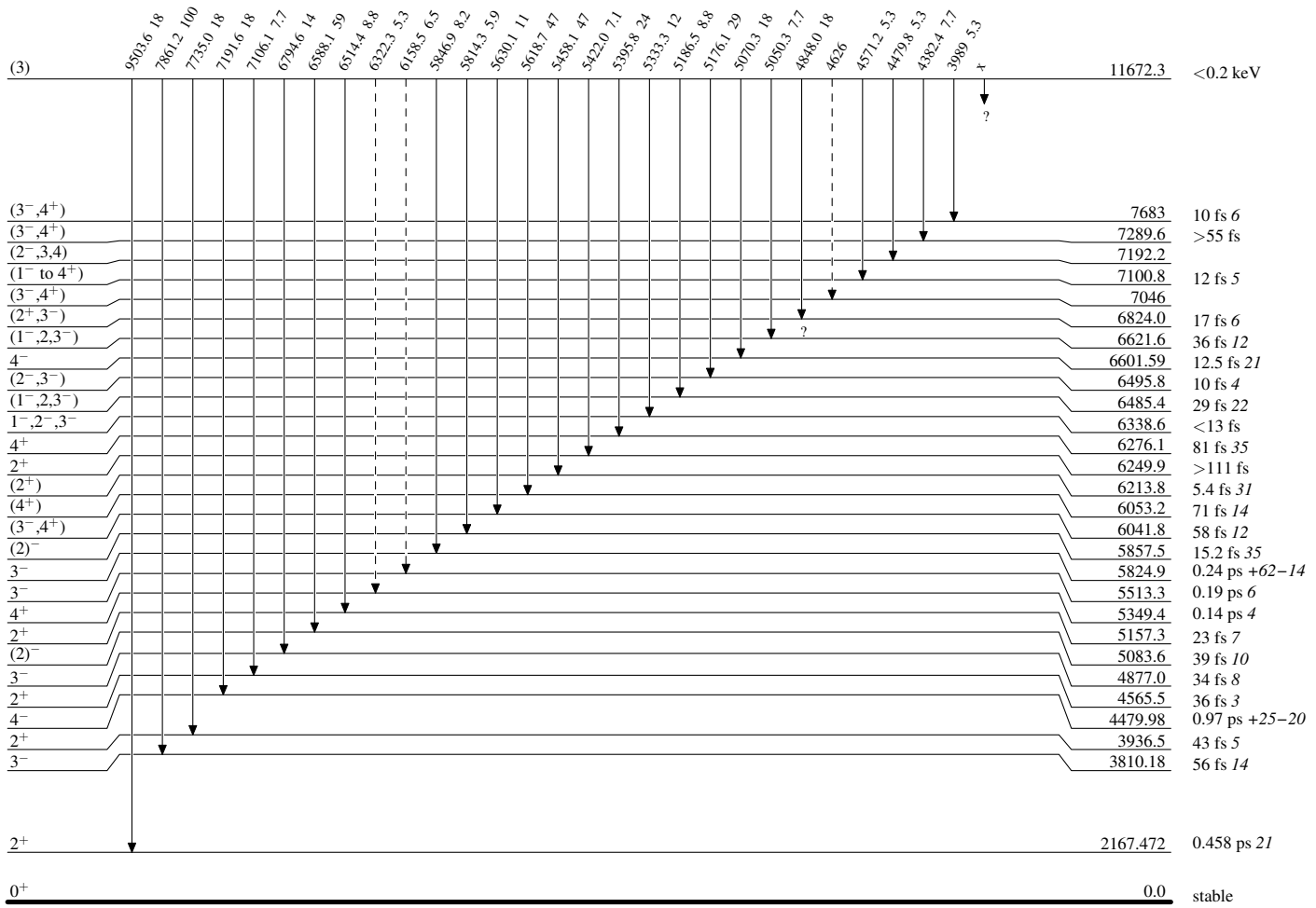
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

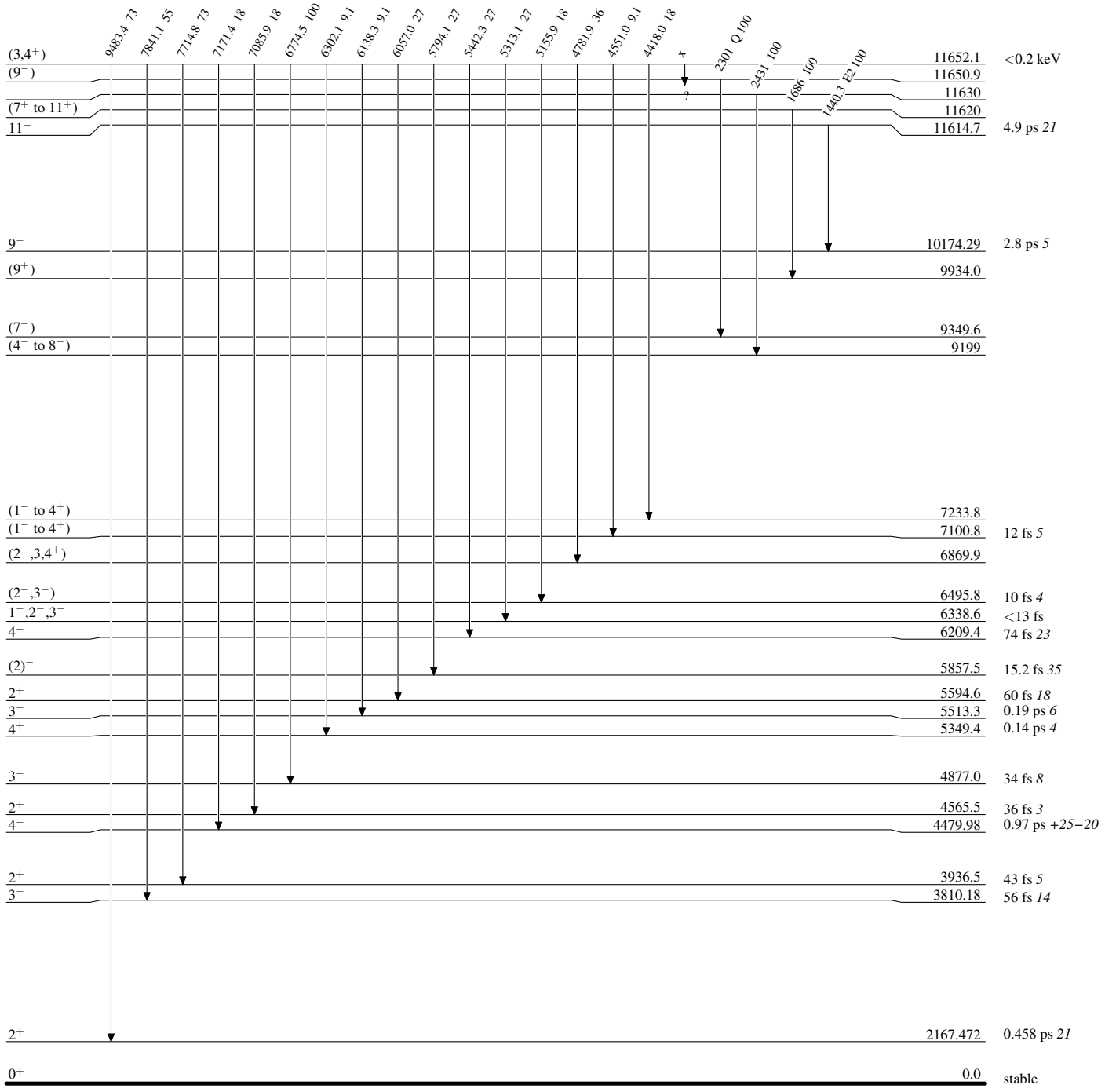


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

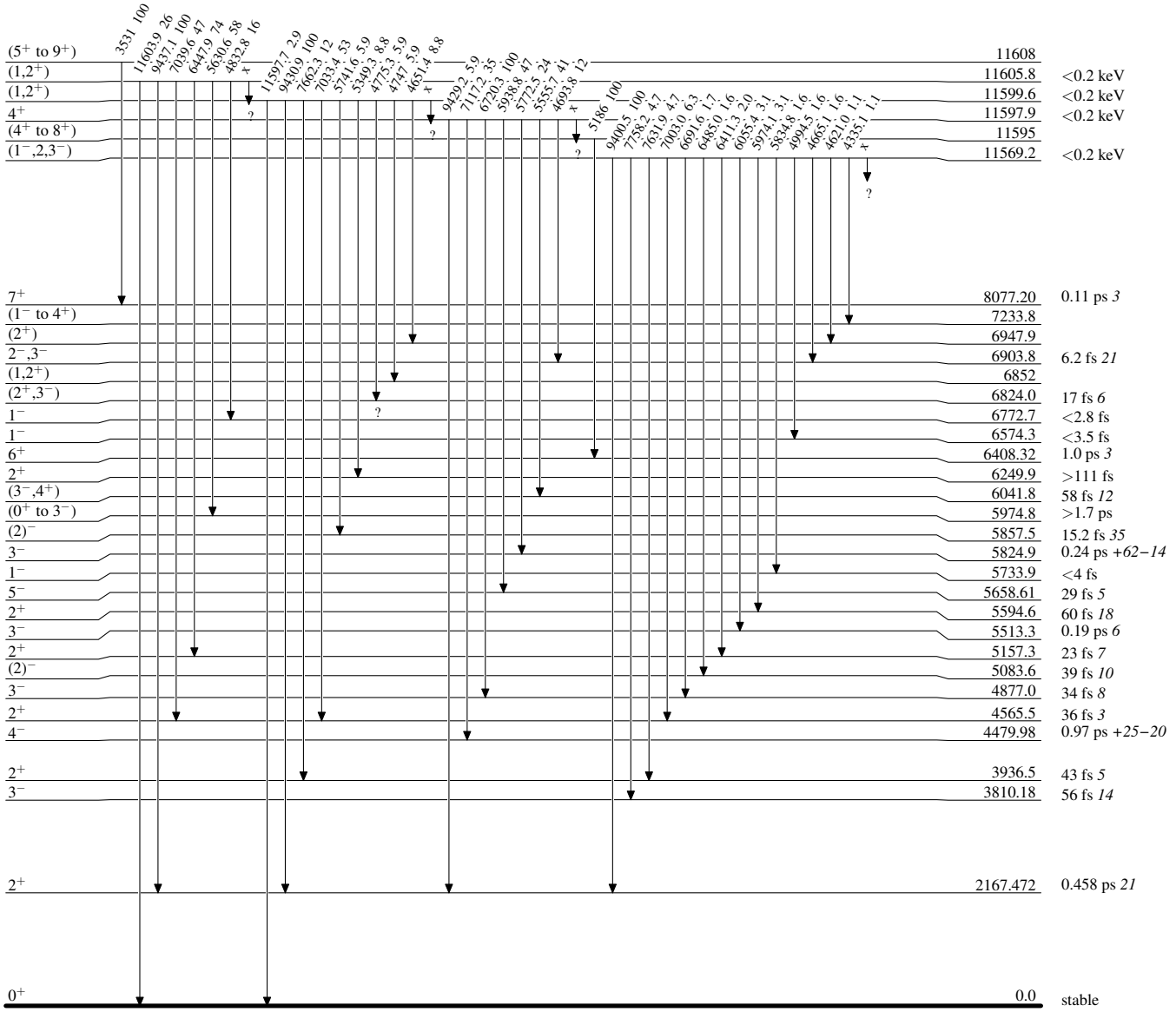


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

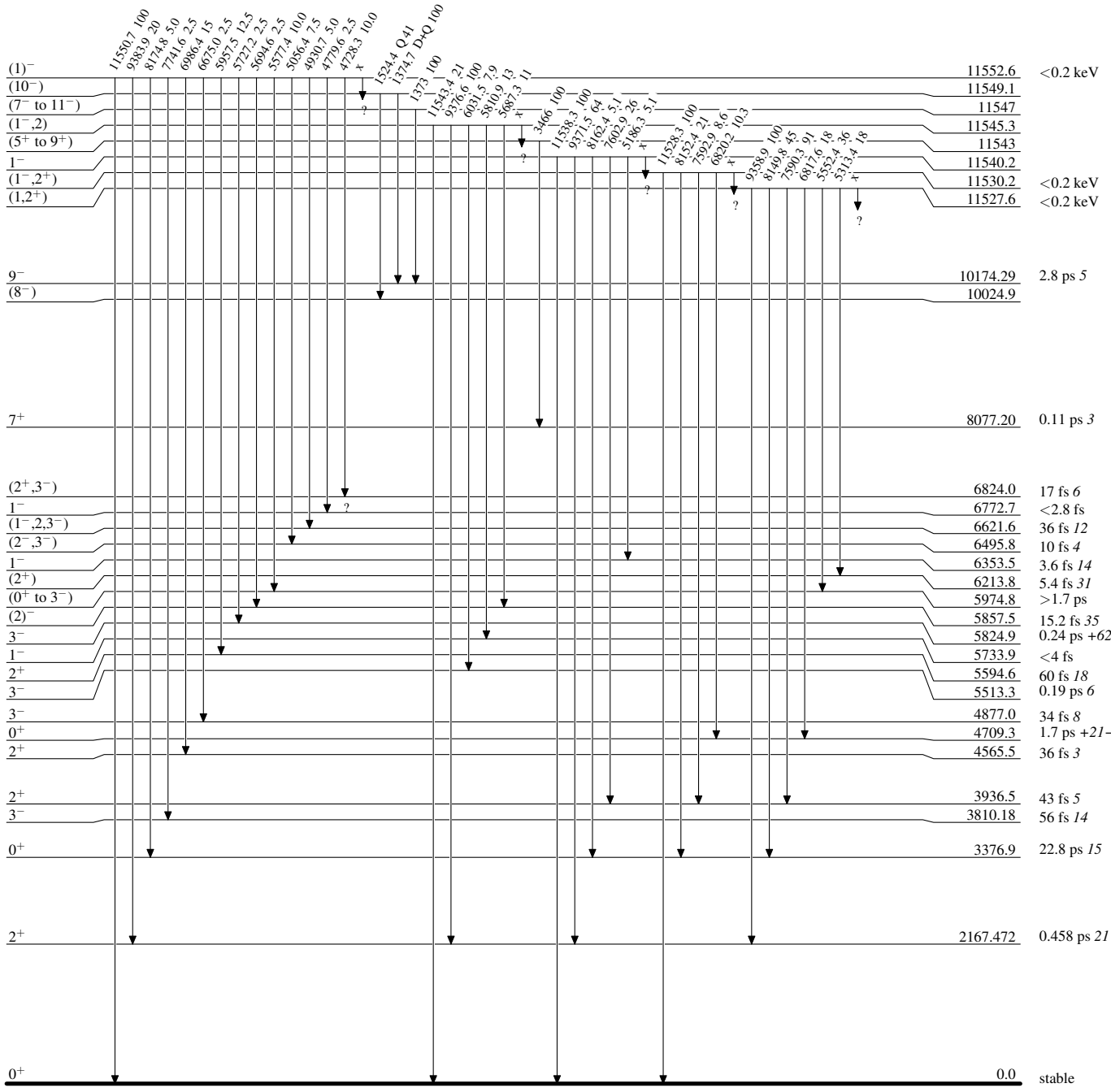


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

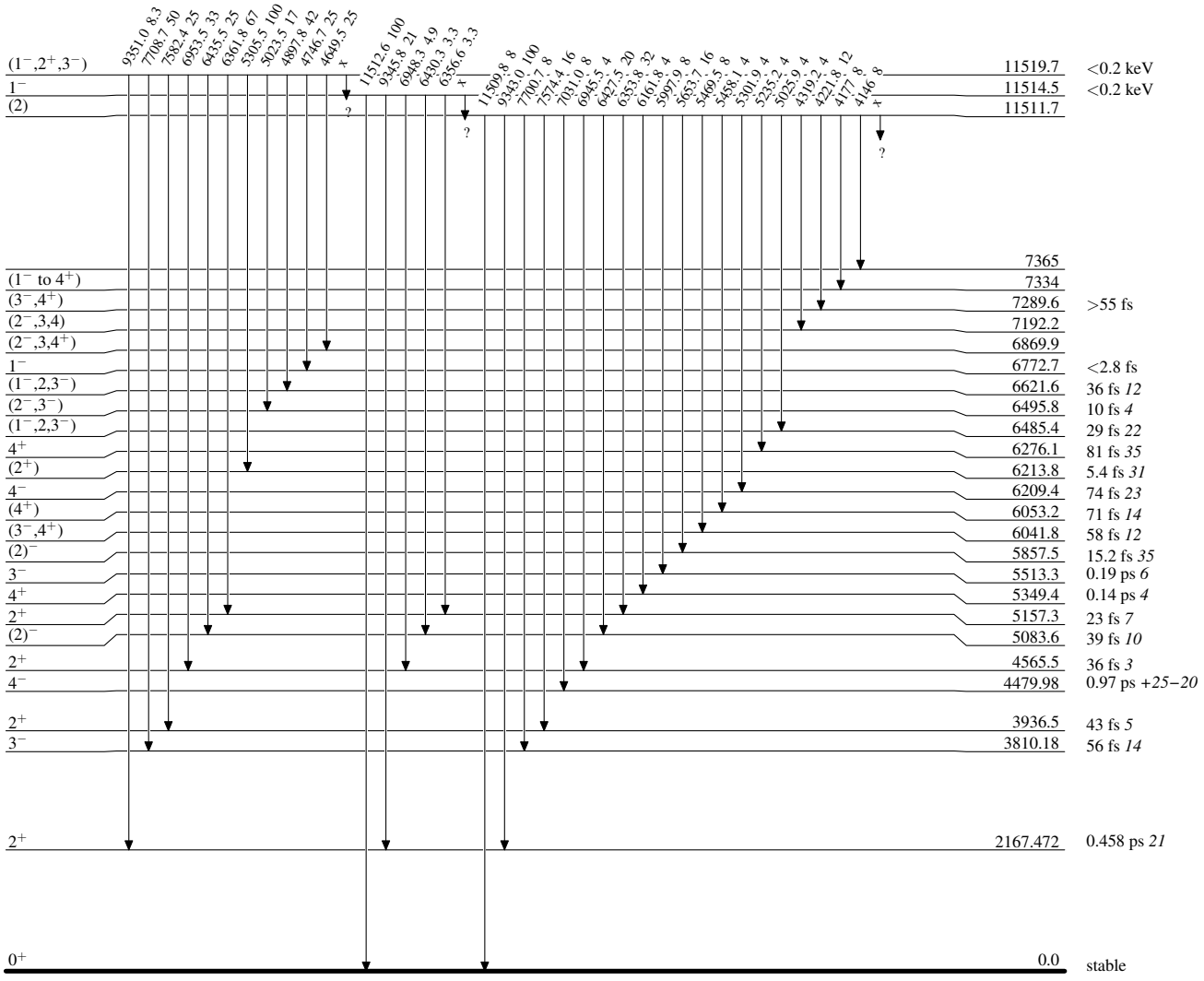


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

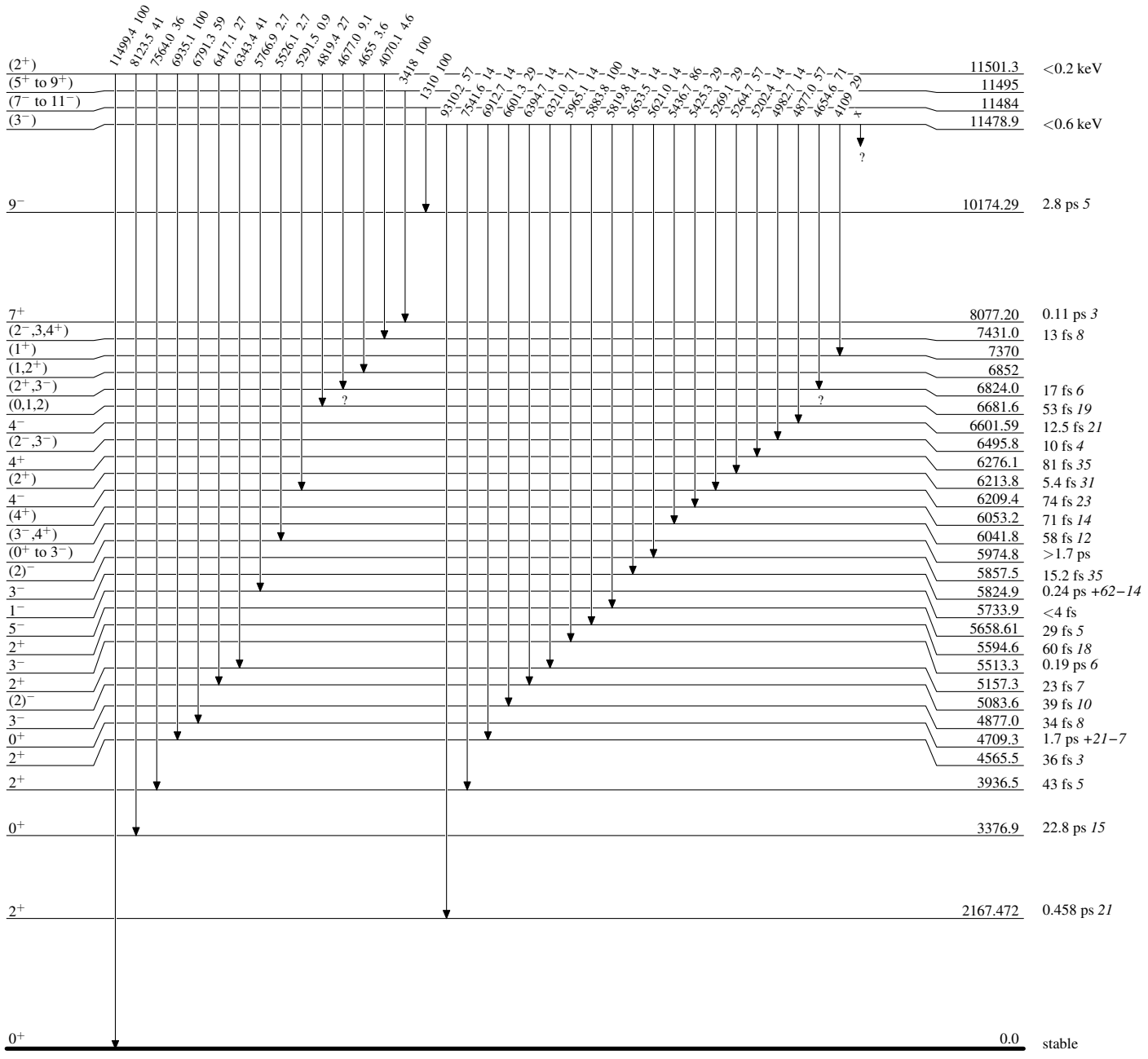


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

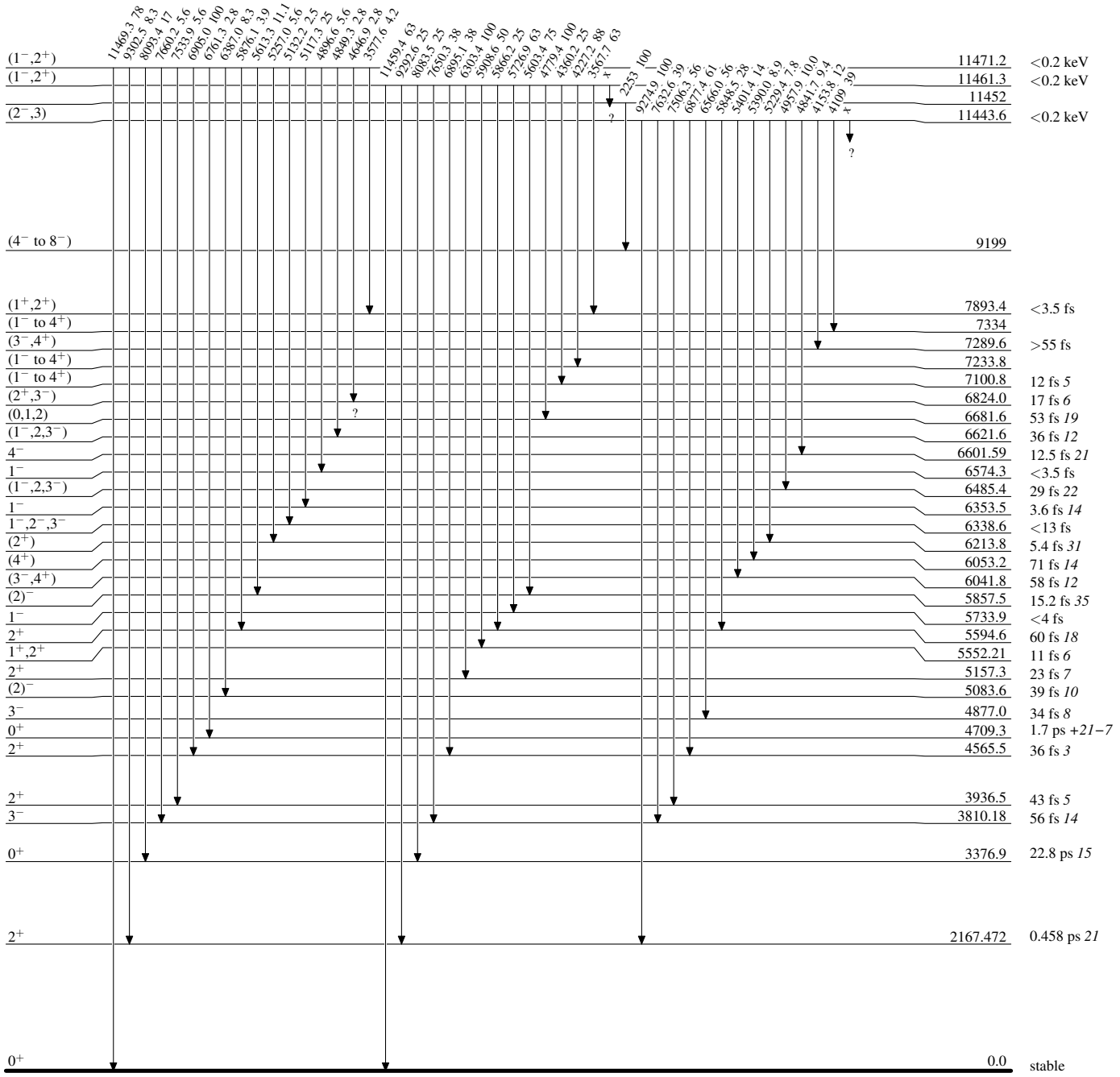


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

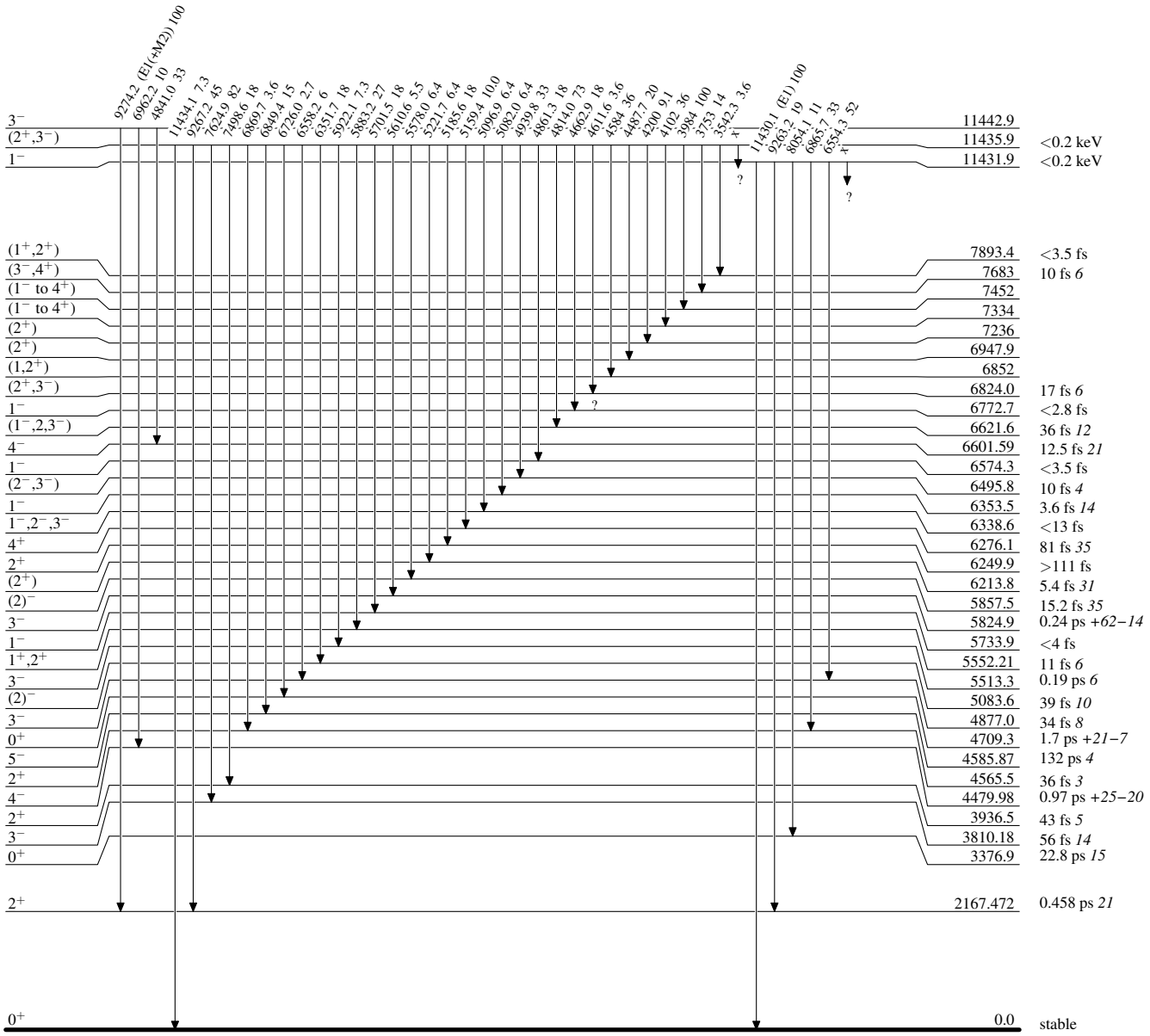


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

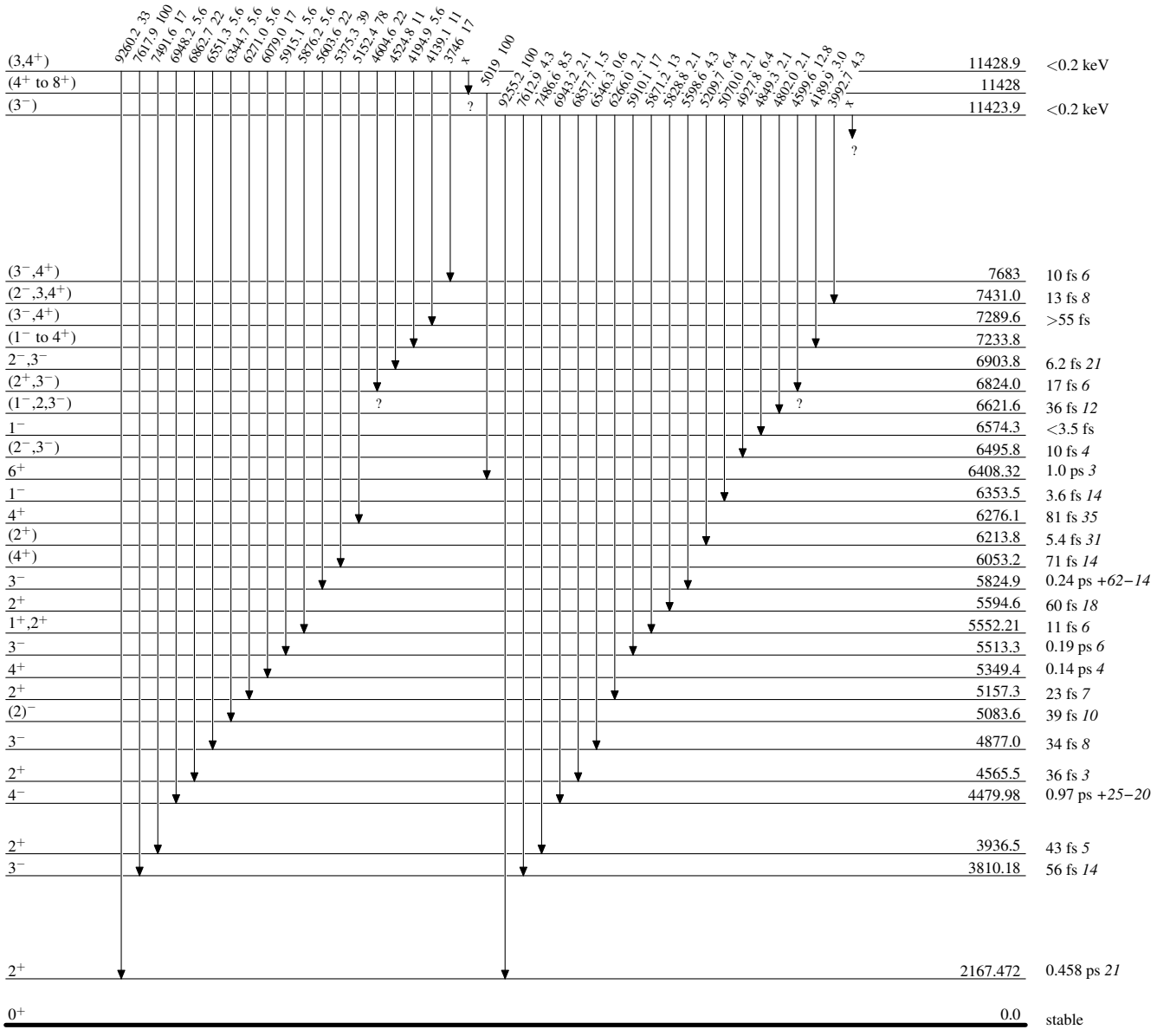


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

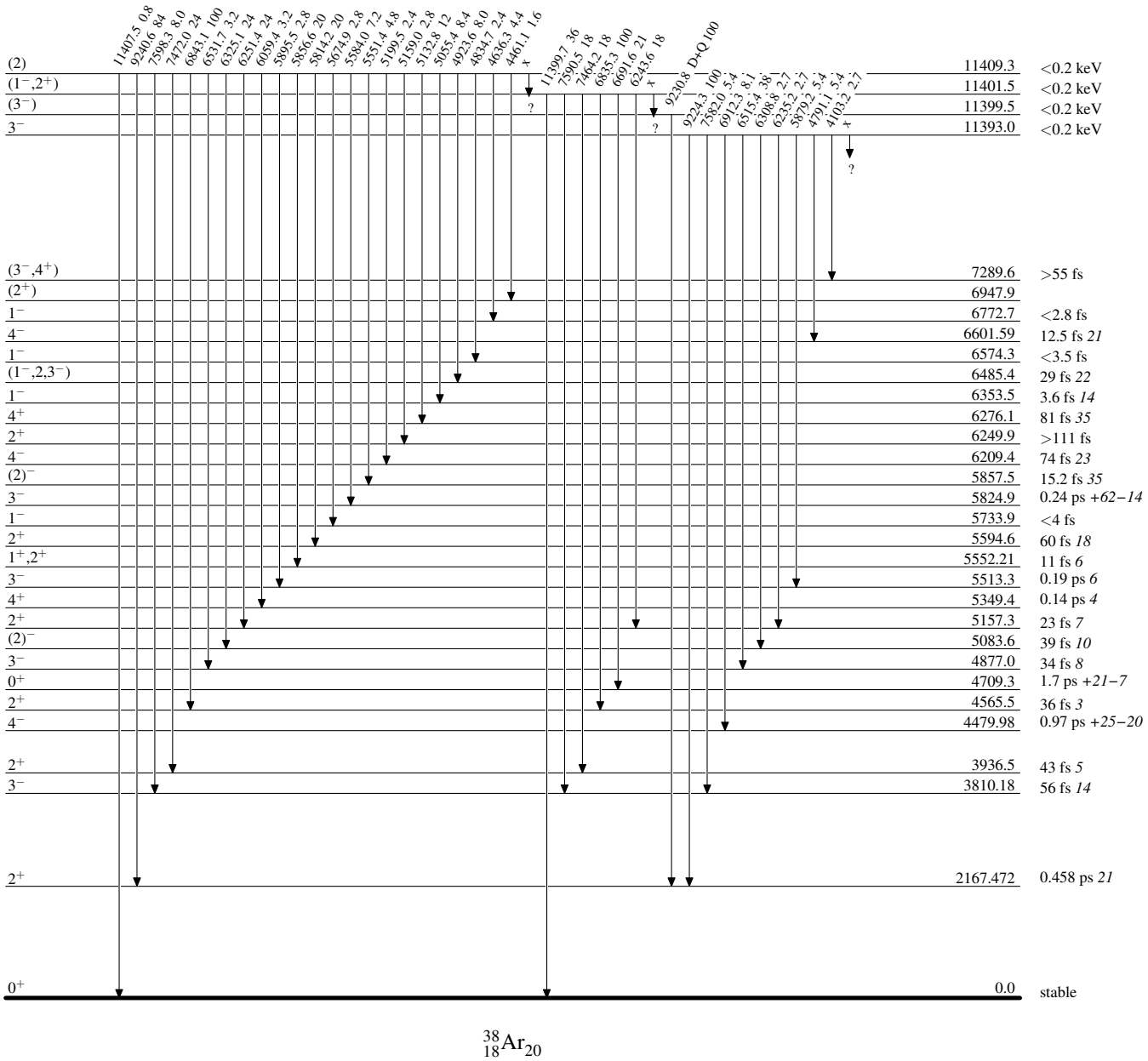


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

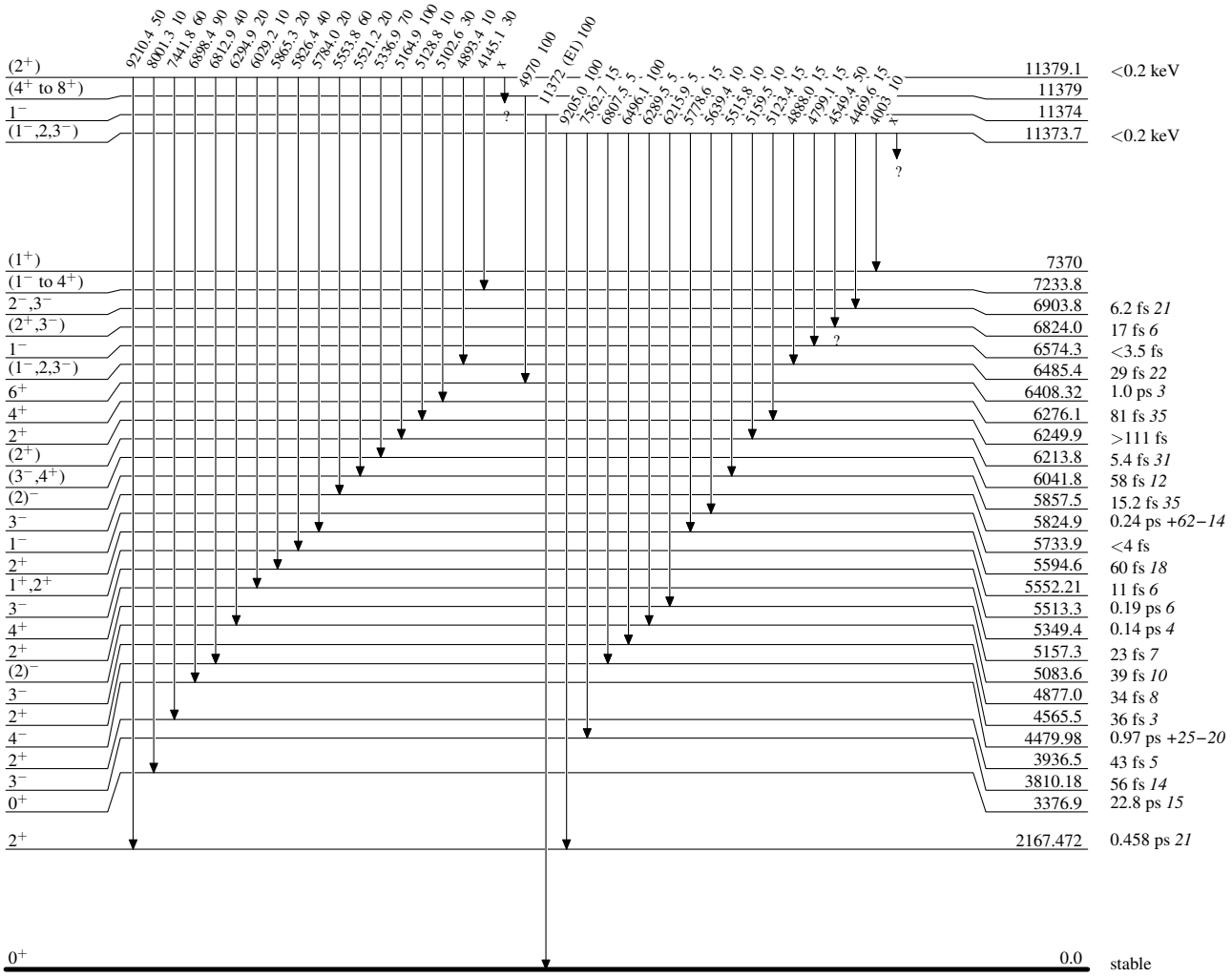
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

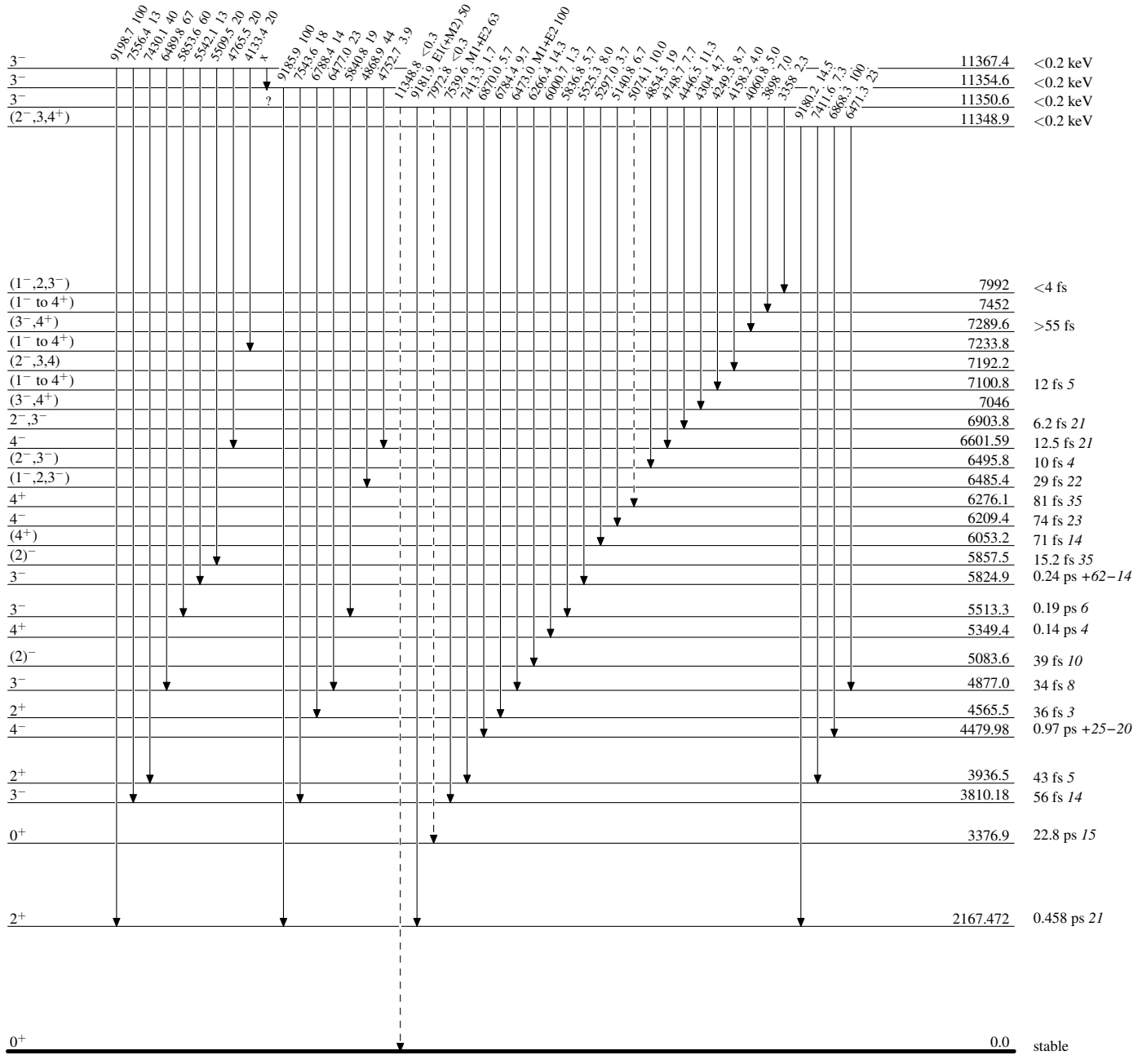
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

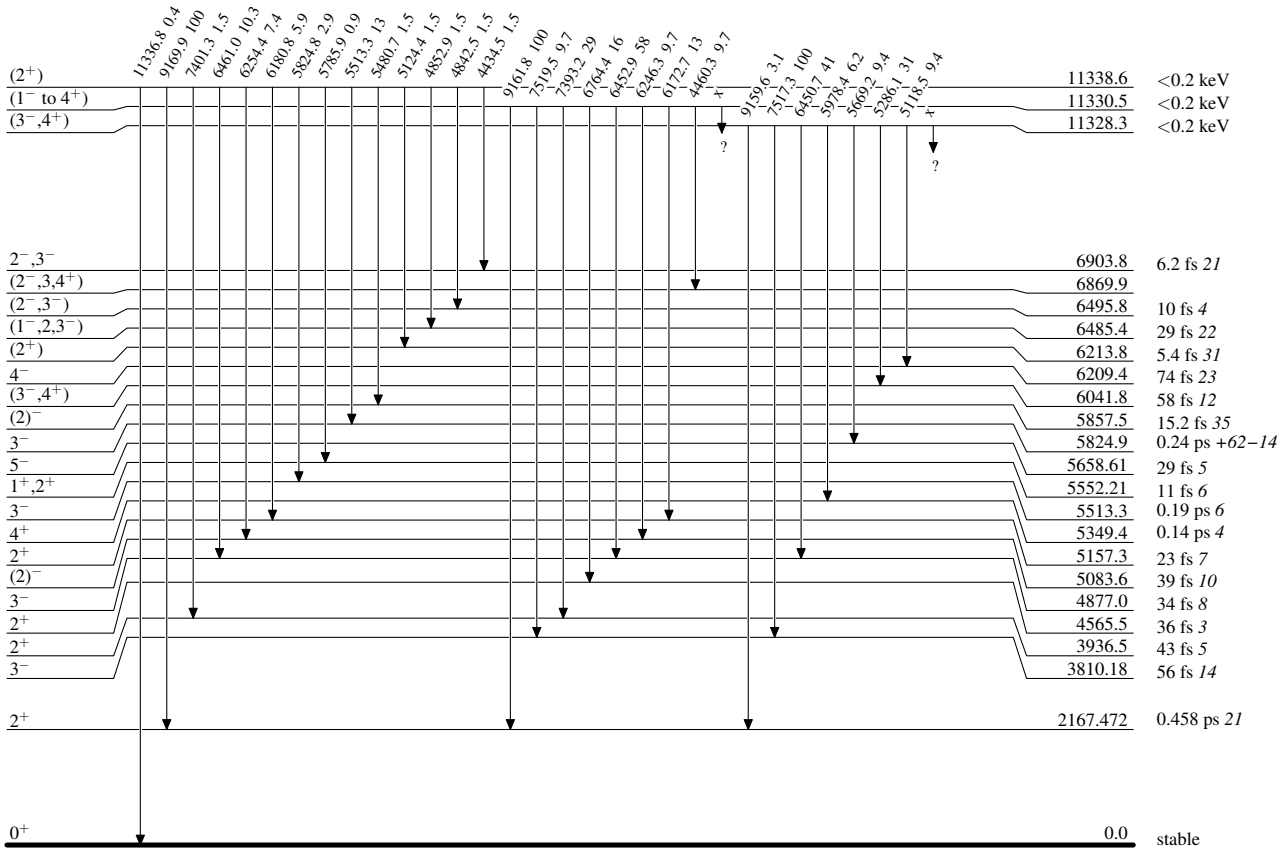


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

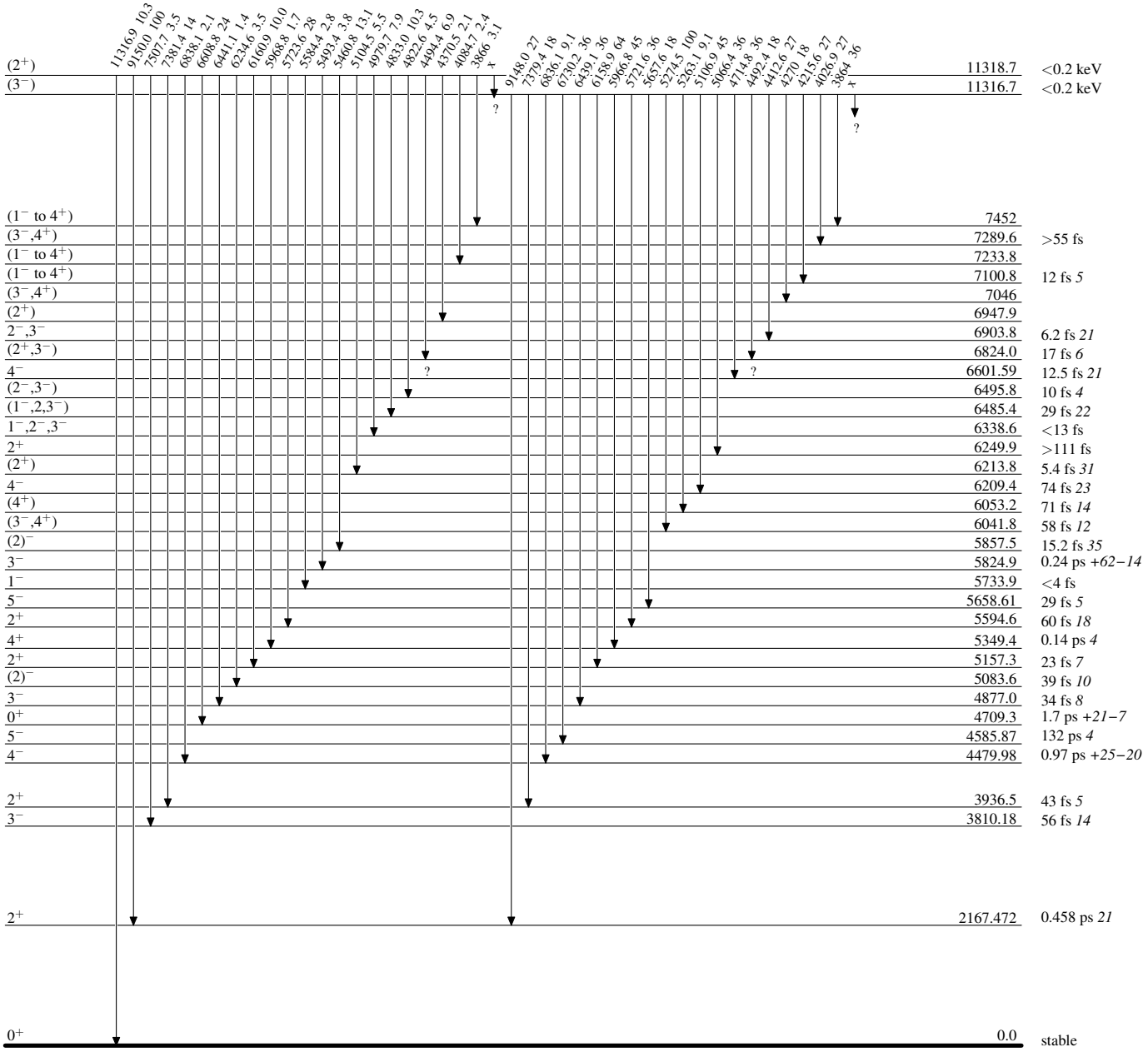


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

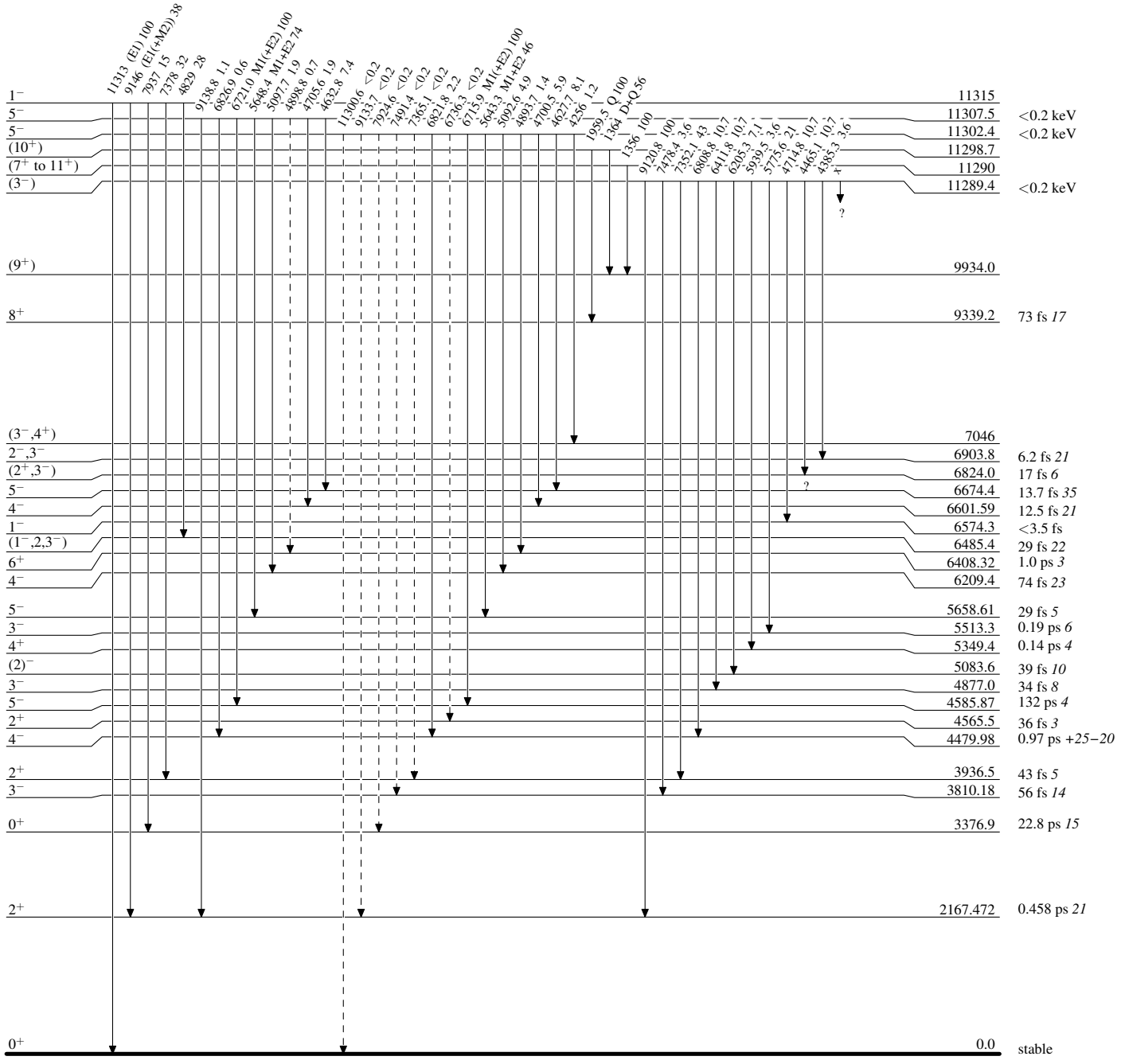
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

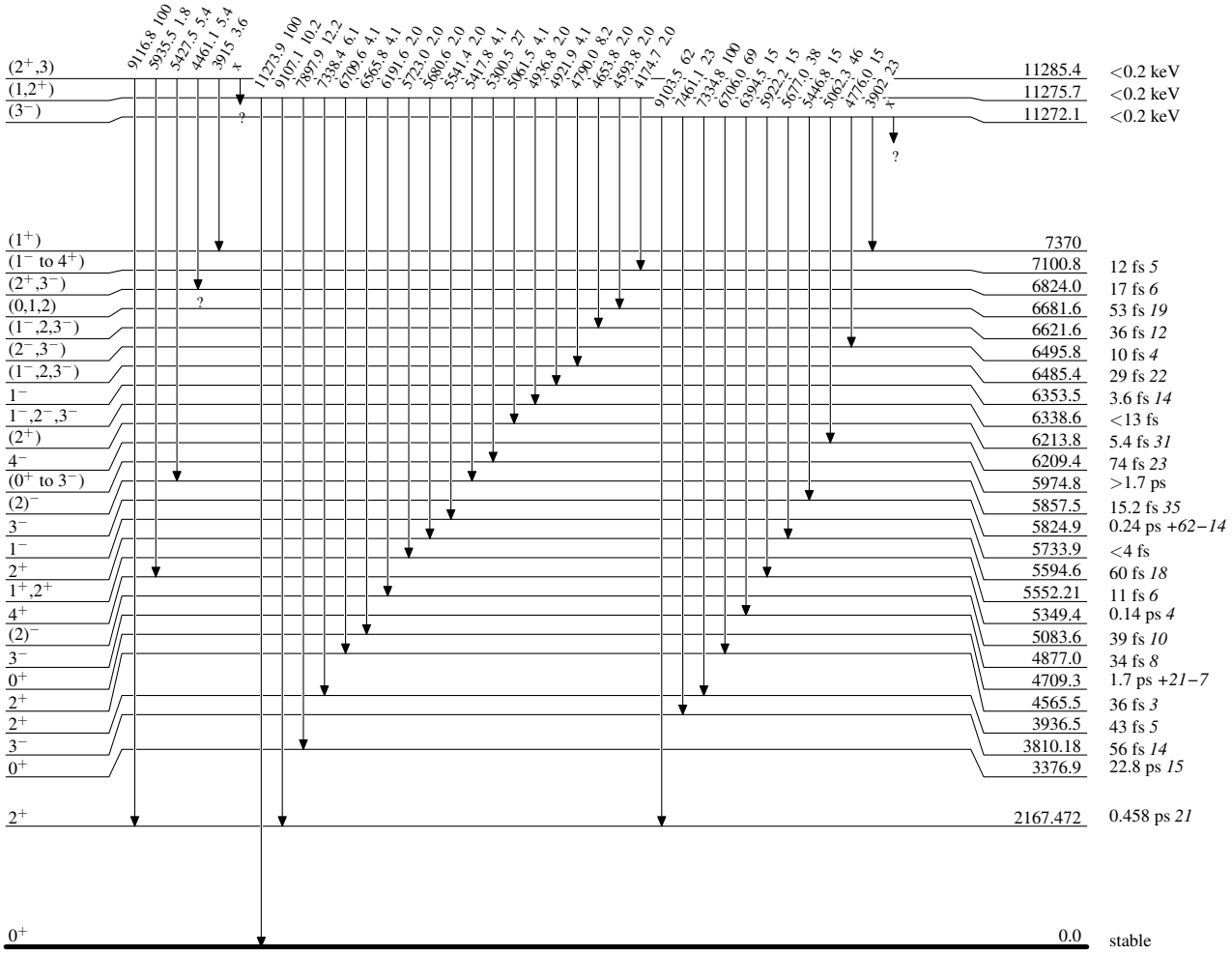


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

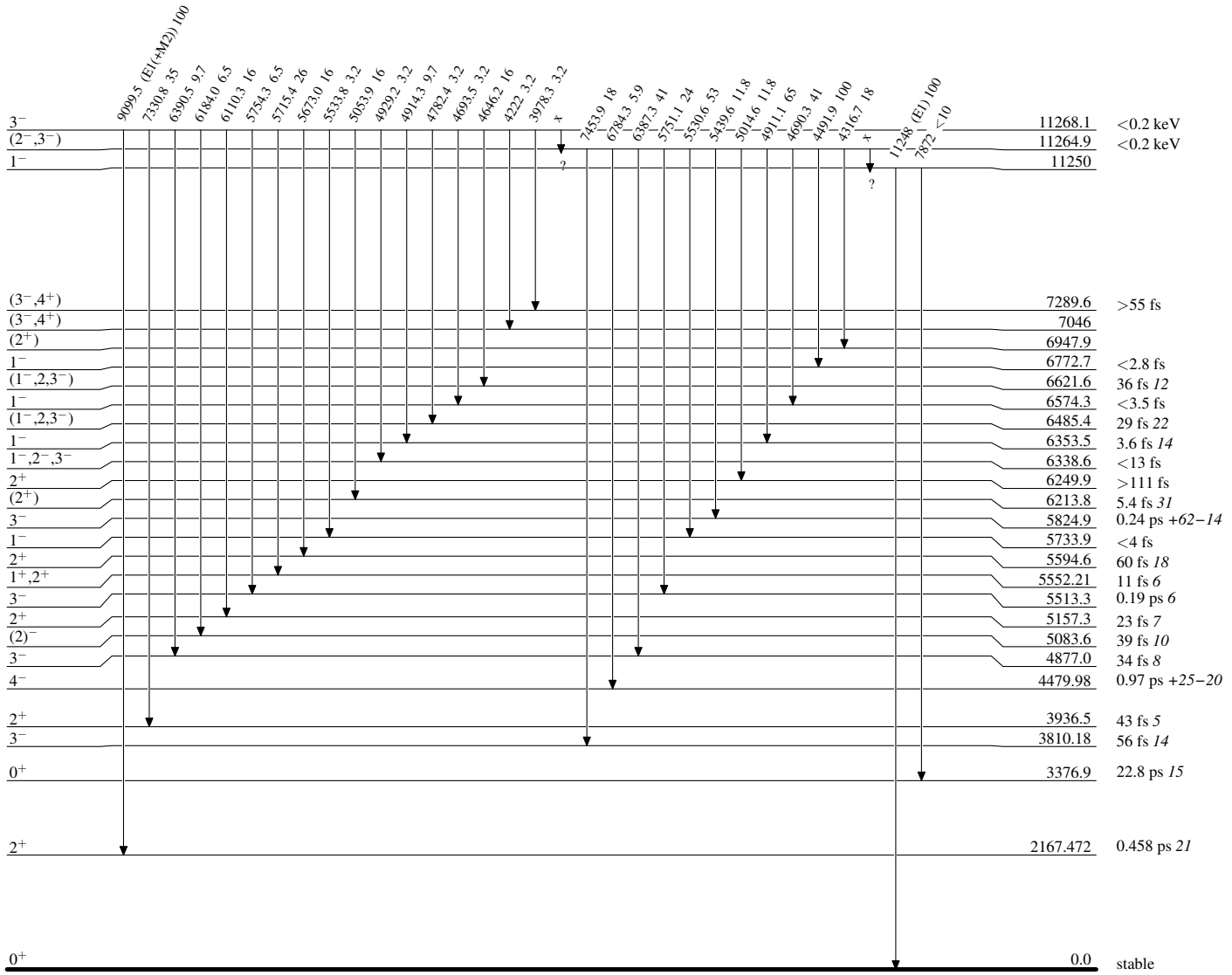


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

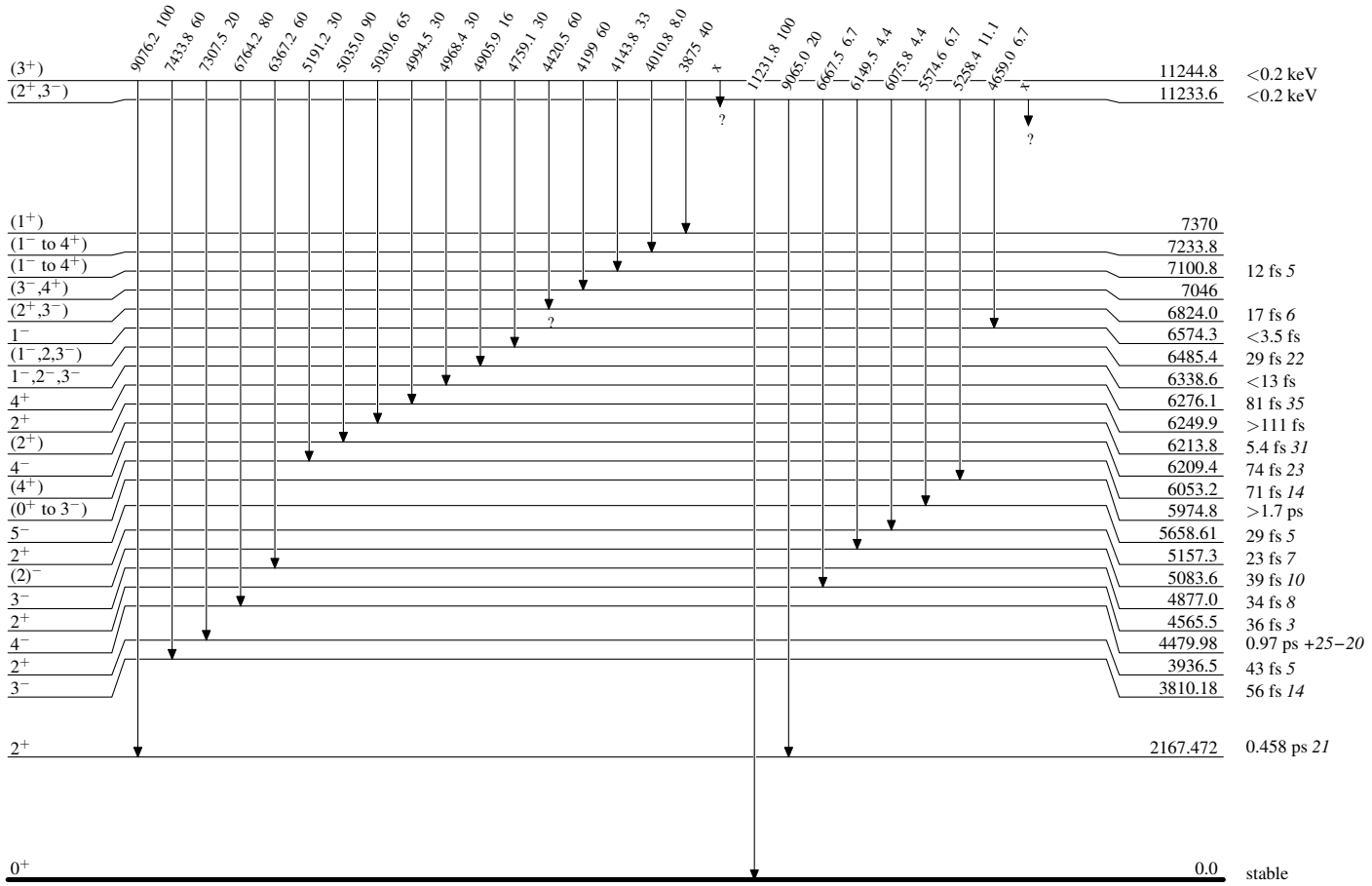


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

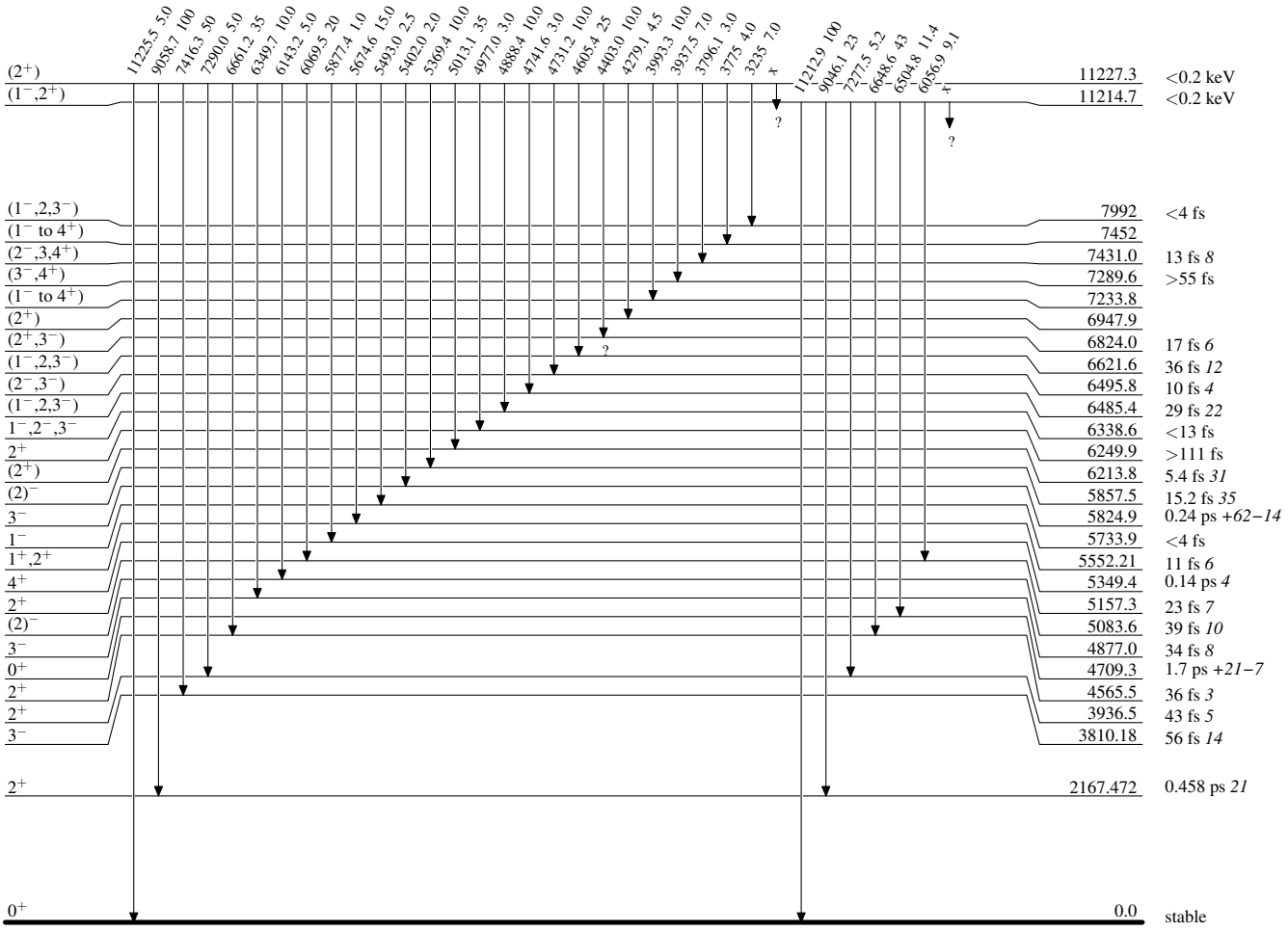


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

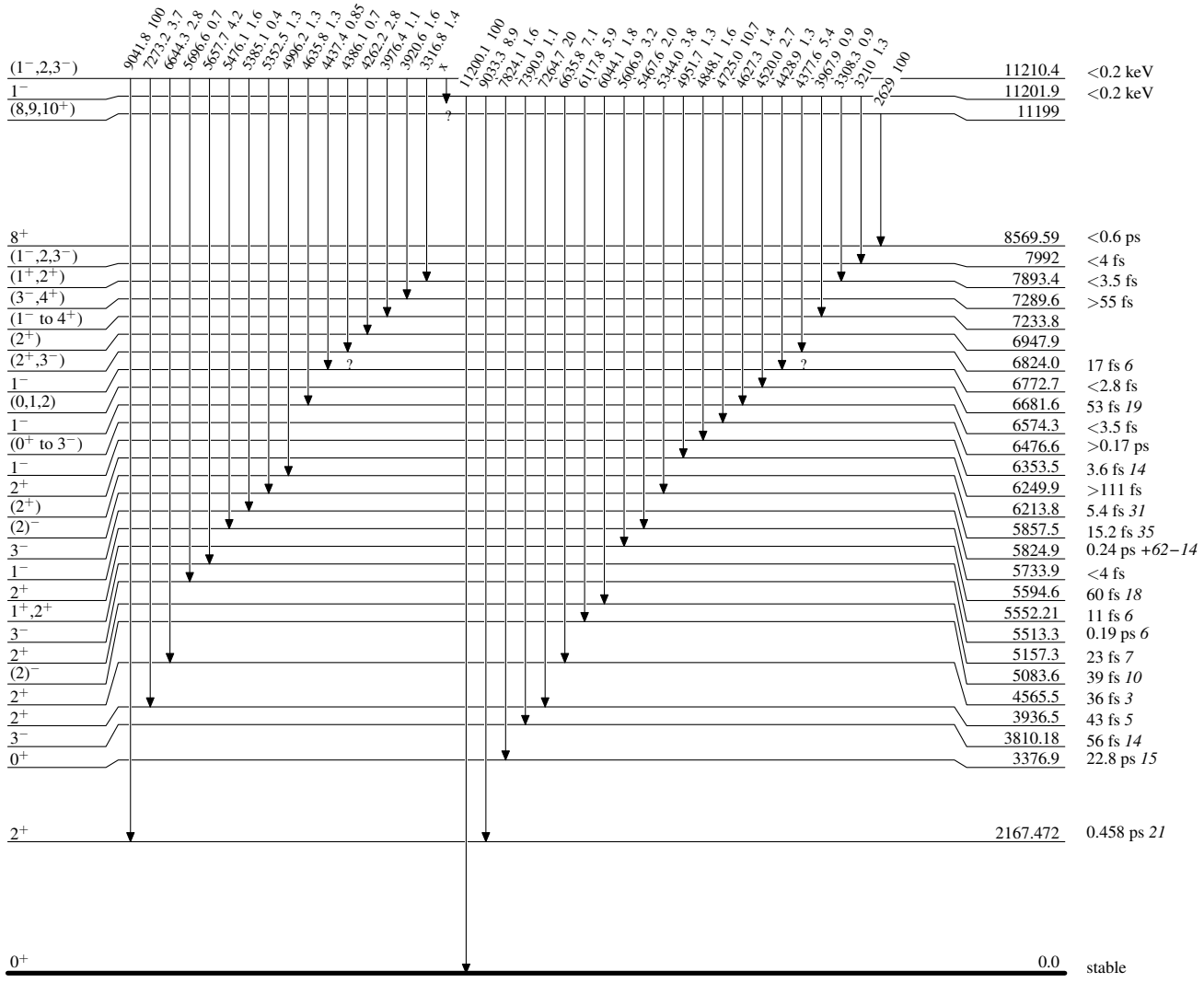


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

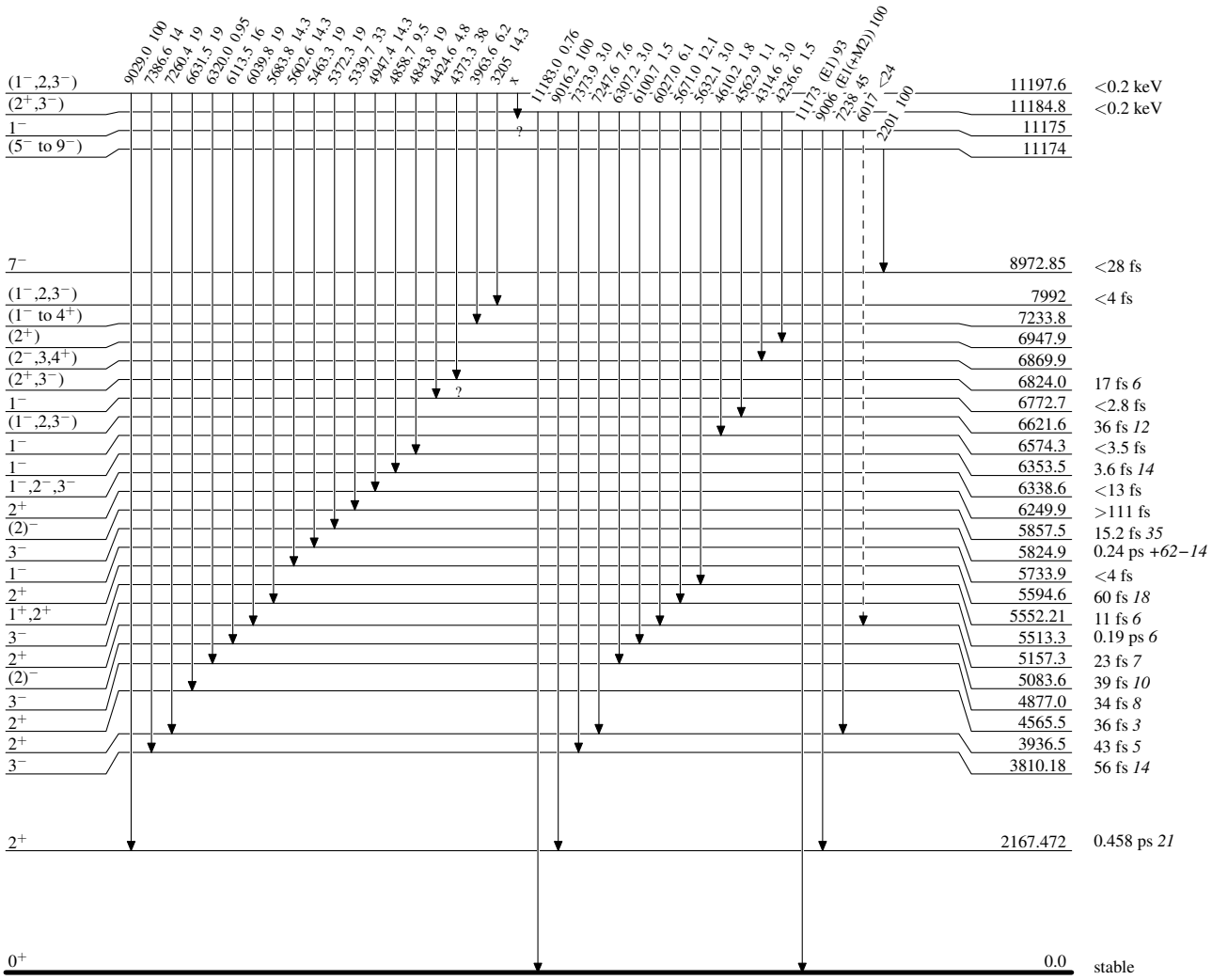
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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

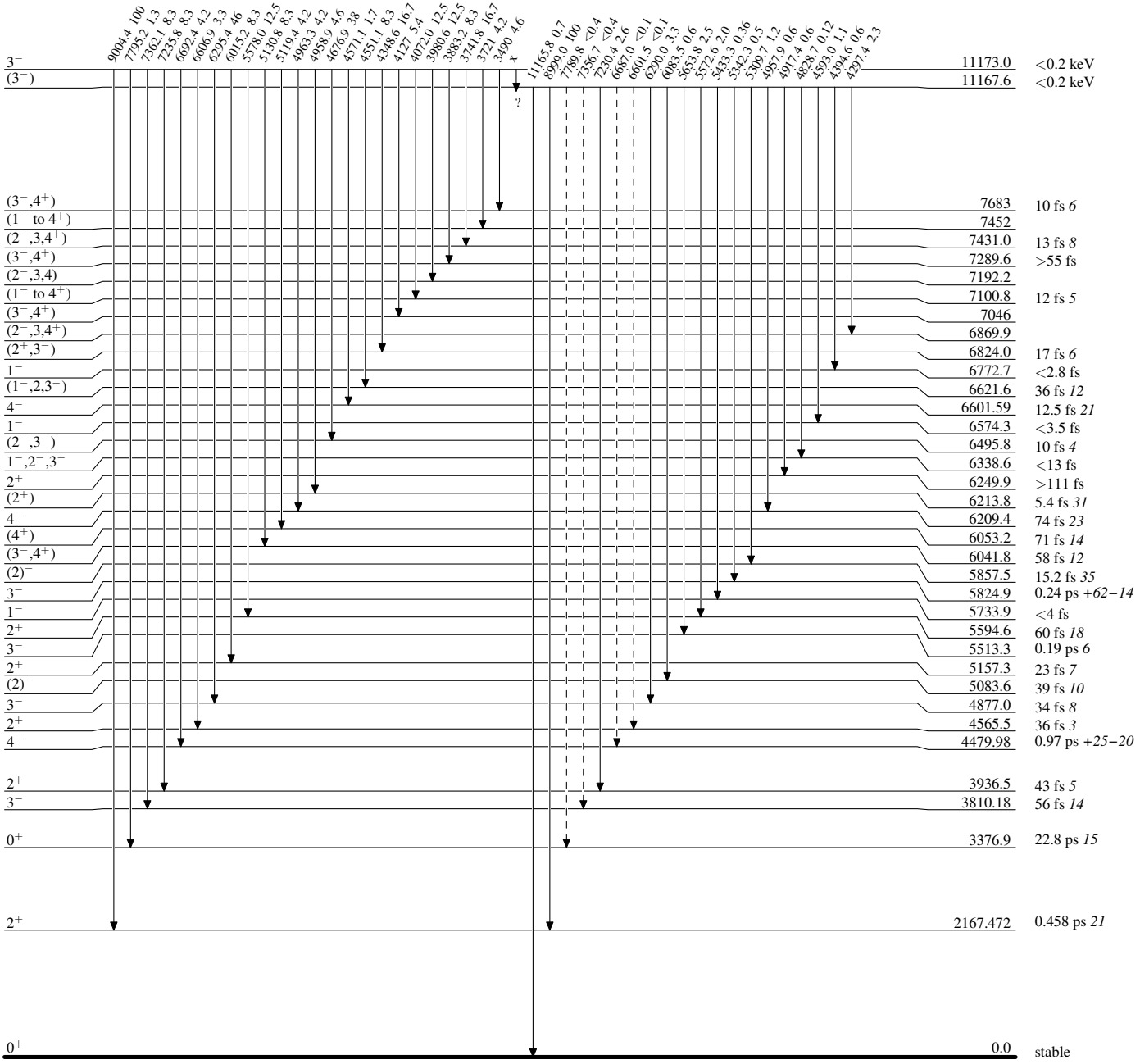
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

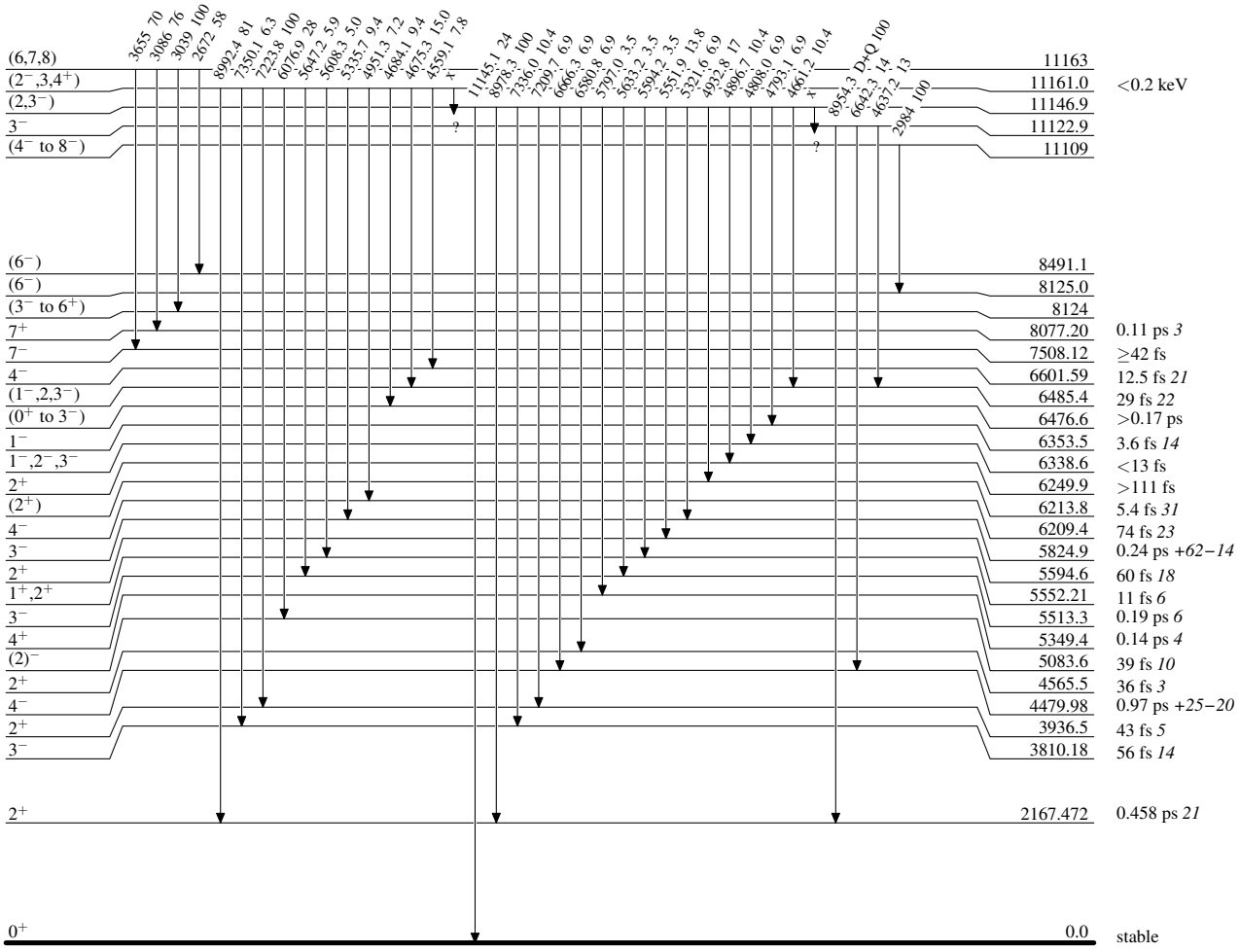


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

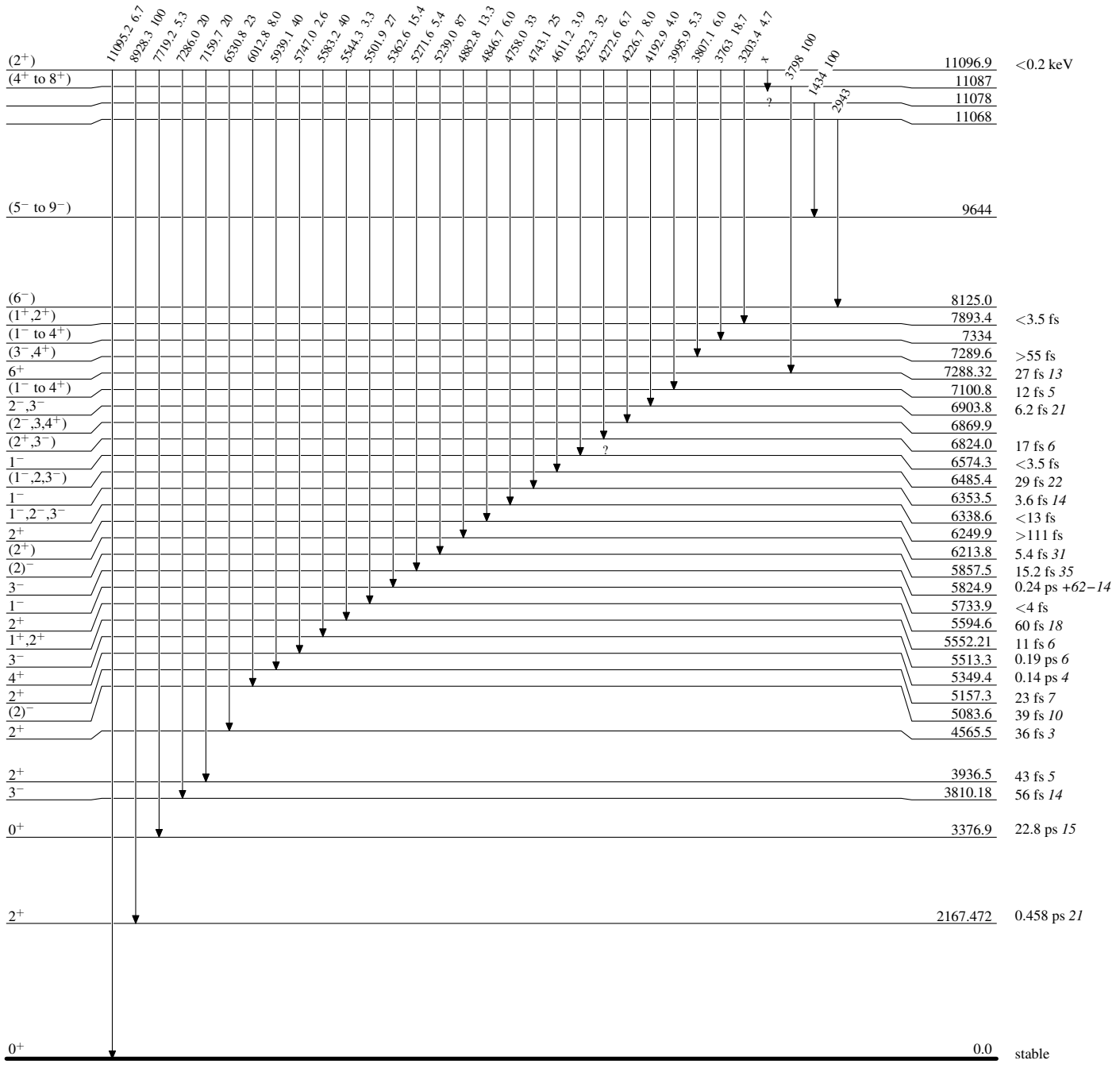
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

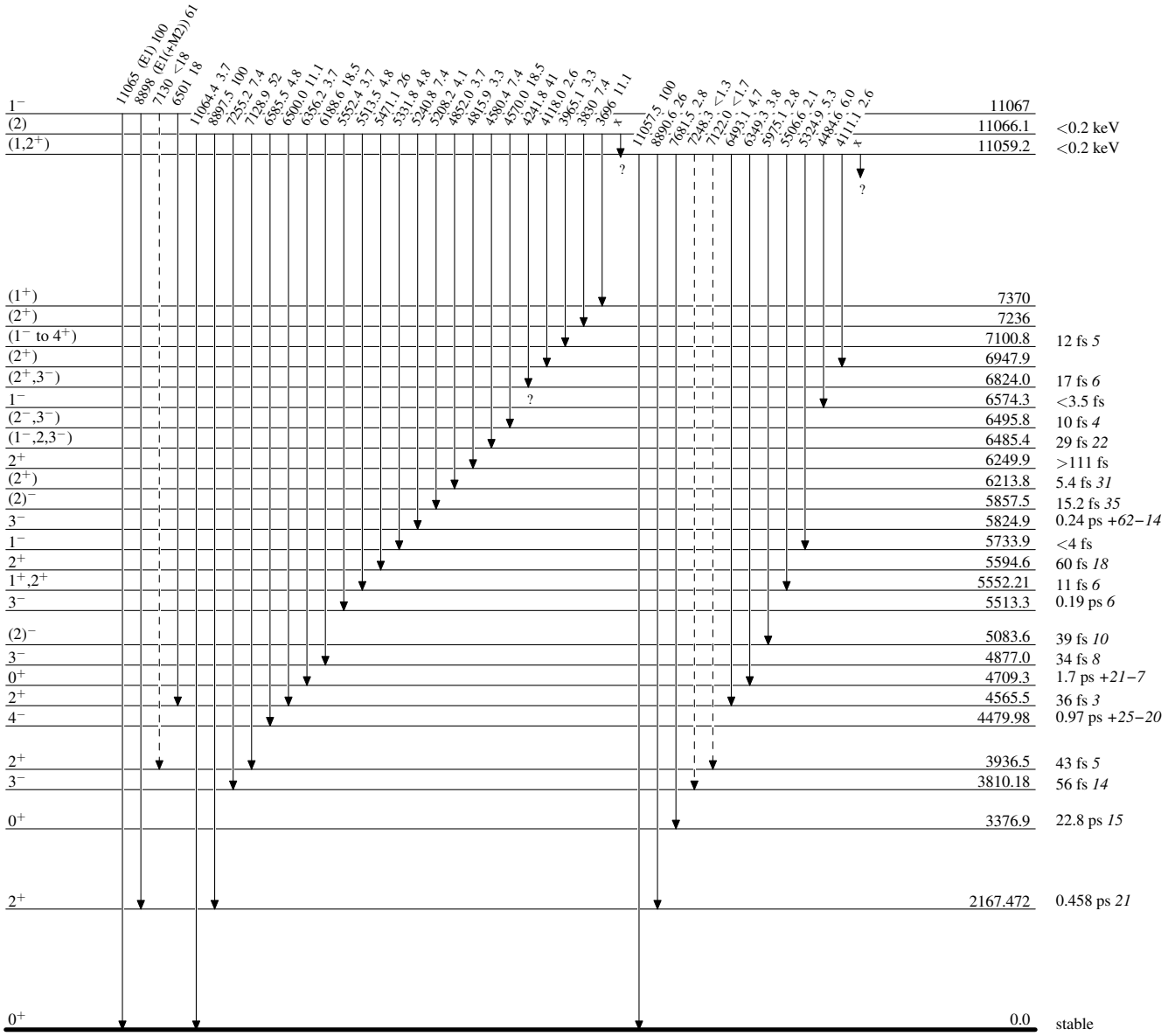
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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

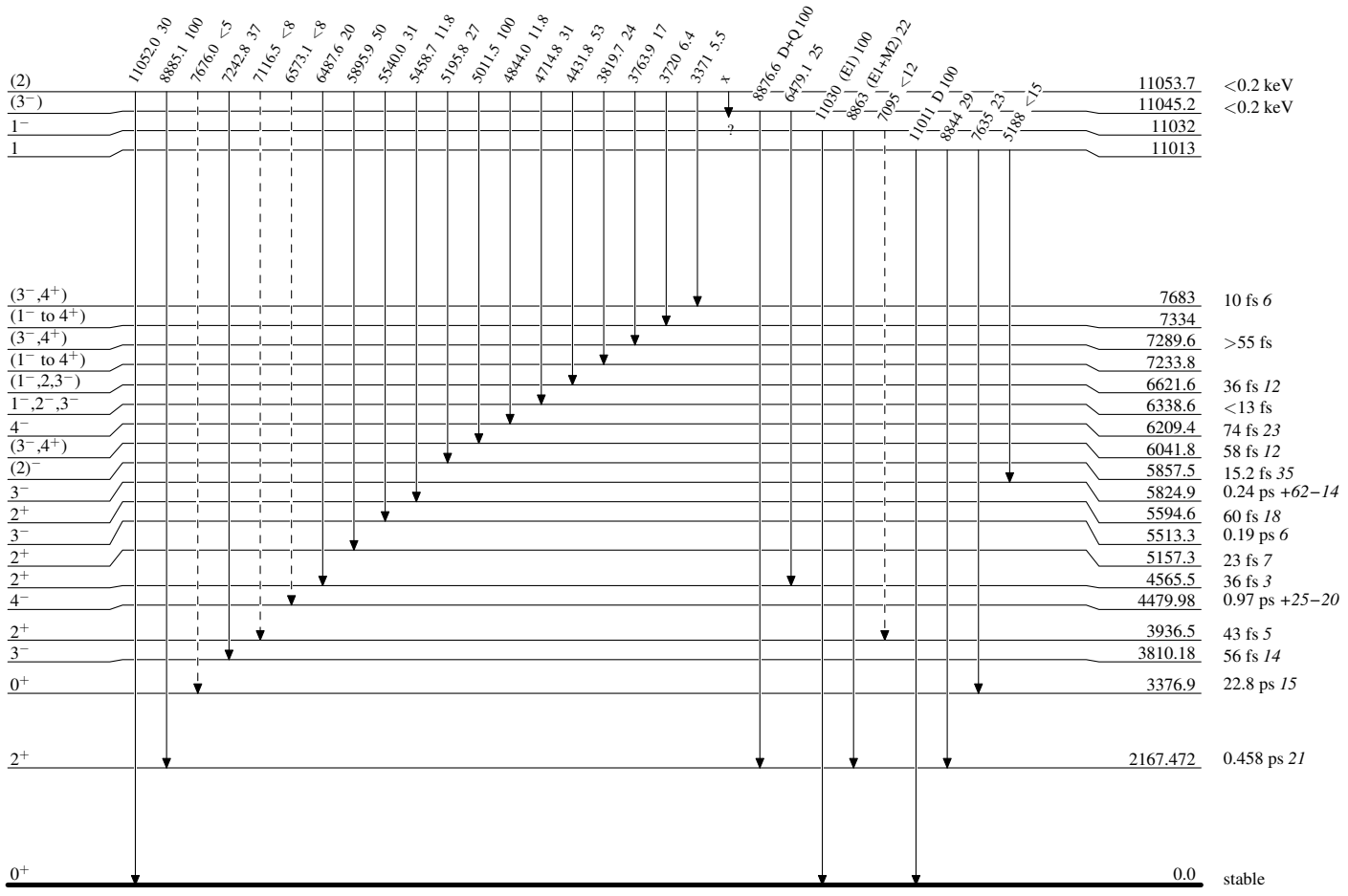
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

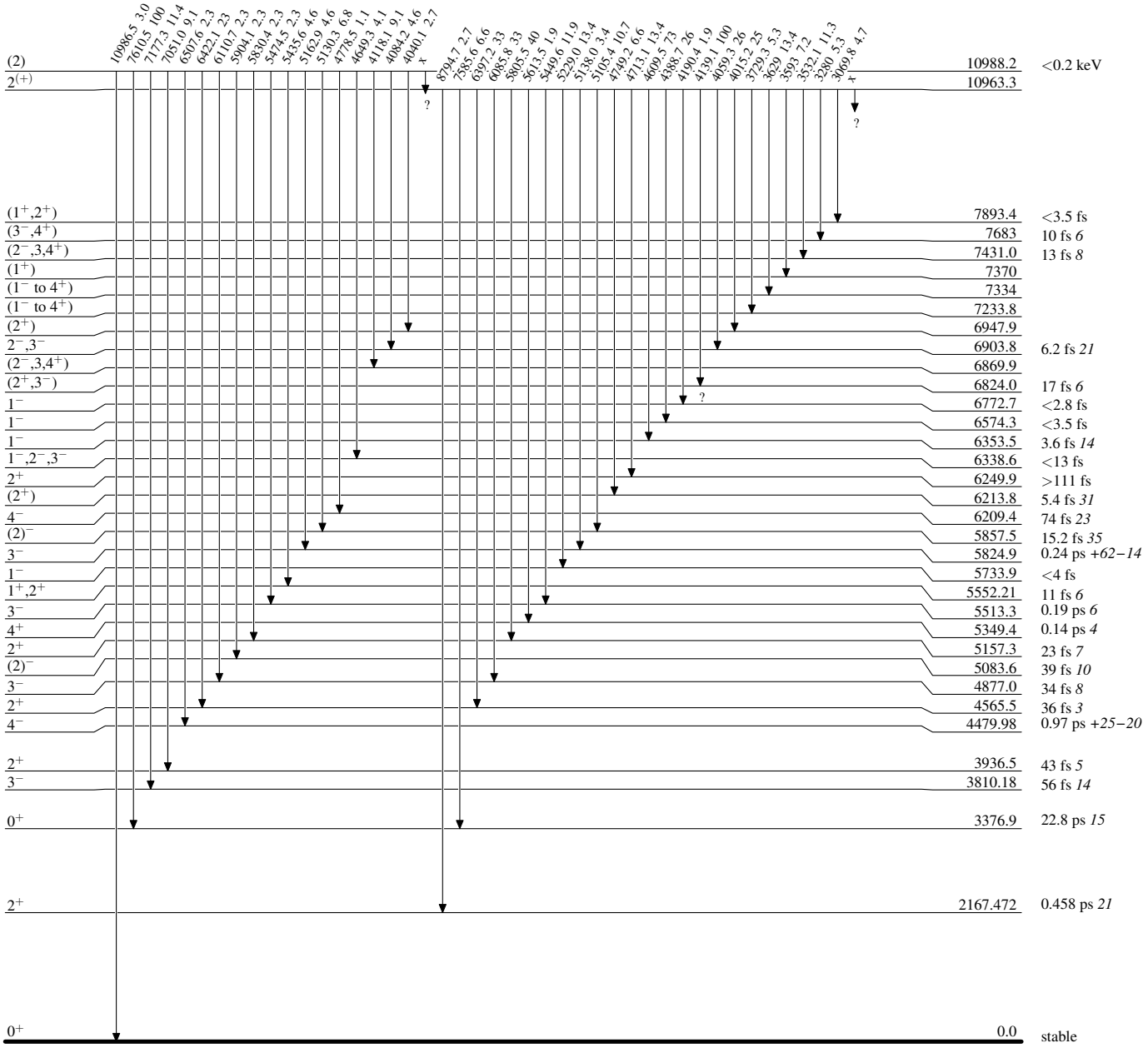


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

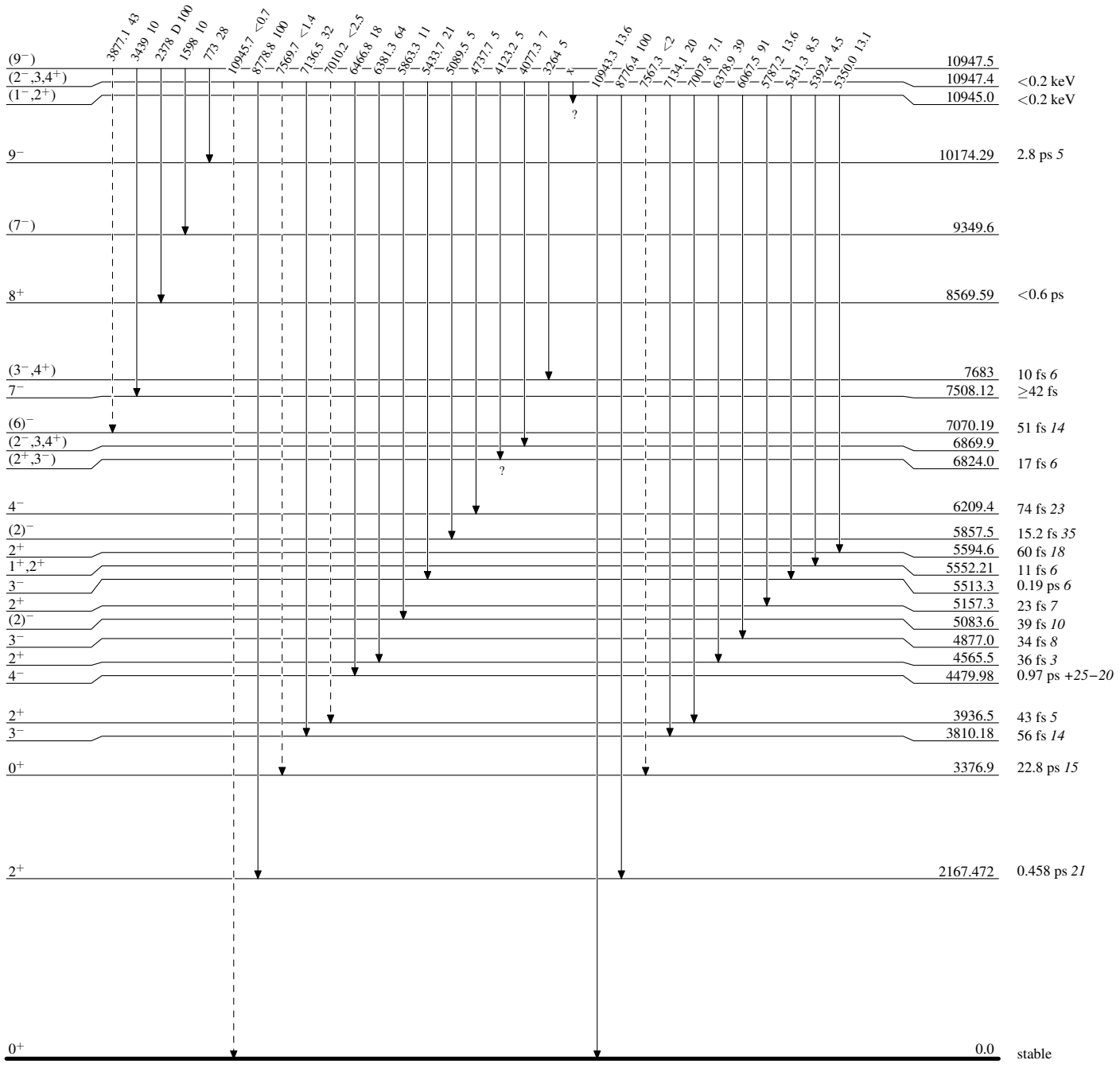
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



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

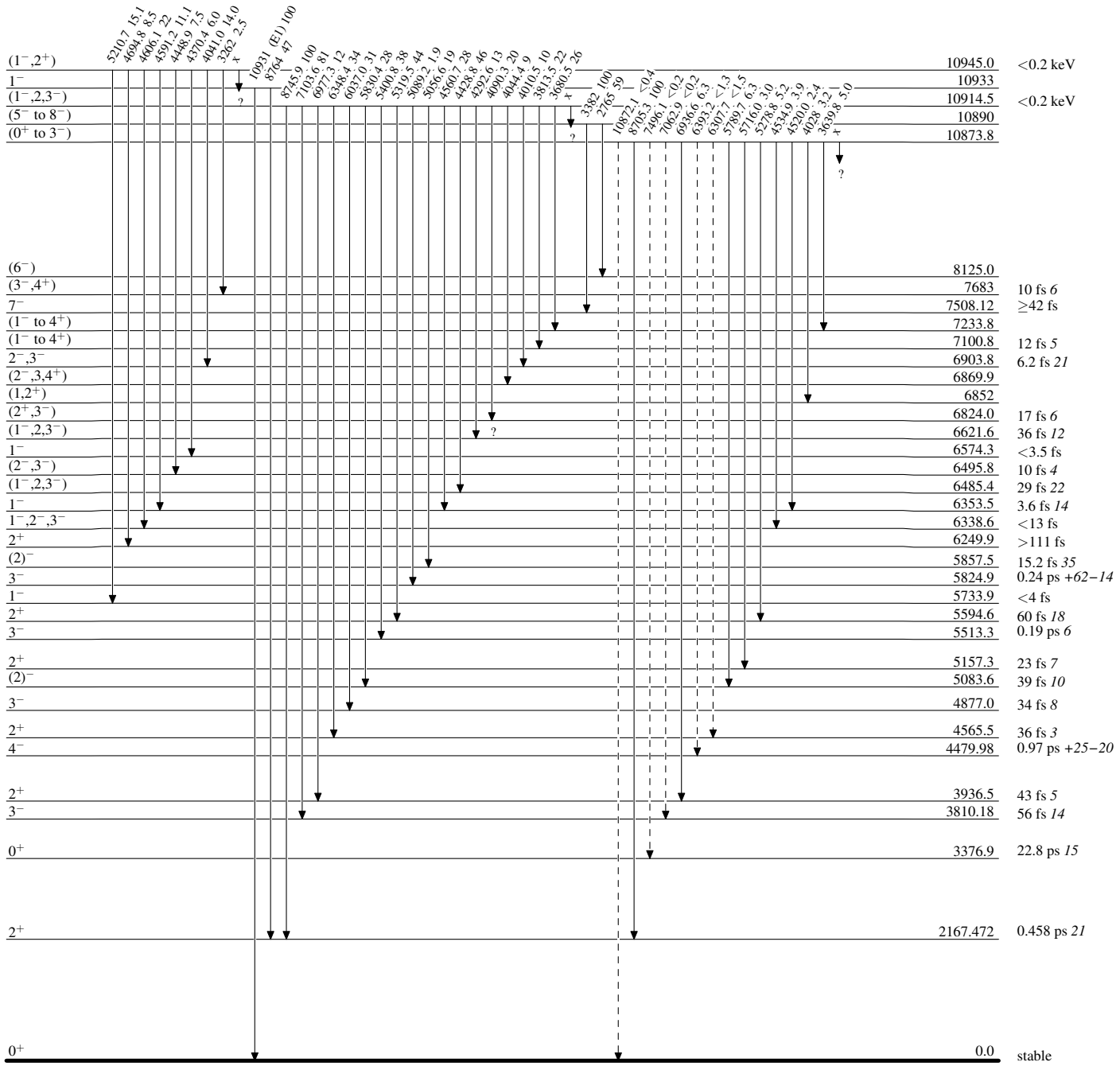
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



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

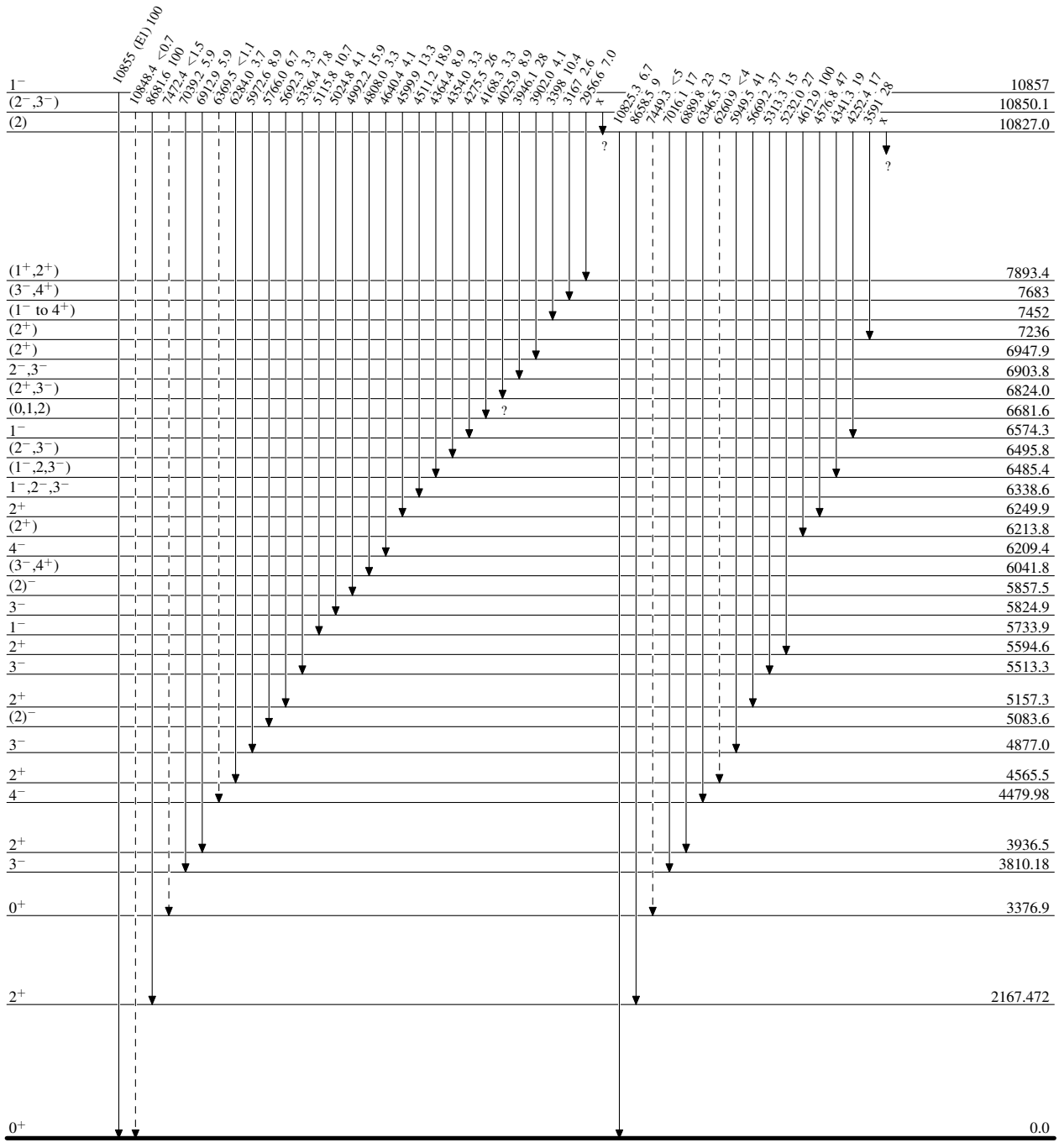
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



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

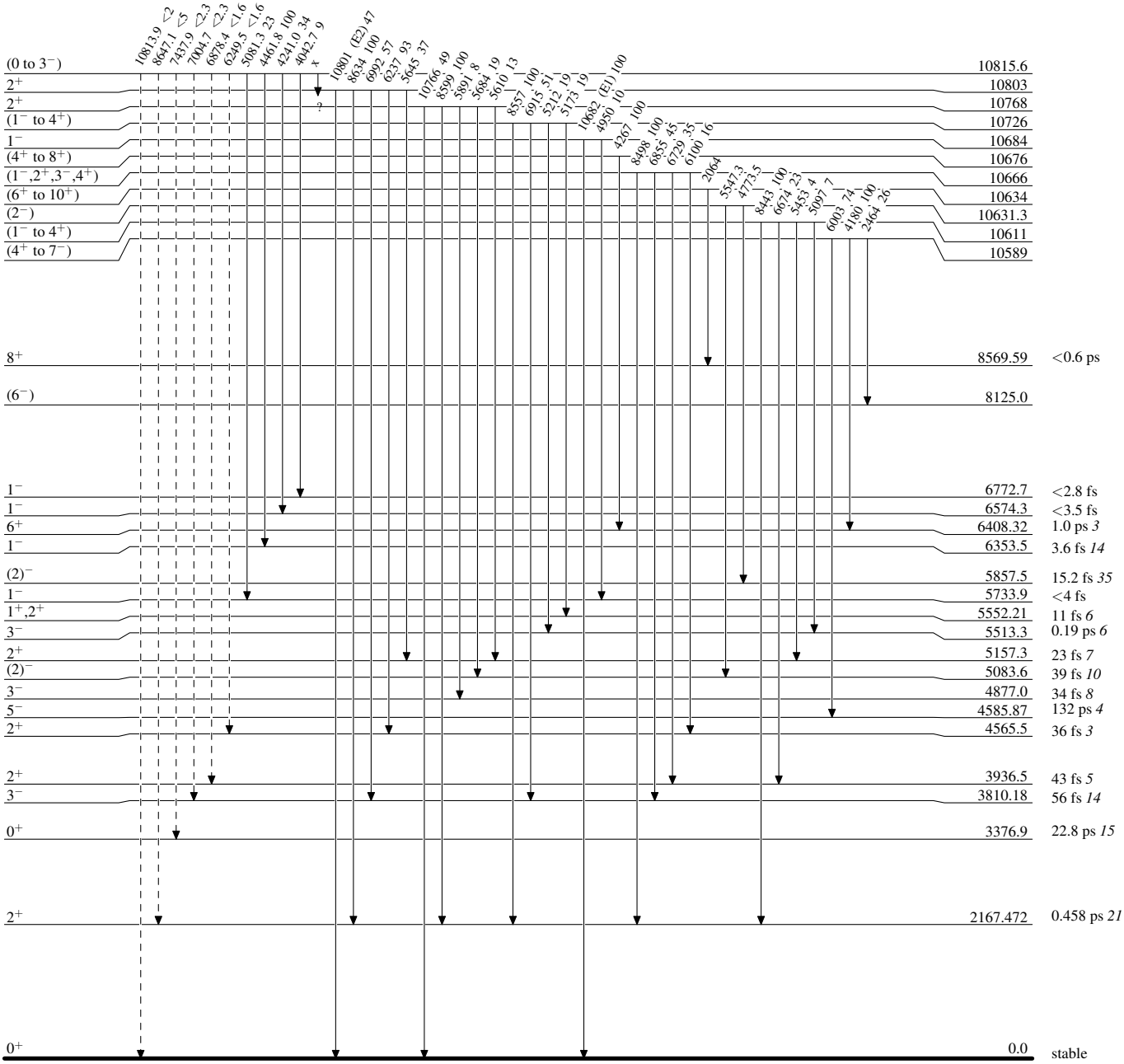
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



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

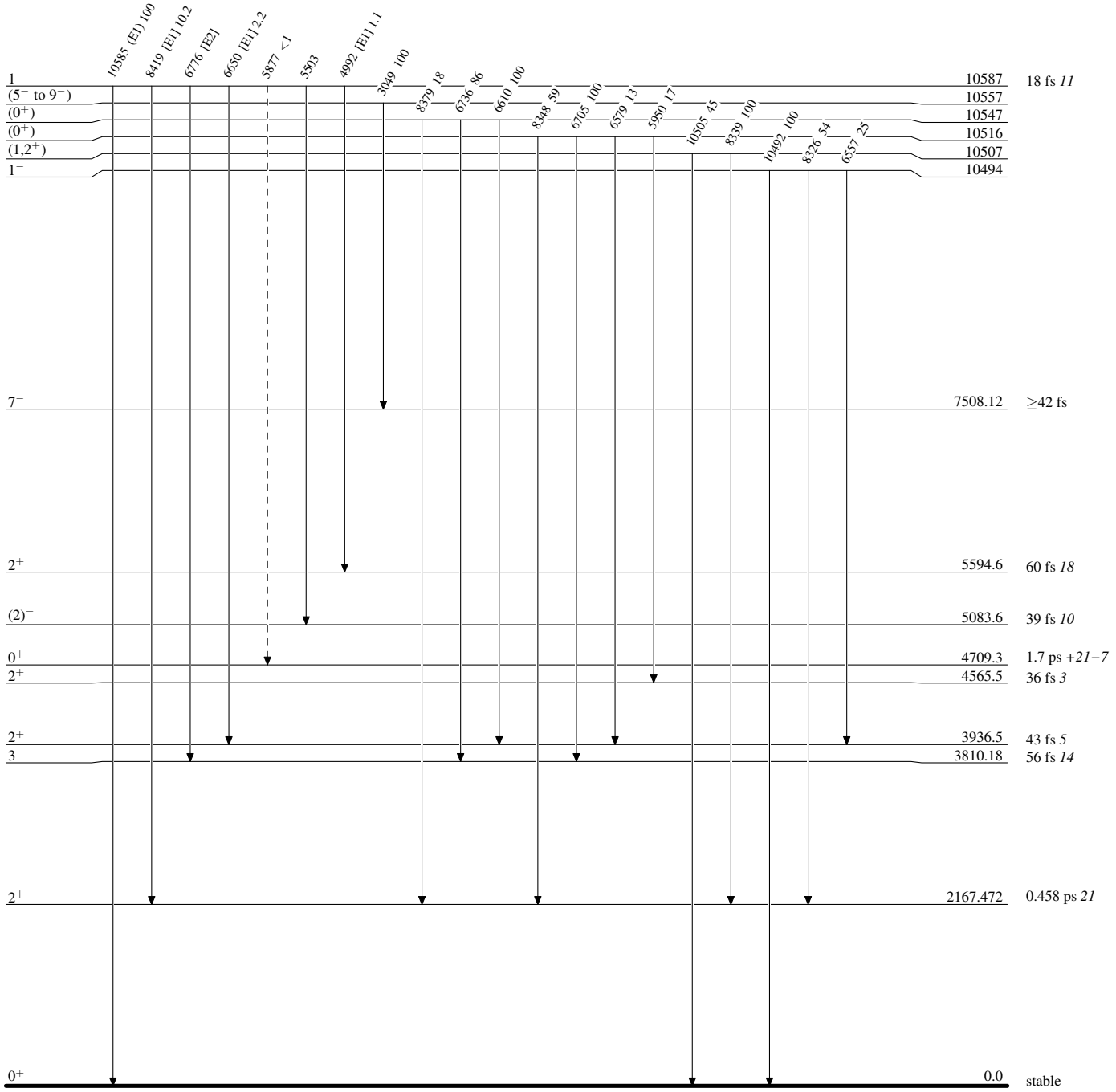
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



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

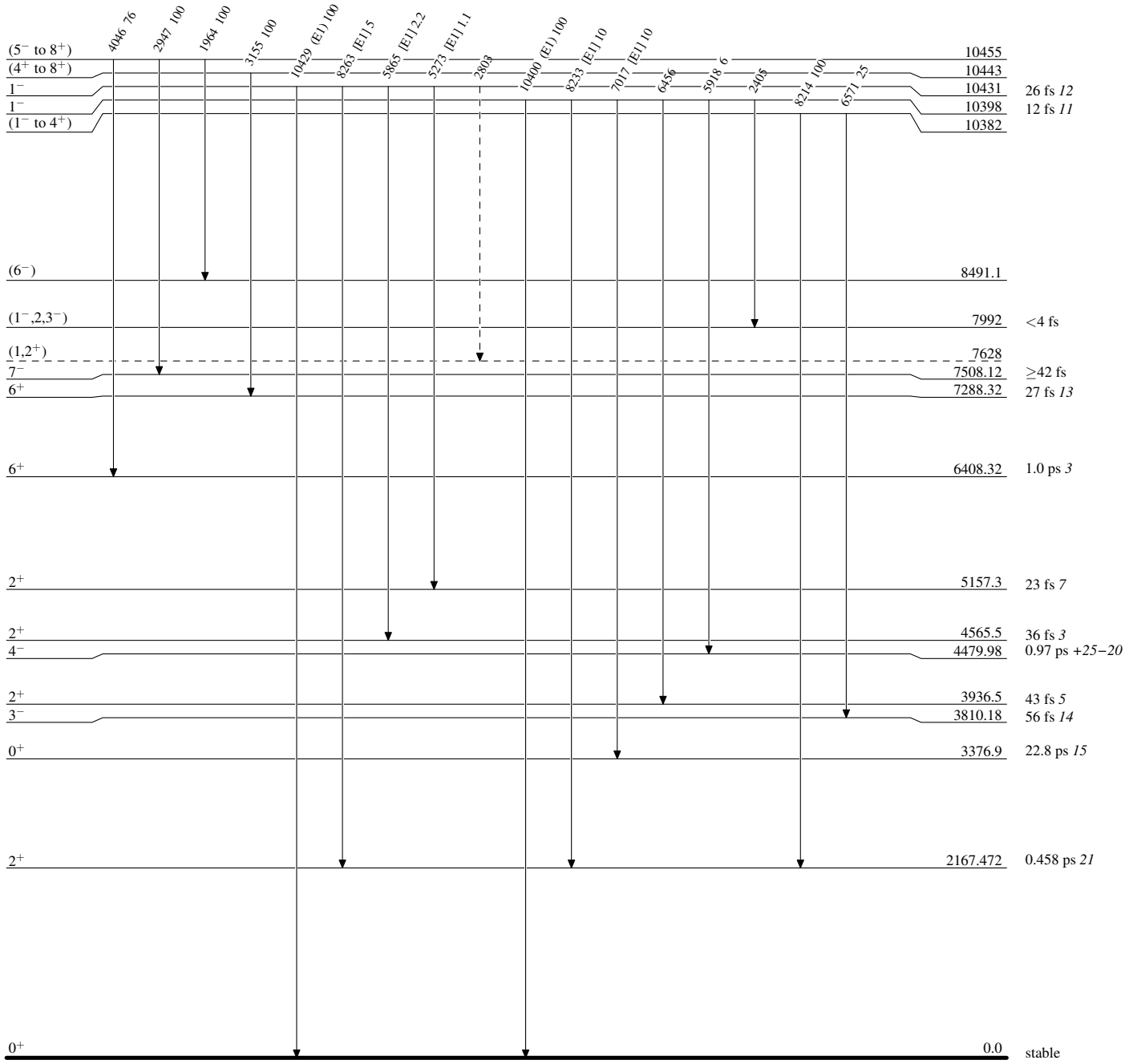
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

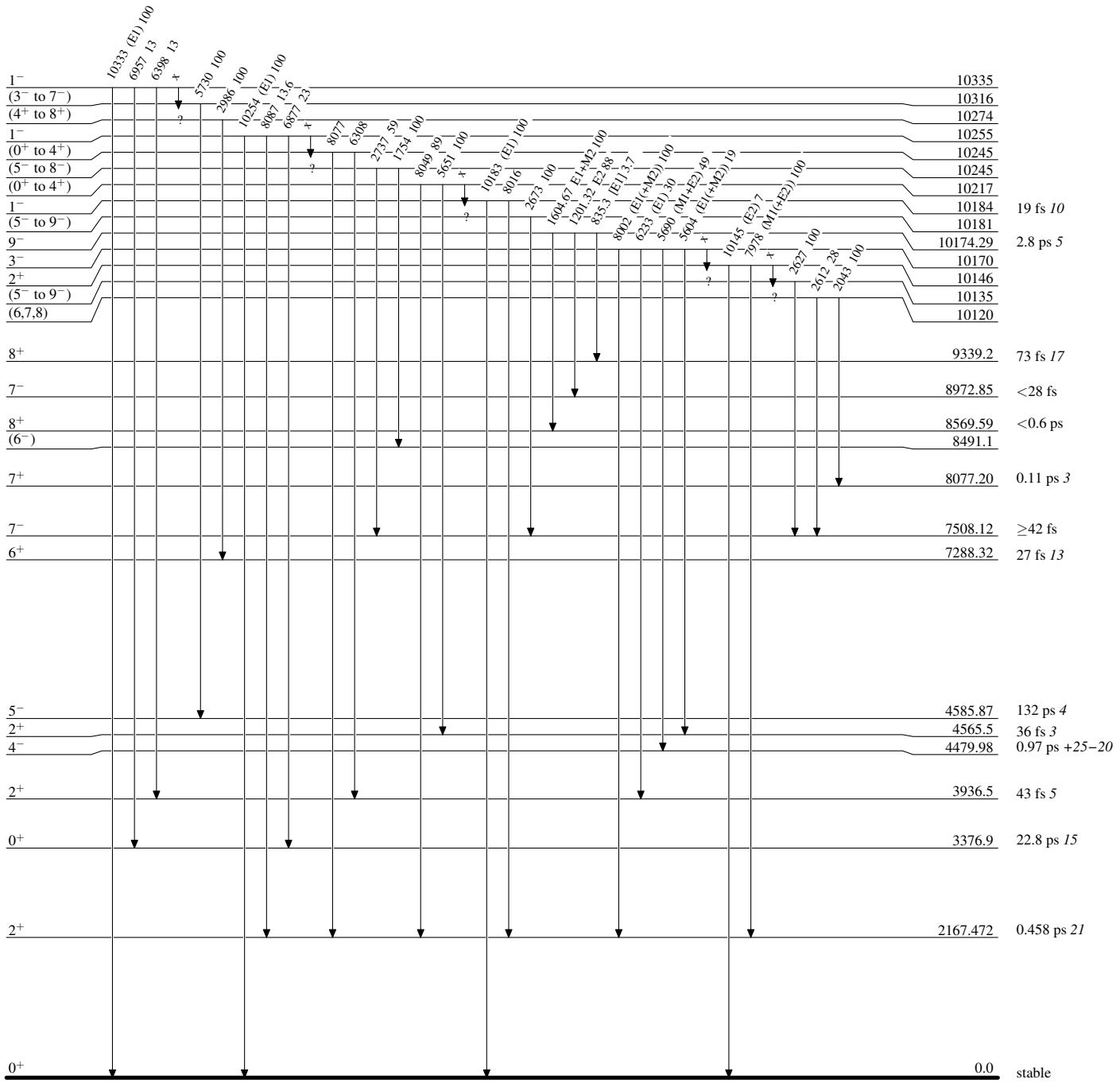


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

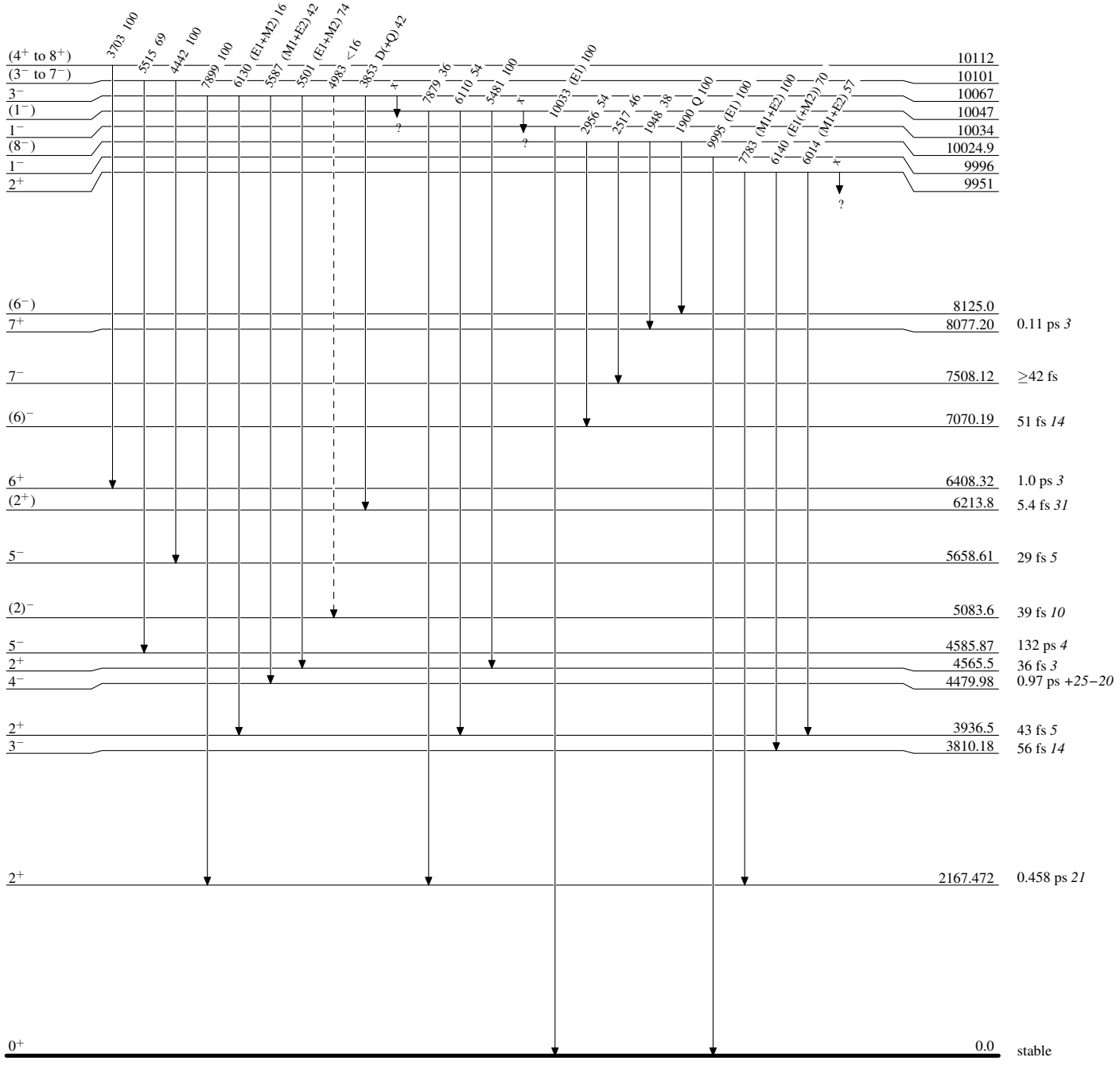
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

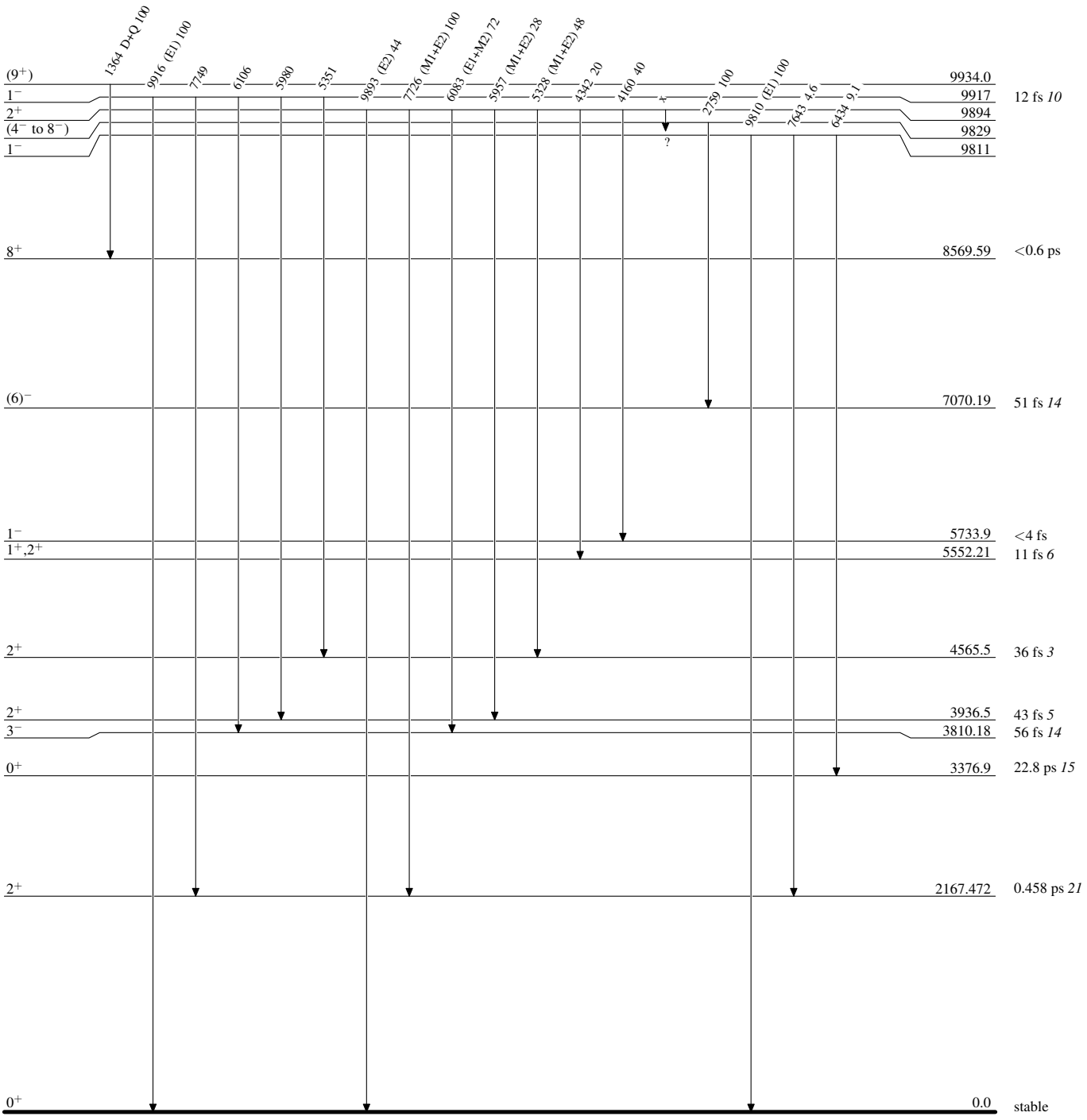


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

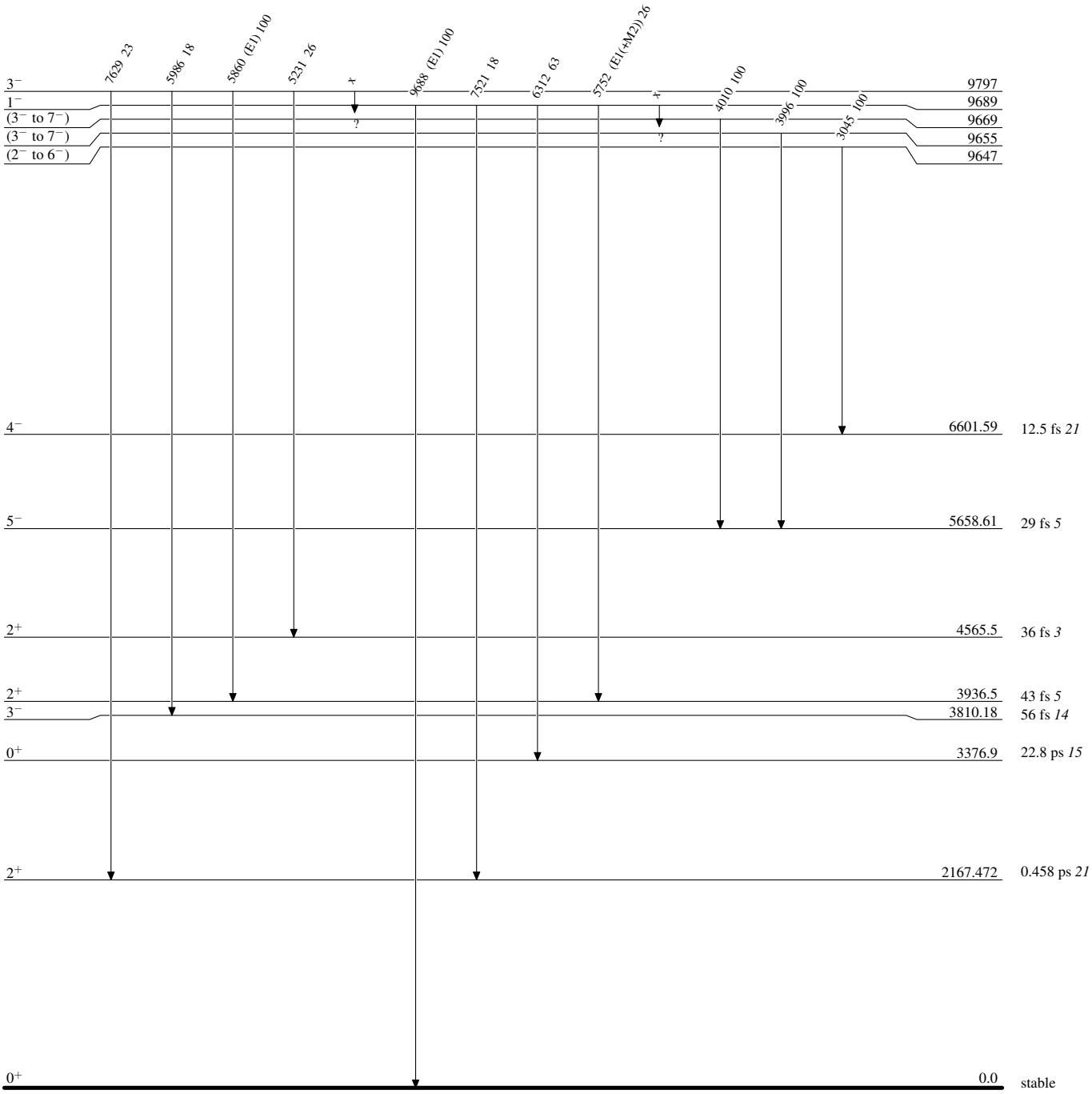


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

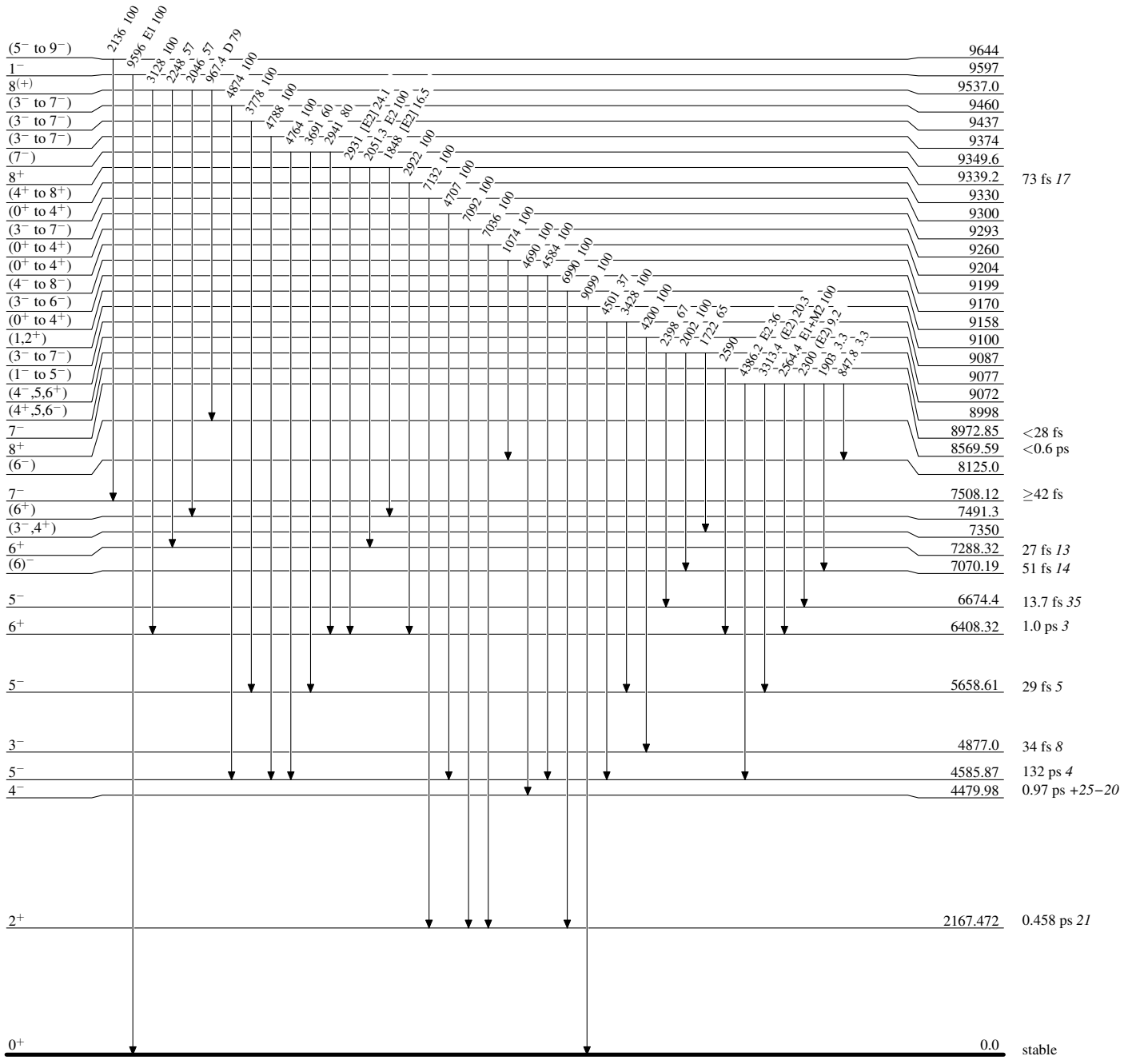


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

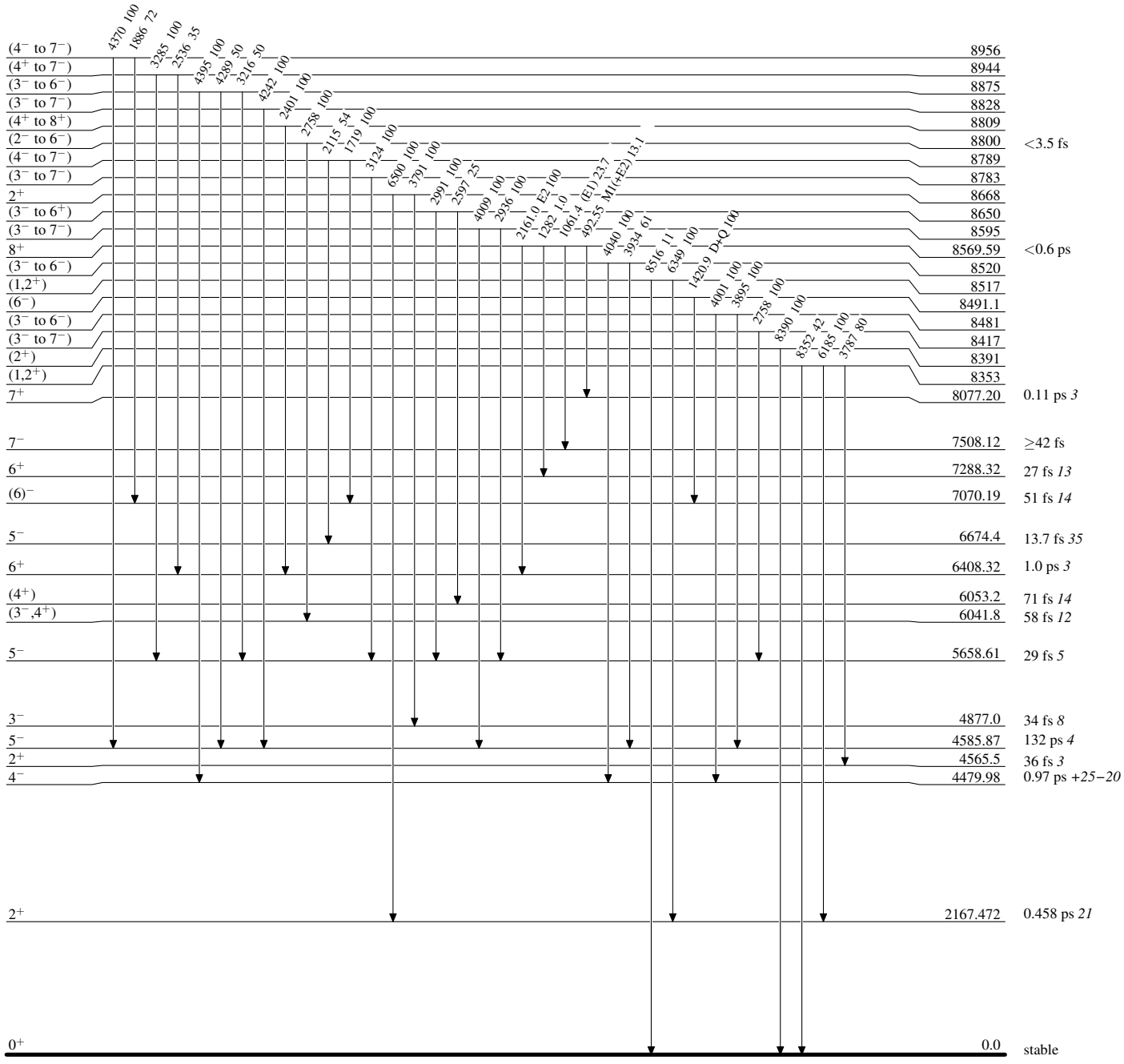


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

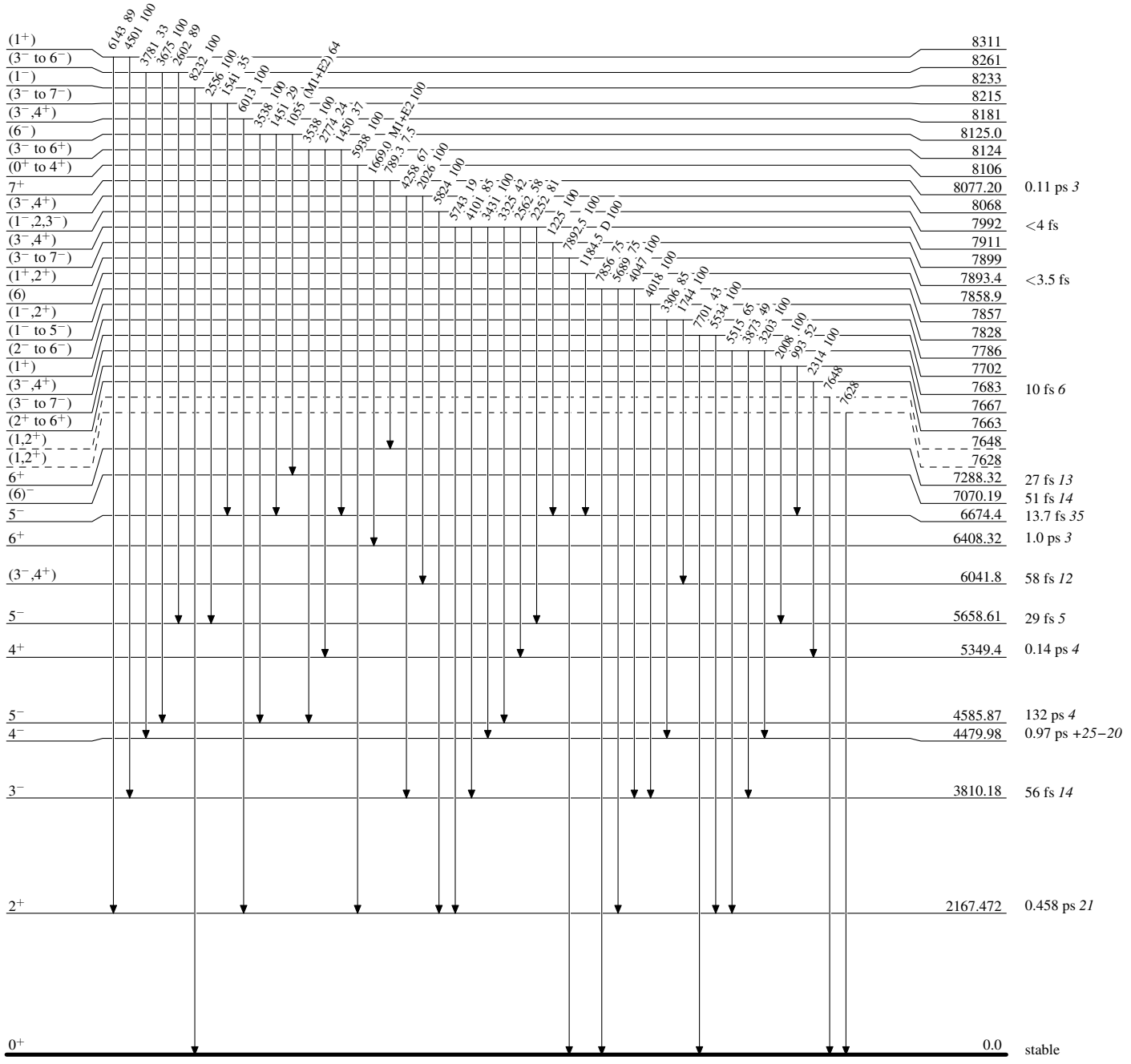


$^{38}_{18}Ar_{20}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

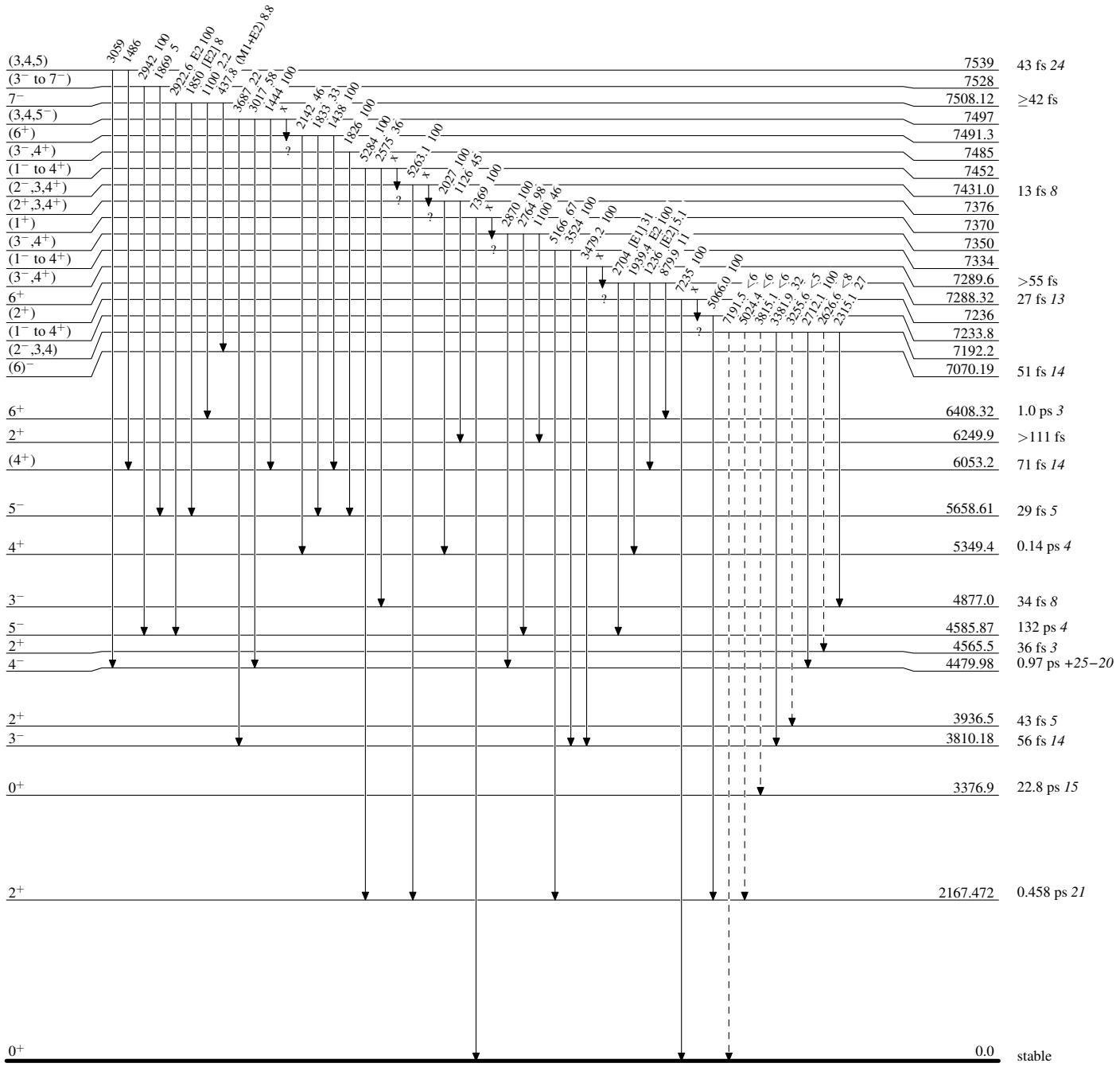
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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

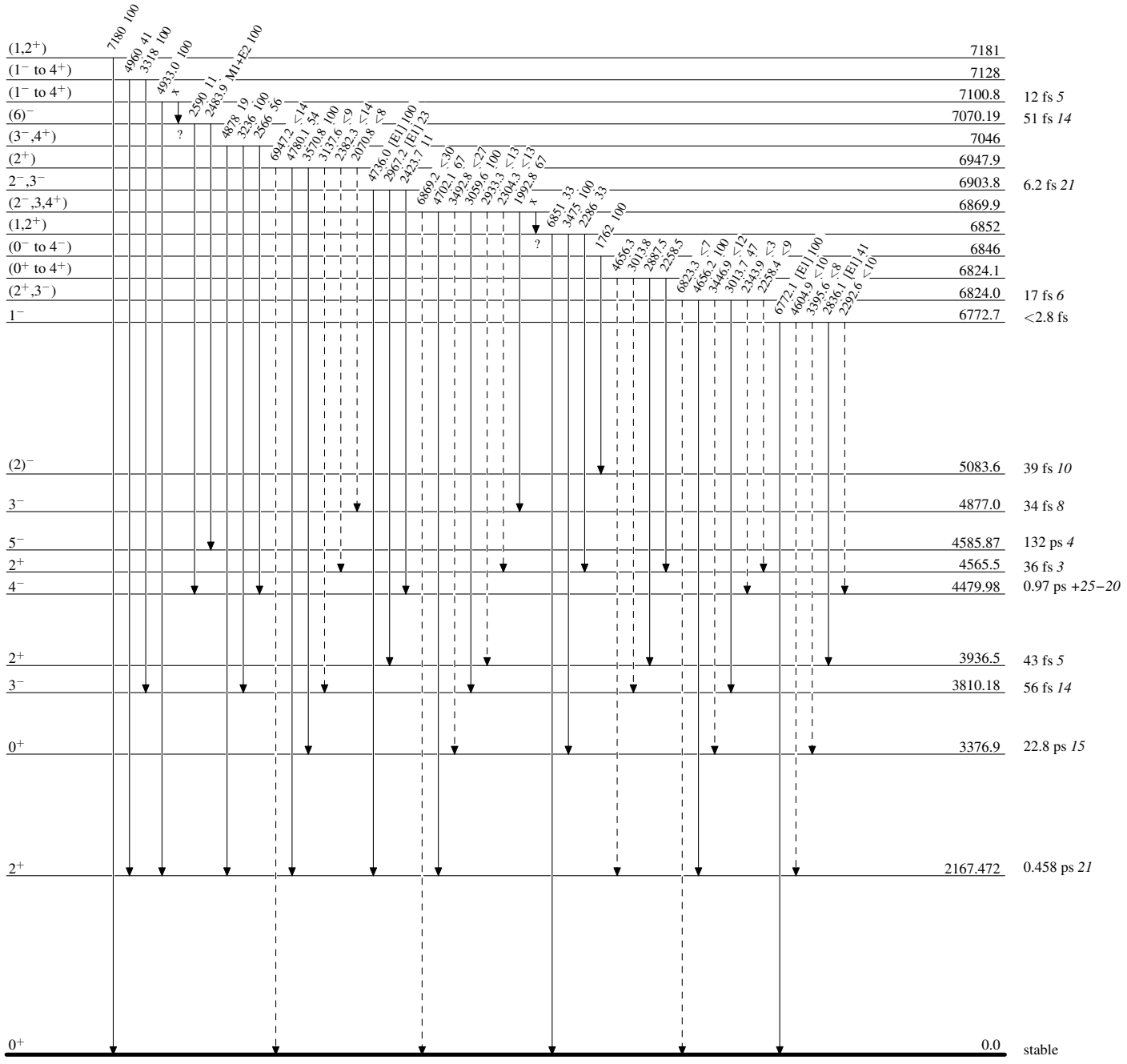
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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

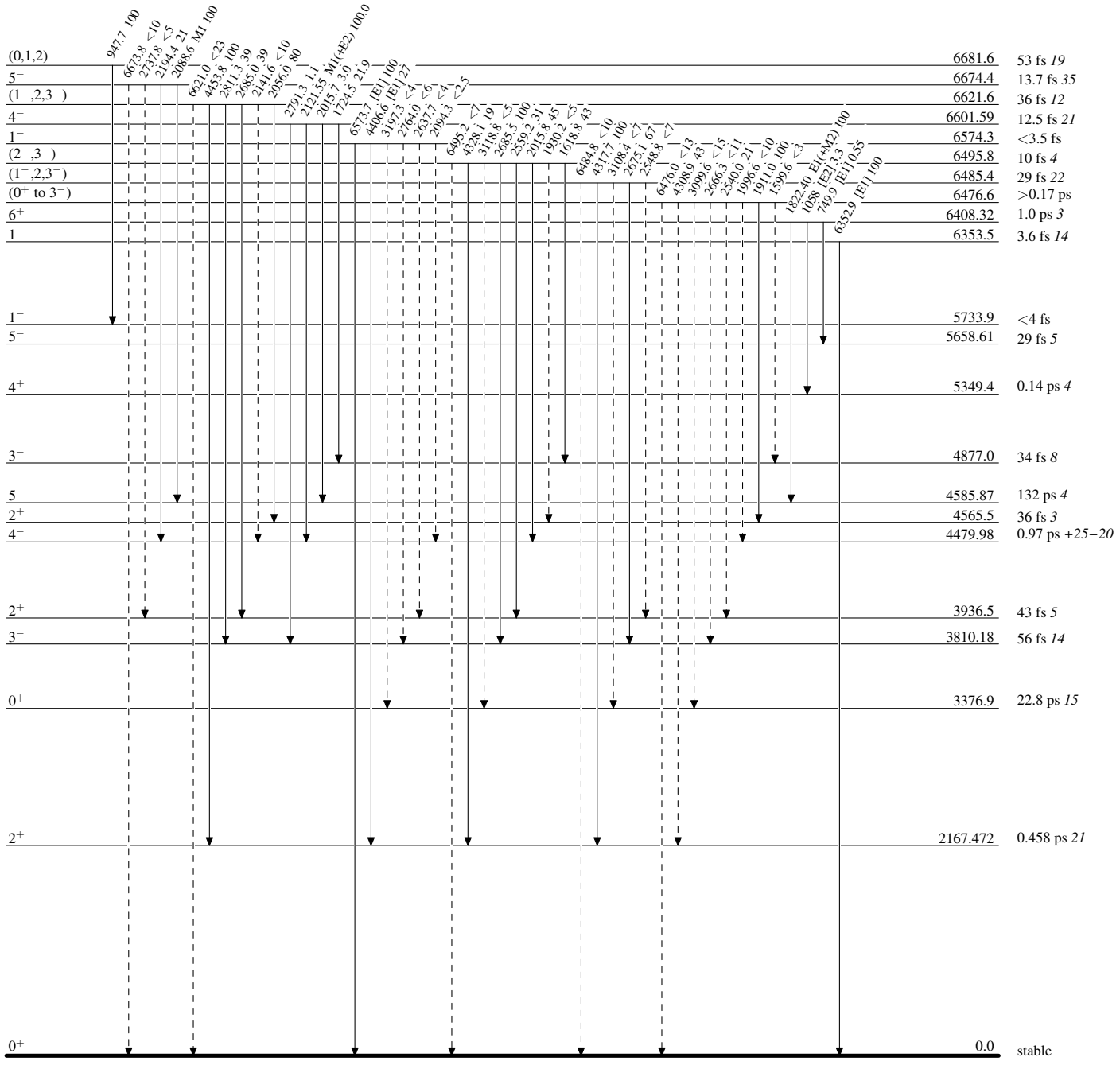
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



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

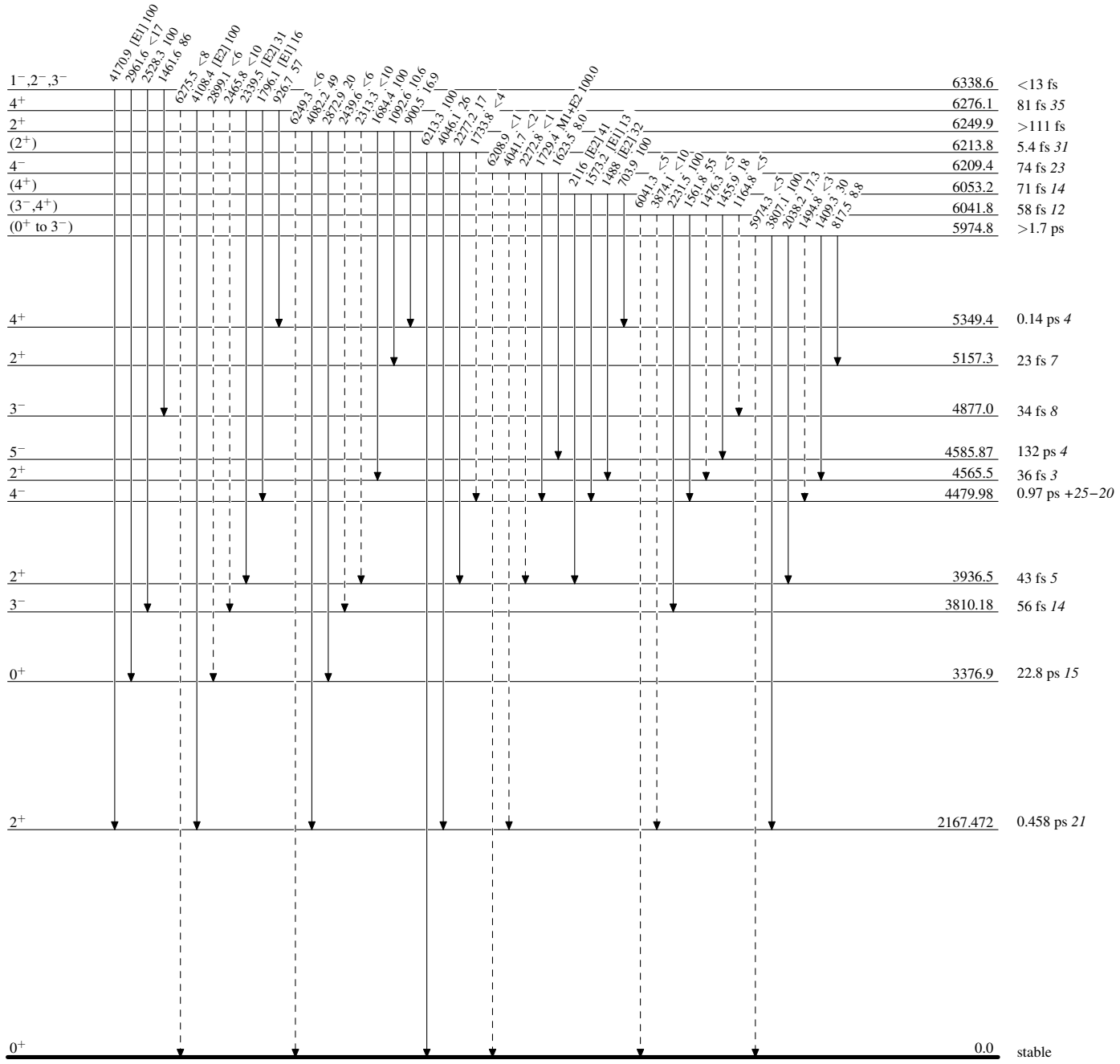
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



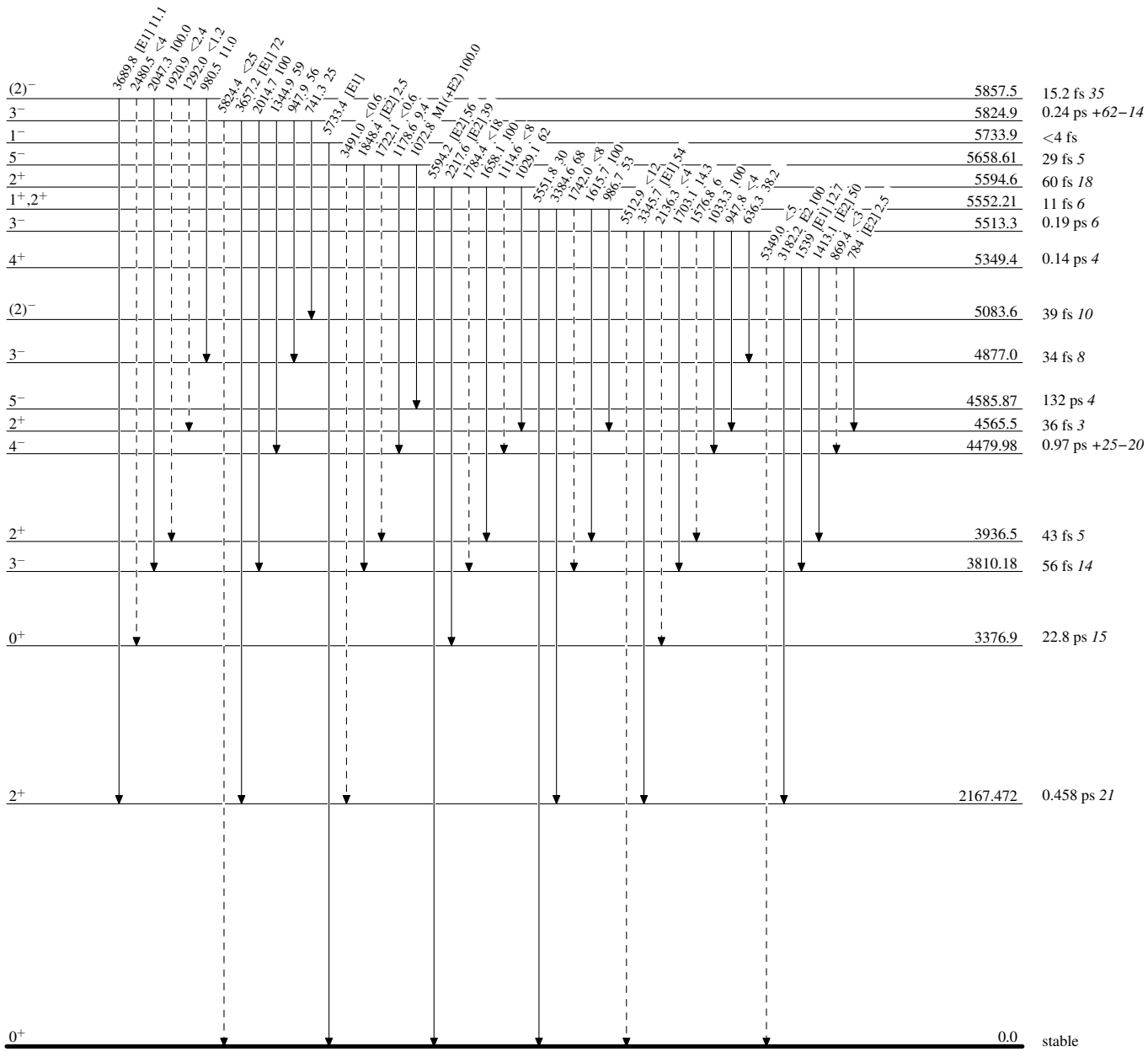
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



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

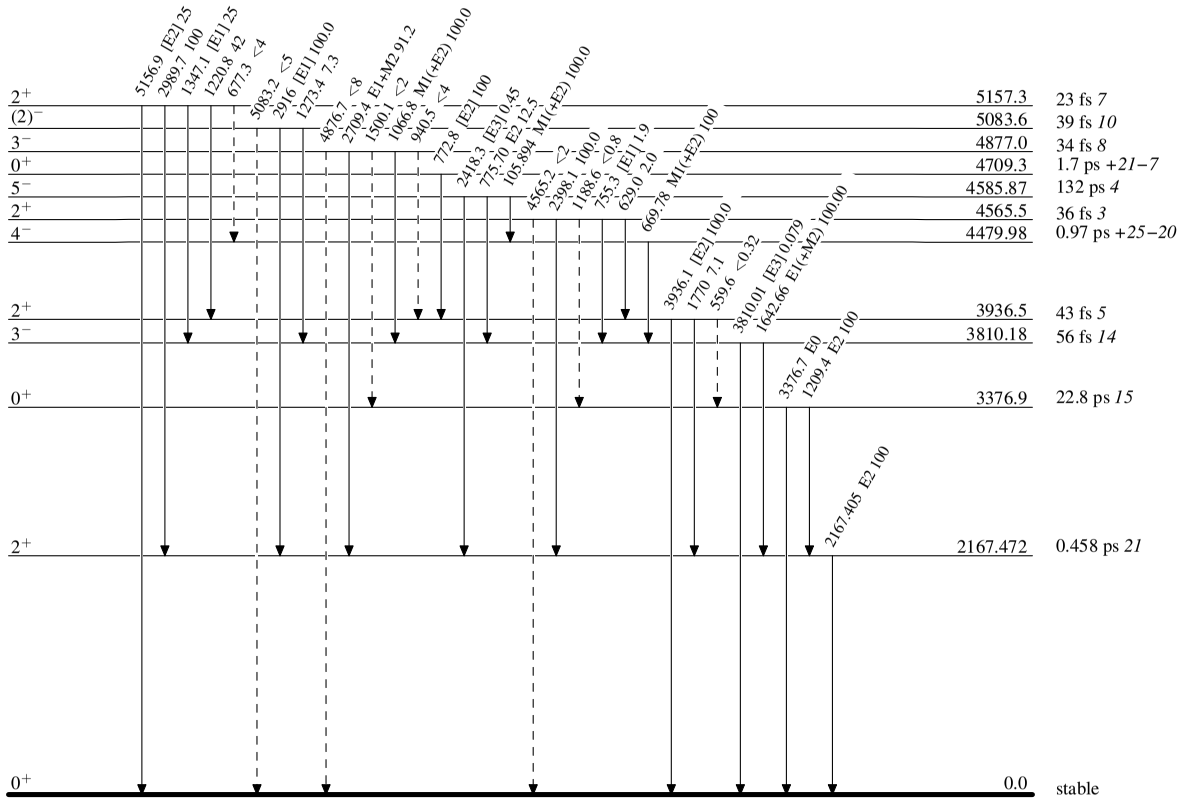
Adopted Levels, Gammas

Legend

Level Scheme (continued)

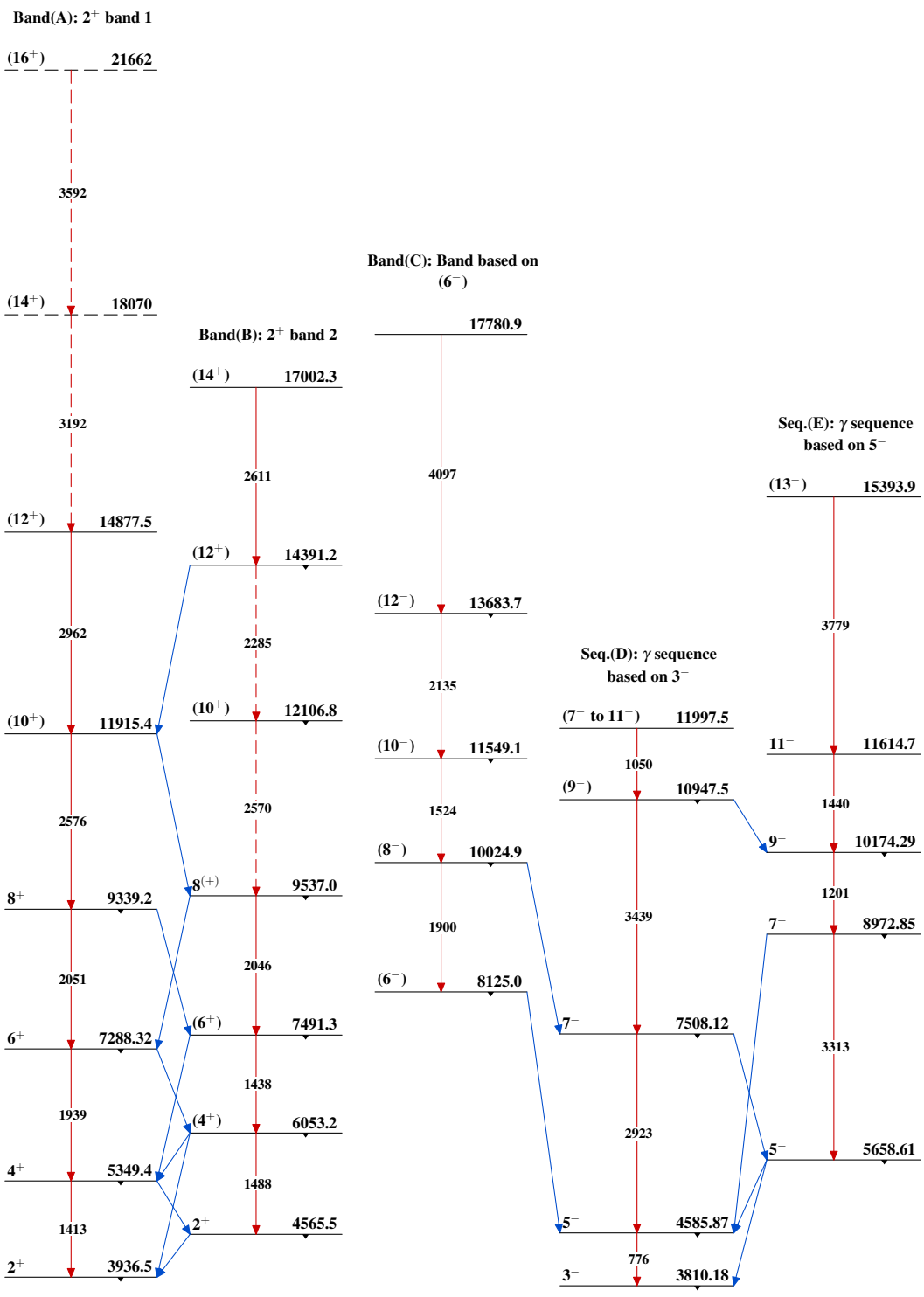
Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



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

Adopted Levels, Gammas



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

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 140,1 (2017)	30-Sep-2015

Q(β^-)=−1504.40 *6*; S(n)=9869 *5*; S(p)=12528.7 *17*; Q(α)=−6800.69 *19* 2012Wa38
S(2n)=16467.71 *19*, S(2p)=22757 *7* (2012Wa38).
First identification of ^{40}Ar nuclide by 1919As01 (later in 1921As01) in a mass spectrometer (2012Th10).
Other reactions:
2012Zh06: ^{9}Be(^{40}Ar,X), 181Ta(^{40}Ar,X) E=57 MeV/nucleon. Measured fragment yields.
2006LiZX: ^{9}Be(^{38}S,X) E=5.45 MeV/nucleon. Measured Eγ, Iγ.
1999Ma14: ^{40}Ar(μ-,X) E=125 MeV. Measured capture rates.
1996Ri19,1996Ri09: ^{40}Ar(^{16}O,^{16}O′) E=250 MeV/nucleon. Deduced structure near isovector dipole and isoscalar quadrupole giant resonances.
1994An39: ^{36}S(α,α). Resonances were observed at Eα=13320 (J^π=7$^-$) and Eα=14120 (J^π=8$^+$).
1992Wa11,1991Mo05: ^{40}Ca(π-,π+) E=295 MeV. Deduced double isovector giant−dipole resonance at 31.1 MeV with a width of 90 MeV.
1990Va11: ^{40}Ar(X,X) E=5.9 keV. Measured E(x-ray).
1989Al15: ^{40}Ar(^{32}S,^{32}S) E=100 MeV. Measured $\sigma(\theta)$. 1989Gr06: E=180, 240 MeV; 1979Da16: E=290 MeV.
1986Ge01,1985Ge04: ^{40}Ar(π,π) E=180 MeV. Measured $\sigma(\theta)$.
1985Sh06: ^{40}Ar(^{16}O,^{16}O) E=100 MeV. Measured $\sigma(\theta)$.
1983To18: ^{40}Ca(E,π+) E=400 MeV.
1980KoZI: ^{48}Ca(^{3}He,^{11}Be). Deduced 8-particle transfer and isospin=4 isotopic multiplet.
Muonic x ray: 2p$_{3/2}$ to 1s$_{1/2}$: 643.674 keV *20* (1981Fr25, 1992Fr01), 643.94 keV *11* (1971Bb11,1976Pf01).
Hyperfine structure and isotope shift measurements: 2008BeZH, 2005Bl33, 2003Sa20, 1996Kl04, 1988Mo30, 1986Mu06, 1982Ei01.
Mass measurement: 2005Go36, 2003Fr08, 2002Bf02, 2001Wa50, 1998Ca53, 1997Br44, 1995Ya15, 1995Di08, 1968Sc01, 1968Fu11.

^{40}Ar Levels

Cross Reference (XREF) Flags

A	^{40}Cl β^- decay (1.35 min)	I	^{38}Ar(α,^{2}He)	Q	^{40}Ar(α,α'),(α,α)
B	^{40}K ε decay (1.248×10^9 y)	J	^{40}Ar(γ,γ'),(pol γ,γ')	R	Coulomb excitation
C	^{12}C(^{36}S,2$\alpha\gamma$)	K	^{40}Ar(e,e′),(e,e)	S	^{40}Ca(^{14}C,^{14}O)
D	^{26}Mg(^{16}O,2pγ),^{27}Al(^{18}O,p$\alpha\gamma$)	L	^{40}Ar(n,n′γ),(n,n)	T	^{41}K(d,^{3}He)
E	^{26}Mg(^{18}O,2p2nγ)	M	^{40}Ar(p,p′γ)	U	^{42}Ca(^{14}C,^{16}O)
F	^{36}S(α,γ):resonances	N	^{40}Ar(p,p′),(pol p,p′)	V	^{44}Ca(^{3}He,^{7}Be)
G	^{37}Cl(α,pγ)	O	^{40}Ar(pol d,d′),(d,d′)	W	^{44}Ca(α,2α)
H	^{38}Ar(t,p)	P	^{40}Ar(^{3}He,^{3}He′),(^{3}He,^{3}He)	X	^{208}Pb(^{40}Ar,Xγ)

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[@]	XREF	Comments
0[c]	0$^+$	stable	ABCDEFGHIJKLMNOPQRSTUVWX	J$^\pi$: Optical spectroscopy measurements: 1937Ko03, 1953Me73; no hyperfine structure seen. Evaluated rms charge radius=3.4274 fm *26* (2013An02). Δ<r^2>(^{38}Ar−^{40}Ar)=0.169 fm^2 33 (1996Kl04), 0.17 fm^2 (1986Mu06). charge radius <r^2>$_{1/2}$=3.415 fm *5* (1976Pf01), 3.429 fm *6* (1971Bb11) from Muonic x-ray data; 3.393 fm *15*(stat) (1976Fi12), 3.41 fm *4*, (1971Sc09), 3.47 fm *5* (1971Gr27,1975GrYY), 3.48 fm *4* (1974We02) from ^{40}Ar(e,e′) data.
1460.849[c] *5*	2$^+$	1.15 ps *5*	ABCDEFGHIJKLMNOPQRSTUVWX	μ=−0.04 *6* (2008Sp04,2014StZZ) Q=+0.01 *4* (1970Na05,2013StZZ) J$^\pi$: L(α,α')=L(t,p)=L(pol d,d′)=L(pol p,p′)=L(d,^{3}He)=2.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)†	Jπ#	$T_{1/2}$@	XREF	Comments
				$T_{1/2}$: weighted average of 1.09 ps *28* from ^{37}Cl(α,pγ), 1.11 ps *4* from ^{40}Ar(e,e′), 1.35 ps *10* from ^{40}Ar(p,p′γ) and 1.25 ps *14* from ^{12}C(^{36}S,2$\alpha\gamma$). μ: using transient-field technique (2008Sp04). Others: −2 *2* (1992Cu04), −0.03 *8* (2005St22). Q: from reorientation in Coulomb Excitation (1970Na05).
2120.91[f] *17*	0$^+$	104 ps *14*	A C EFGH LMNO Q UVWX	Jπ: L(α,α′)=L(p,p′)=0; 680$\gamma(\theta)$ is isotropic from (n,n′γ). $T_{1/2}$: from pγ(t) in (p,p′γ).
2524.09[f] *11*	2$^+$	0.23 ps *4*	A C EFGH KLMNO Q T V X	Jπ: L(α,α′)=L(pol d,d′)=L(pol p,p′)=2. $T_{1/2}$: weighted average of 0.24 ps *4* from (α,pγ), 0.194 ps *35* from (e,e′) and 0.34 ps *6* from (p,p′γ). Others: 0.50 ps *8* from ^{36}S(α,γ):resonances, 0.47 ps *7* from ^{12}C(^{36}S,2$\alpha\gamma$).
2892.65[c] *9*	4$^+$	1.95 ps *28*	A CDEFGHI LMNO Q V X	Jπ: L(α,α′)=L(pol d,d′)=L(pol p,p′)=4. $T_{1/2}$: weighted average of 2.9 ps *14* from ^{26}Mg(^{16}O,2pγ), 2.3 ps *6* from (α,pγ), 1.80 ps *28* from ^{12}C(^{36}S,2$\alpha\gamma$), and 3.0 ps *+18−9* from (p,p′γ).
3207.93 *13*	2$^+$	34 fs *7*	A C FGH KLMNO Q TUV X	Jπ: L(t,p)=L(pol p,p′)=2. $T_{1/2}$: weighted average of 28 fs *14* from (α,pγ) and 35 fs *7* from (e,e′). Others: 62 fs *12* from (α,γ):resonances, <24 fs from (p,p′γ).
3464.56[c] *12*	6$^+$	0.680 ns *21*	DE GHI Q X	Jπ: 571.88γ E2 to 4$^+$, L(t,p)=(6). $T_{1/2}$: from (α,pγ).
3511.54 *20*	2$^+$	59 fs *12*	A FGH K MNO q T V X	Jπ: L(pol d,d′)=L(d,^{3}He)=2. $T_{1/2}$: weighted average of 62 fs *12* from (α,γ):resonances, 49 fs *14* from (α,pγ) and 83 fs *31* from (p,p′γ).
3515[f] *1*	4$^+$	0.139 ps *28*	E G q	Jπ: from $\gamma(\theta)$ in (α,pγ) and γ(DCO) and band assignment in ^{26}Mg(^{18}O,2p2nγ).
3680.60 *12*	3$^-$	0.132 ps *28*	A C FGH K MNO Q V X	Jπ: L(α,α′)=L(pol d,d′)=L(pol p,p′)=3. $T_{1/2}$: from (α,pγ). Other: 0.10 ps *+6−5* from (p,p′γ).
3918.85 *12*	2$^+$	0.29 ps *3*	A FGH K MNo q	Jπ: 3918.6γ E2 to 0$^+$, L(t,p)=L(pol p,p′)=2. $T_{1/2}$: weighted average of 0.28 ps *3* from (α,pγ) and 0.30 ps *4* from (p,p′γ).
3941.9? *2*			A o q w	XREF: A(?). Jπ: (1,2$^+$) from possible 3941.7γ to 0$^+$ g.s.
4042 *2*	NATURAL		FGH MN Q w	XREF: N(4053). E(level): from (p,p′γ). Jπ: 0$^+$, 1$^-$, 2$^+$, 3$^-$, 4$^+$ from γ to 2$^+$ and π=natural in (α,α′).
4082.63 *16*	3$^-$	40 fs *14*	A FGH MN Q w	Jπ: based on $\gamma(\theta$,pol) in (α,pγ) and p$\gamma(\theta)$ in (p,p′γ), log *ft*=5.9 from 2$^-$ in ^{40}Cl β^- decay.
4178.9? *3*			A	XREF: A(?).
4230 *2*	4$^{(-)}$	>2.8 ps	C G m	Jπ: based on $\gamma(\theta$,pol) in (α,pγ).
4232 *2*	(1$^+$,2$^-$,3$^+$)	0.166 ps *28*	G mN Q	XREF: N(4240). Jπ: possible unnatural parity from (α,α′); 1705γ and 2768γ to 2$^+$.
4301.08 *23*	(3)$^-$	58 fs *14*	A FGh MN Q u	Jπ: log *ft*=5.1 from 2$^-$ in ^{40}Cl β^- decay;

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Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)†	Jπ#	$T_{1/2}$@	XREF	Comments
				possible natural parity in (α,α′); L(p,p′)=(2,3).
4324.5 *3*	2+	16 fs *6*	A FGh Q Tu	XREF: T(4360). Jπ: L(d,^{3}He)=0, L(t,p)=2. $T_{1/2}$: weighted average of 15 fs *6* from ^{36}S(α,γ):resonances and 18 fs *7* from (α,pγ).
4358.0 *3*			A N Q u	XREF: A(?)N(?). Jπ: π=(natural) from (α,α′), (1,2+) from possible 4357.6γ to 0+ g.s.
4420 *1*	(2+,3−)		G MNO q	XREF: N(4430). Jπ: 2959γ, 1896γ and 1212γ to 2+ gives (0+:4+); natural parity in (α,α′) for 4420 and/or 4427 levels gives 1−,2+,3−,4+; L(pol d,d′)=(2) gives (2+); L(pol p,p′)=3 gives 3−.
4427 *1*	(4+)	0.125 ps *21*	GH q	Jπ: L(t,p)=3,4; γ(θ,pol) in (α,pγ) gives 3+,4,5+; 4−,5+ is ruled out by RUL for 2966γ to 2+.
4473 *1*	1&	0.070 eV *13*	FG J N	XREF: N(4484). Jπ: from γ(θ) in (α,γ):resoances, (γ,γ′) and (α,pγ). $T_{1/2}$: from (2J+1)Γ_0^2/Γ=0.21 eV *4* with Γ_0/Γ=1 in (γ,γ′).
4481.0 *3*	1−	<0.07 ps	A M Q	XREF: A(?). Jπ: from γ(θ) in (p,p′γ); natural parity in (α,α′). $T_{1/2}$: from (p,p′γ).
4494[d] *1*	5−	0.50 ps *7*	C E GH	Jπ: 1601γ E1(+M2) to 4+, 1029γ d(+Q) to 6+. $T_{1/2}$: from (α,pγ).
4562.36 *16*	(1,3)−		A G Q T	XREF: T(4530). Jπ: log *ft*=5.4 from 2− in ^{40}Cl β− decay; possible natural parity in (α,α′).
4578 *1*	3(−)	37 fs *14*	A G N Q	XREF: A(?). Jπ: 2+,3 is given by 1983Bi08 in (α,pγ) based on γ(θ), but J^π=2+ should be ruled out since it results in ΔJ=2 for the 1685γ to 4+, which expects positive A_2 value while the measured A_2 by 1983Bi08 is negative. Natural parity in (α,α′) gives π=− for J=3.
4602 *1*		53 fs *20*	FG N Q	Jπ: 2078γ and 3141γ to 2+; possible natural parity in (α,α′). $T_{1/2}$: unweighted average of 73 fs *12* from (α,γ):resonances and 33 fs *14* from (α,pγ).
4674 *1*	(1+,2−,3+)	66 fs *17*	GH N Q u	XREF: N(4683). Jπ: 3213γ to 2+; possible π=unnatural in (α,α′).
4737.8? *4*			A Q u	XREF: A(?). Jπ: (1,2+) from possible 4737.5γ to 0+ g.s.
4769.0 *3*	1−	0.82 eV *6*	A G J N Q	Jπ: based on γ(θ,pol) in (pol γ,γ′) and γ(θ) in (α,pγ); possible π=natural in (α,α′). $T_{1/2}$: from (2J+1)Γ_0^2/Γ=2.46 eV *17* with Γ_0/Γ=1 in (γ,γ′).
4794 *1*	4+	52 fs *14*	GH N Q	XREF: N(4808). Jπ: 1901γ M1+E2 to 4+, L(t,p)=3,4.
4858 *1*	5−	37 fs *10*	G	Jπ: 1965γ E1(+M2) to 4+, 1394γ to 6+.
4870 *10*	3−		H NO Q	E(level): from (t,p). Jπ: L(pol d,d′)=3; L(t,p)=3,4.
4901? *3*			J	Jπ: (1,2+) from possible 4901γ to 0+ g.s.
4929 *1*	(1− to 4+)		G N	XREF: N(4941).

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Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[@]	XREF	Comments
				Jπ: 2405γ and 3468γ to 2^+ and 1248γ to 3^-.
4942.6? *4*			A q	XREF: A(?).
4959[f] *1*	6^+	0.10 ps *4*	E Gh q	Jπ: 1444γ and 2066γ E2 to 4^+; γ(DCO) and band assignment in ^{26}Mg(^{18}O,2p2nγ).
4972 *1*	$(2^+,3,4^+)$		Gh	Jπ: 2079γ to 4^+ and 3511γ to 2^+.
4991 *1*	$4^{(-)}$	2.1 ps *7*	G N Q	XREF: N(5004). Jπ: based on γ(θ,pol) of 765γ in (α,pγ), which implies a parity conserving transition to $4^{(-)}$. But the parity is inconsistent with possible natural parity in (α,α′), which is π=+ for J=4.
5110? *3*			J	Jπ: $(1,2^+)$ from possible 5110γ to 0^+.
5115 *2*	(5^-)		GH	Jπ: L(t,p)=(5).
5143 *2*	(5)	<10 fs	G	Jπ: 1628γ to 4^+ and 1678γ to 6^+ gives $(4^+,5,6^+)$; $T_{1/2}$ disfavors E2 for either transition.
5165.6 *8*	$(2)^+$		A G Q t	Jπ: 1650γ to 4^+ and 3704.6γ to 2^+; natural parity in (α,α′) favors $(2,4)^+$; L(d,^{3}He)=0 from $3/2^+$ for a level at 5200 gives $1^+,2^+$; $(1,2^+)$ from possible 5165.5γ to 0^+.
5191 *15*			H t	E(level): from (t,p). Jπ: L(d,^{3}He)=0 from $3/2^+$ for a level at 5200 gives $1^+,2^+$.
5245 *2*	$(0^+$ to $4^+)$		G	Jπ: 3784γ to 2^+.
5269.6 *3*	$(1^-,3^-)$		A G n Q u	Jπ: 1186.7γ and 1589.0γ to 3^- and 2063.0γ to 2^+; possible natural parity in (α,α′); log *ft*=5.9 from 2^- in ^{40}Cl β^- decay.
5293 *2*	(2^+)		Gh n u	Jπ: 3832γ to 2^+; L=2 for a level at 5298 *15* in (t,p).
5310 *2*	(2^+)		A Gh n Q u	XREF: A(?). Jπ: possible natural parity from (α,α′); 1228γ and 1629γ to 3^-; L=2 for a level at 5298 *15* in (t,p).
5350 *2*			G u	Jπ: 2457γ to 4^+.
5378 *2*	$(4^+,5,6^+)$		G	Jπ: 1863γ and 2485γ to 4^+ and 1913γ to 6^+.
5400.5 *8*	1^-	0.030 eV *7*	A H J N Q	XREF: N(?). Jπ: spin from γ(θ) in (γ,γ′); natural parity in (α,α′). L(p,p′)=(5) for a level at 5410 is inconsistent and it might imply that it is a different level. $T_{1/2}$: from $(2J+1)\Gamma_0^2/\Gamma$=0.09 eV *2* in (γ,γ′) assuming Γ_0/Γ=1.
5454 *15*	$3^-,4^+$		H N Q	E(level): from (t,p). Jπ: L(t,p)=3,4.
5508 *2*	NATURAL		GH Q	Jπ: natural parity from (α,α′); 1993γ to 4^+.
5544 *2*	$(0^+$ to $4^+)$		G	Jπ: 4083γ to 2^+.
5559 *2*	$(4^+,5^-,6^+)$		G Q	Jπ: 2044γ and 2666γ to 4^+ and 2094γ to 6^+; natural parity in (α,α′).
5608.8 *10*	(1,2,3)		A G q	Jπ: 4147.8γ to 2^+; log *ft*=6.3 from 2^- in ^{40}Cl β^- decay; possible natural parity in (α,α′) for a group near 5608.
5611 *2*			G q	Jπ: 2147γ to 6^+.
5630 *1*			A G q	XREF: A(?). Jπ: 1203γ to (4^+); possible natural parity from (α,α′) for a doublet.
5654 *2*			G	Jπ: 3130γ to 2^+.
5662 *2*			G n	Jπ: 2769γ to 4^+.
5675 *2*	$(3^-,4^+)$		GH n Q	Jπ: L(t,p)=3,4; possible natural parity in (α,α′).
5717.8? *10*			A n Q w	

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Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)†	Jπ#	$T_{1/2}$@	XREF	Comments
5766 *2*			G w	Jπ: 2558γ to 2+.
5818 *2*	(3−,4+)		GH T w	XREF: H(5835). Jπ: L(t,p)=3,4.
5880.3 *4*	1−	0.117 eV *13*	A J o q	Jπ: log *ft*=4.9 from 2− in ^{40}Cl β− decay; spin=1 from γ(θ) in (γ,γ′). $T_{1/2}$: from (2J+1)Γ_0^2/Γ=0.35 eV *4* in (γ,γ′) assuming Γ_0/Γ=1.
5885 *2*	3−		GH No q	XREF: N(5900). Jπ: L(pol p,p′)=3; L(pol d,d′)=(3). But L(t,p)=2 for a level at 5883 *15* is inconsistent.
5906.0 *7*	(1−)		A q	Jπ: 3784.9γ to 0+; log *ft*=5.8 from 2− in ^{40}Cl β− decay; possible natural parity in (α,α′).
5912 *3*	1&	0.050 eV *17*	J q	E(level): a level at the same energy is also observed in (α,pγ) but with completely different decay mode and it is considered by evaluator as a separate level. $T_{1/2}$: from (2J+1)Γ_0^2/Γ=0.15 eV *5* in (γ,γ′) assuming Γ_0/Γ=1.
5912 *2*	(1− to 4+)		G q	Jπ: 1830γ to 3− and 2704γ to 2+.
5931 *2*	(2+,3,4+)		G	Jπ: 3038γ to 4+ and 4470γ to 2+.
5950.5 *10*	(1,2)		A	Jπ: 5950.0γ to 0+; log *ft*=6.9 from 2− in ^{40}Cl β− decay.
5973e *2*	(6−)		E G	Jπ: from (α,pγ) based on analog in ^{42}Ca, and from γ(DCO) in ^{26}Mg(^{18}O,2p2nγ).
6013d *2*	(7−)		E G	Jπ: from (α,pγ) based on analog in ^{42}Ca, and from γ(DCO) and band assignment in ^{26}Mg(^{18}O,2p2nγ).
6053.6 *8*	1(−)	0.41 eV *6*	A J q	Jπ: spin from γ(θ) in (γ,γ′); log *ft*=5.9 from 2− in ^{40}Cl β− decay. $T_{1/2}$: from (2J+1)Γ_0^2/Γ=1.24 eV *19* in (γ,γ′) assuming Γ_0/Γ=1.
6054	4+		O q	E(level): as quoted in 1976Se09 in (pol d,d′). A level at the same energy is also observed in ^{40}Cl β− decay and (γ,γ′) but with $J^\pi=1^{(-)}$. Therefore it is considered as a separate level. Jπ: L(pol d,d′)=4.
6100 *2*	(1,2+)		G J	Jπ: based on γγ(θ) in (γ,γ′) and 6100γ to 0+. Γ_0=0.22 eV *6* for J(6100)=1 and 0.13 eV *4* f0r J(6100)=2 from (2J+1)Γ_0^2/Γ=0.17 eV *5* in (γ,γ′) with Γ_0/Γ=0.26.
6104 *2*			G	Jπ: 3211γ to 4+.
6138 *2*			A GH N Q	XREF: A(?). Jπ: 2674γ to 6+, but L=(2,3) in (p,p′) and L(t,p)=(5) are inconsistent.
6158 *2*	(4+,5,6+)		G	Jπ: 2693γ to 6+ and 3265γ to 4+.
6185 *2*			G	Jπ: 1691γ to 5−.
6203 *2*			G q T	XREF: T(6230). Jπ: 3310γ to 4+; natural parity in (α,α′).
6208.5 *8*	(1,2)		A q	Jπ: 6208γ to 0+; log *ft*=6.6 from 2− in ^{40}Cl β− decay.
6270 *2*			G n	Jπ: 2806γ to 6+.
6276.0? *9*	1−,2−,3−		A n	XREF: A(?). Jπ: log *ft*=5.6 from 2− in ^{40}Cl β− decay.
6305 *2*	(4+,5,6+)		GH n	Jπ: 2790γ to 4+ and 2840γ to 6+.

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Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[@]	XREF	Comments
6338.7 *11*	1^-	0.29 eV *3*	A J	Jπ: spin from γγ(θ) in (γ,γ′); log *ft*=5.6 from 2^- in ^{40}Cl β^- decay. $T_{1/2}$: from $(2J+1)\Gamma_0^2/\Gamma$=0.87 eV *10* in (γ,γ′) with Γ_0/Γ=1.
6356 *2*	$(4^+$ to $7^-)$		G	Jπ: 1498γ to 5^- and 2891γ to 6^+.
6421[‡]	(8^-)[b]		E	
6450? *3*			J	
6476.0 *8*	1^-	0.43 eV *5*	A H J N	Jπ: spin from γγ(θ) in (γ,γ′); log *ft*=5.6 from 2^- in ^{40}Cl β^- decay. L(t,p)=(2) is inconsistent. $T_{1/2}$: from $(2J+1)\Gamma_0^2/\Gamma$=1.29 eV *16* in (γ,γ′) with Γ_0/Γ=1.
6651.7 *8*			A H N	XREF: A(?)N(6650).
6703 *3*	1[&]		J	
6760 *15*	$3^-,4^+$		H	E(level): from (t,p). Jπ: L(t,p)=3,4.
6806[f]	(8^+)		E G	E(level): from (α,pγ). Other: 6801 from ^{26}Mg(^{18}O,2p2nγ). Jπ: from γ(DCO) and band assignment in ^{26}Mg(^{18}O,2p2nγ); possible analog state of ^{42}Ca (1983Bi08) from (α,pγ).
6835 *15*	$3^-,4^+$		H	E(level): from (t,p). Jπ: L(t,p)=3,4.
6979[e]	(8^-)		E G	Jπ: from γ(DCO) and band assignment in ^{26}Mg(^{18}O,2p2nγ); possible analog state of ^{42}Ca (1983Bi08) from (α,pγ).
7070 *15*			H	E(level): from (t,p).
7168 *3*	1[&]		H J	
7246 *3*	1[&]		J	
7281 *3*	1[&]		H J N	XREF: H(7300)N(7300).
7519 *3*	1[&]		H J	XREF: H(7495).
7626 *3*	1[&]		J	
7640 *15*	2^+		H	E(level): from (t,p). Jπ: L(t,p)=2.
7688[‡d]	(9^-)[b]		E	
7708 *3*	1^-[&]		J	
7730 *3*			H	E(level): from (t,p).
7918 *2*	1^-[&]		H J	XREF: H(7890).
7993 *3*	1^-[&]		E H J	XREF: H(7980).
7999[‡e]	(10^-)[b]		E	
8032 *3*	1^-[&]		J	
8163 *2*	1^-[&]		J	
8191 *3*	1^-[&]		J	
8303 *3*	1^-[&]		J	
8552 *3*	1^-[&]		J	
8585 *3*	1^-[&]		J	
8644 *3*	1^-[&]		J	
8676 *3*	$1,2^+$[&]		J	
8834 *4*	1^-[&]		J	

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Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[@]	XREF	Comments
8884 *3*	1−[&]		J	
8918 *3*	1−[&]	0.34 eV *14*	F iJ	$T_{1/2}$: from (γ,γ′).
8946[‡d]	(11−)[b]		E	
9070[‡f]	(10+)[b]		E	
9127 *3*	1−[&]	0.71 eV *14*	F iJ	$T_{1/2}$: from (γ,γ′). 0.72 eV *16* from ^{36}S(α,γ):resonances.
9138 *6*	(1−,2+)[a]		F	
9147 *5*	1−[a]		F	
9178 *3*	1−[a]		F	
9197 *6*	(1−,2+)[a]		F	
9216 *4*	1−[a]		F	
9234 *4*	1−[a]		F	
9240 *6*	1−[a]		F	
9264 *4*	(1−,2+)[a]		F	
9273 *6*	1−[a]		F	
9287 *4*			F	
9296 *5*	(1−,2+)[a]		F	
9314 *4*	1−[&a]		F J	
9330 *4*	1−[a]		F	
9337 *3*	1−[a]		F J	
9355 *3*	1−[&a]	1.0 eV *3*	F J	$T_{1/2}$: from (γ,γ′). 1.1 eV *3* from (α,γ):resonances.
9373 *4*			F	
9416 *3*	1−[&a]	3.4 eV *18*	F J	E(level): doublet: 9408+9417 in (α,γ) with same J^π for both; the second component seems to correspond to 9416 in (γ,γ′). $T_{1/2}$: from (γ,γ′). 4.0 eV *20* from ^{36}S(α,γ):resonances.
9425 *5*	(1−,2+)[a]		F	
9433 *5*	(1−,2+)[a]		F	
9450 *3*	1−[a]		F	
9472 *4*	(1−,2+)[a]		F	
9485 *5*	1−[a]		F	
9491?			F	
9504.2 *14*	1−[&a]	7.9 eV *13*	F J	$T_{1/2}$: from (γ,γ′). 8.2 eV *18* from ^{36}S(α,γ):resonances.
9527 *4*			F	
9565 *4*	1−[a]		F	
9583 *3*	1−[&a]	7.3 eV *21*	F J	E(level): doublet:9581+9586 in (α,γ), 9580+9585 in (γ,γ′); the second component has J^π=(1−,2+) in (α,γ). $T_{1/2}$: from (γ,γ′).
9596 *4*			F	
9608 *5*			F	
9617 *3*	1−[&a]		F J	
9656 *4*	1−[a]		F	
9669 *4*	1−[a]		F	
9690 *5*	(1−,2+)[a]		F	E(level),Jπ: doublet:9687+9694 with the same J^π for both.
9736 *3*	1−[a]		F	
9757 *3*	1+[&]	0.56 eV *22*	F J	Jπ: (1−,2+) from γ(θ) and natural parity in (α,γ):resonances. $T_{1/2}$: from (γ,γ′).
9769 *4*	(1−,2+)[a]		F	
9787 *4*	1−[a]		F	

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Adopted Levels, Gammas (continued)

^{40}Ar Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[@]	XREF	Comments
9813 *3*	1^-[a]		F	
9825 *3*	1^-[a]		F	
9840 *3*	1^-[&]		J	
9851 *2*	1^-[&a]	21 eV *4*	F J	E(level): doublet: 9849+9852 in (α,γ). $T_{1/2}$: from (γ,γ′). 22 eV *6* from ^{36}S(α,γ):resonances.
9866 *4*			F	
9881 *4*	1^-[a]		F	
9893 *4*	1^-[a]		F	
9912 *5*	$(1^-,2^+)$[a]		F	
9944 *3*	1^-[a]		F	
9952 *3*	1^-[&]	10 eV *3*	F J	E(level): weighted average of 9954 *3* from (α,γ), 9950 *3* from (γ,γ′). $T_{1/2}$: from (γ,γ′). ≥9.6 eV from ^{36}S(α,γ):resonances.
10090 *3*	1^-[&]		J	
10151 *3*	1^-[&]		J	
10179 *2*	1^-[&]		J	
10362 *3*	$1,2^+$[&]		J	
10745 *3*	1^-[&]		J	
10857 *3*	1^-[&]		J	
11769[‡f]	(12^+)[b]		E	
17.7×10^3 *2*	2^+		Q	E(level),Jπ: isoscalar giant-quadrupole resonance with L(α,α′)=2.

[†] From a least-squares fit to γ-ray energies if values with uncertainties are available, otherwise, from (α,pγ) up to 6979 level and from (α,γ):resonances after 8919 level if available, unless otherwise noted.

[‡] From ^{26}Mg(^{18}O,2p2nγ).

[#] In (d,^{3}He) reaction, ^{41}K target J^π(g.s.)=$3/2^+$.

[@] Values of half-lives are from (α,pγ), unless otherwise noted; widths are from (γ,γ′) and/or (α,γ). Some half-lives are also available from (p,p′γ) and (α,γ) and weighted averages are taken when values are from more than one reactions. In addition to the width values from (γ,γ′) given here for levels with known γ-decay branching ratios, width data for other levels (mostly α-unbound) with unknown γ-decay branching ratios are also available in that dataset.

[&] From (γ,γ′), based on γ(θ) in (γ,γ′), parity from polarization asymmetry if available.

[a] From (α,γ):resonances, based on γ(θ) and natural parity.

[b] From ^{26}Mg(^{18}O,2p2nγ) based on γ(DCO) and band assignment.

[c] Band(A): Member of $f^2_{7/2}$ yrast sequence.

[d] Band(B): Band based on 5^-, α=1.

[e] Band(C): Band based on (6^-), α=0.

[f] Band(D): SD band. Q(transition)=1.45 *+49−31*(stat) *15*(syst) (2010Id02) from ^{26}Mg(^{18}O,2p2nγ). Possible configuration=$\pi[(d5/2)^{-1.2}(s_{1/2}d_{3/2})^{-3.8}\ (fp)^{2.5}(g_{9/2})^{0.5}]\otimes\nu[(d5/2)^{-0.7}(s_{1/2}d_{3/2})^{-2.4}\ (fp)^{4.5}(g_{9/2})^{0.5}]$.

Adopted Levels, Gammas (continued)

γ(^{40}Ar)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	δ[@]	Comments
1460.849	2^+	1460.820 *5*	100	0	0^+	E2		B(E2)(W.u.)=9.0 *4* E_γ: from ^{40}K ε decay. Other: 1460.73 *5* from ^{40}Cl β^- decay. Mult.: from γ(θ,pol) in ^{26}Mg(^{16}O,2pγ), γ(θ) in ^{40}Ar(p,p′γ) and ce data in ^{40}K ε decay.
2120.91	0^+	660.1 *4*	100	1460.849	2^+	[E2]		B(E2)(W.u.)=5.3 *8* E_γ: from ^{40}Cl β^- decay.
2524.09	2^+	403[&]	<1.7	2120.91	0^+			E_γ,I_γ: from ^{40}Ar(p,p′γ).
		1063.1 *2*	100 *2*	1460.849	2^+	M1+E2	−0.41 *+6−13*	B(M1)(W.u.)=0.037 *6*; B(E2)(W.u.)=18 *5* I_γ: from ^{37}Cl(α,pγ). Others: 100 *10* from ^{40}Cl β^- decay, and 100 *3* from ^{40}Ar(p,p′γ). Mult.,δ: from (p,p′γ).
		2524.1 *2*	74 *2*	0	0^+	E2		B(E2)(W.u.)=1.19 *18* I_γ: weighted average of 86 *10* from ^{40}Cl β^- decay, 75.4 *18* from ^{37}Cl(α,pγ), and 69 *3* from ^{40}Ar(p,p′γ). Mult.: Q from (p,p′γ); M2 is ruled out by RUL.
2892.65	4^+	369.0 *6*	1.0 *5*	2524.09	2^+	[E2]		B(E2)(W.u.)=5×10^1 *3*
		1431.82 *10*	100 *10*	1460.849	2^+	E2		B(E2)(W.u.)=5.9 *9* E_γ: weighted average of 1432.1 *4* from ^{40}Cl β^- decay and 1431.80 10 from ^{37}Cl(α,pγ). Additional information 1. Mult.: from γ(θ,pol)in ^{26}Mg(^{16}O,2pγ), γ(θ) in (p,p′γ); M2 is ruled out by RUL.
3207.93	2^+	315.0 *5*	0.9 *3*	2892.65	4^+	[E2]		B(E2)(W.u.)=5.1×10^3 *21* is much higher than allowed by RUL.
		1087.6 *4*	3.0 *15*	2120.91	0^+	[E2]		B(E2)(W.u.)=35 *19*
		1746.5 *2*	100 *1*	1460.849	2^+	M1+E2	+0.11 *7*	B(M1)(W.u.)=0.104 *22*; B(E2)(W.u.)=1.3 *+17−13* I_γ: from ^{37}Cl(α,pγ). Others: 100 *9* from ^{40}Cl β^- decay and 100 *3* from ^{40}Ar(p,p′γ). Mult.,δ: D+Q from γ(θ) in (p,p′γ), polarity from no level-parity change determined from other evidence.
		3208.2 *3*	11.7 *16*	0	0^+	[E2]		B(E2)(W.u.)=0.61 *16* I_γ: weighted average of 18 *3* from ^{40}Cl β^- decay, 11.1 *11* from ^{37}Cl(α,pγ), and 10 *3* from ^{40}Ar(p,p′γ).
3464.56	6^+	571.91 *8*	100	2892.65	4^+	E2		B(E2)(W.u.)=1.67 *6* E_γ: from (α,pγ). Mult.: from γ(θ,pol) in ^{26}Mg(^{16}O,2pγ), γ(θ) in (α,pγ); M2 is ruled out by RUL.
3511.54	2^+	303.0 *6*	3.2 *18*	3207.93	2^+			I_γ: weighted average of 5 *3* from ^{40}Cl β^- decay and 2.2 *23* from ^{40}Ar(p,p′γ).
		621.1 *6*	2 *2*	2892.65	4^+	[E2]		B(E2)(W.u.)=2.0×10^2 *+21−20* I_γ: from (α,pγ).

From ENSDF

$^{40}_{18}Ar_{22}$-9

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [#]	E_f	J_f^π	Mult. [@]	δ [@]	Comments
3511.54	2+	987	6.2 *12*	2524.09	2+			I_γ: from (α,pγ).
		2050.5 *4*	100 *2*	1460.849	2+	M1(+E2)	−0.05 *11*	B(M1)(W.u.)=0.034 *7* I_γ: from ^{40}Ar(p,p′γ). Others: 100 *15* from ^{40}Cl β− decay, 100 *4* from ^{37}Cl(α,pγ). Mult.,δ: D(+Q) from γ(θ) in (p,p′γ), polarity from no level-parity change determined from other evidence.
		3511.0 *5*	14.7 *17*	0	0+	[E2]		B(E2)(W.u.)=0.26 *6* I_γ: weighted average of 15 *6* from ^{40}Cl β− decay, 17.3 *25* from ^{37}Cl(α,pγ), and 12.4 *23* from ^{40}Ar(p,p′γ).
3515	4+	622	52 *3*	2892.65	4+	M1(+E2)	−0.07 *10*	B(M1)(W.u.)=0.20 *5* Mult.,δ: D(+Q) from γ(θ) in (α,pγ); E1(+M2) ruled out by RUL.
		991	15 *8*	2524.09	2+	[E2]		B(E2)(W.u.)=5×10^1 *3*
		2054	100 *3*	1460.849	2+	[E2]		B(E2)(W.u.)=8.2 *18*
3680.60	3−	170[&]	<8	3511.54	2+			E_γ,I_γ: from (p,p′γ).
		472.0 *4*	3.5 *12*	3207.93	2+	[E1]		B(E1)(W.u.)=0.0012 *5*
		788.1 *3*	11.9 *12*	2892.65	4+	[E1]		B(E1)(W.u.)=0.00086 *21* I_γ: weighted average of 11.6 *12* from ^{40}Cl β− decay, 11.6 *12* from ^{37}Cl(α,pγ), and 18 *4* from ^{40}Ar(p,p′γ).
		1156.2 *4*	5.2 *7*	2524.09	2+	[E1]		B(E1)(W.u.)=0.00012 *3* I_γ: weighted average of 7.0 *12* from ^{40}Cl β− decay, 4.7 *6* from ^{37}Cl(α,pγ), and 7 *4* from ^{40}Ar(p,p′γ).
		2220.0 *2*	100 *2*	1460.849	2+	E1(+M2)	−0.07 *+5−11*	B(E1)(W.u.)=0.00032 *7* I_γ: from ^{37}Cl(α,pγ). Others: 100 *14* from ^{40}Cl β− decay, and 100 *4* from ^{40}Ar(p,p′γ). Mult.,δ: D(+Q) from pγ(θ) in (p,p′γ), polarity from level-parity change determined from other evidence.
		3681[&]	<6	0	0+	[E3]		B(E3)(W.u.)<3×10^2
3918.85	2+	239.0 *3*	1.4 *8*	3680.60	3−	[E1]		B(E1)(W.u.)=0.0012 *7* E_γ: from ^{40}Cl β− decay, observed in (p,p′γ) but not in (α,pγ). I_γ: scaled from Iγ(2457.7)=30 *3* from (α,pγ) by the factor of Iγ(239.0)/Iγ(2457.7)=4.8 *23*/100 *17* from ^{40}Cl β− decay.
		1394.7 *3*	22 *3*	2524.09	2+			I_γ: from (α,pγ). Others: 13.6 *17* from (p,p′γ), 26 *4* from ^{40}Cl β− decay.
		1797.8 *2*	15 *3*	2120.91	0+	[E2]		B(E2)(W.u.)=1.1 *3* I_γ: from (α,pγ). Others: 20 *3* from (p,p′γ), 47 *7* from ^{40}Cl β− decay.
		2457.7 *4*	30 *3*	1460.849	2+	M1+E2		I_γ: from (α,pγ). Others: 36 *5* from (p,p′γ), 100 *17* from ^{40}Cl β− decay. Mult.: D+Q from γ(θ) in (p,p′γ), polarity from no level-parity change determined from other evidence. δ: <−0.3 or >+6 from (p,p′γ).
		3918.6 *2*	100 *7*	0	0+	E2		B(E2)(W.u.)=0.154 *21* I_γ: from (α,pγ). Others: 100 *5* from (p,p′γ), 83 *9* from ^{40}Cl β− decay. It is seen

From ENSDF

$^{40}_{18}Ar_{22}$-10

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	δ[@]	Comments
								from the gamma spectrum in 1972Kl06 in ^{40}Cl β^- decay that the 3919 single−escape−peak+full−energy−peak is much stronger than the 2458 peak. It is possible that the intensity of 3919 single-escape peak is not taken into account for the total intensity of the 3919 gamma-ray by 1972Kl06.
								Mult.: Q from γ(θ) in (p,p′γ); M2 is ruled out by RUL.
3941.9?		3941.7[&] *2*	100	0	0^+			
4042	NATURAL	1518 *2*	100 *16*	2524.09	2^+			E_γ: from (p,p′γ).
								I_γ: from ^{36}S(α,γ):resonances. Other: 100 *22* from ^{40}Ar(p,p′γ).
		2581	62 *16*	1460.849	2^+			I_γ: weighted average of 59 *16* from ^{36}S(α,γ):resonances and 67 *22* from ^{40}Ar(p,p′γ).
4082.63	3^-	1558.7 *4*	3.3 *4*	2524.09	2^+	[E1]		B(E1)(W.u.)=0.00012 *5*
		2621.7 *2*	100 *9*	1460.849	2^+	[E1]		B(E1)(W.u.)=0.0008 *3*
		4082.1 *8*	1.7 *3*	0	0^+	[E3]		B(E3)(W.u.)=2.7×10^2 *11*
4178.9?		4178.7[&] *3*	100	0	0^+			
4230	$4^{(-)}$	547 *2*	89 *4*	3680.60	3^-	D+Q	−10 *+3−9*	E_γ: from (p,p′γ).
								Mult.,δ: based on γ(θ,pol) in (α,pγ).
		1338 *2*	100 *4*	2892.65	4^+	D(+Q)	+0.6 *+4−8*	Mult.,δ: based on γ(θ) in (α,pγ).
								E_γ: from (p,p′γ).
4232	$(1^+,2^-,3^+)$	1708 *2*	100 *4*	2524.09	2^+			E_γ: from (p,p′γ).
		2771	30 *4*	1460.849	2^+			
4301.08	$(3)^-$	621.1 *6*	<0.9	3680.60	3^-			
		1092.9 *8*	1.0 *2*	3207.93	2^+	[E1]		B(E1)(W.u.)=8×10^{-5} *3*
		1776.9 *8*	0.06 *1*	2524.09	2^+	[E1]		B(E1)(W.u.)=1.1×10^{-6} *4*
		2840.1 *3*	100 *15*	1460.849	2^+	[E1]		B(E1)(W.u.)=0.00043 *14*
4324.5	2^+	2864	43 *9*	1460.849	2^+			I_γ: from from ^{36}S(α,γ):resonances. Not seen in ^{40}Cl β^- decay. Other: 100 *7* from (α,pγ).
		4324.2 *3*	100 *9*	0	0^+	[E2]		B(E2)(W.u.)=0.8 *4*
								I_γ: from ^{36}S(α,γ):resonances. Other: 41 7from (α,pγ).
4358.0		4357.6[&] *3*	100	0	0^+			
4420	$(2^+,3^-)$	1212	11 *2*	3207.93	2^+			
		1896	10 *2*	2524.09	2^+			
		2959	100 *5*	1460.849	2^+			E_γ: 2958 *3* from (p,p′γ).
4427	(4^+)	1534	75 *9*	2892.65	4^+	D+Q		Mult.: from (α,pγ) based on γ(θ).
								δ: −0.2 to +1.0 from (α,pγ) based on γ(θ).
		2966	100 *9*	1460.849	2^+	[E2]		B(E2)(W.u.)=1.4 *3*
4473	1	4473 *3*	100	0	0^+			
4481.0	1^-	4480.7 *3*	100	0	0^+	D		Mult.: based on γ(θ) in (p,p′γ).
4494	5^-	264	3.0 *5*	4230	$4^{(-)}$			I_γ: from (α,pγ).

From ENSDF

$^{40}_{18}Ar_{22}$-11

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	δ[@]	Comments
4494	5^-	979	15 *2*	3515	4^+	[E1]		B(E1)(W.u.)=0.000113 *23* I_γ: from (α,pγ).
		1029	46 *3*	3464.56	6^+	D(+Q)	+0.06 *+7−10*	I_γ: from (α,pγ). Mult.,δ: from (α,pγ), based on γ(θ).
		1601	100 *5*	2892.65	4^+	E1(+M2)	0.00 *+6−9*	B(E1)(W.u.)=0.00017 *3* I_γ: from (α,pγ). Mult.,δ: from (α,pγ), based on γ(θ,pol).
4562.36	$(1,3)^-$	261.2 *7*	7.1 *7*	4301.08	$(3)^-$			
		479.9 *4*	7.9 *14*	4082.63	3^-			I_γ: other: 18.4 *21* from (α,pγ).
		643.6 *3*	59 *4*	3918.85	2^+			I_γ: other: 86 *8* from (α,pγ).
		881.3 *3*	22.9 *22*	3680.60	3^-			
		1051.1 *5*	4.3 *7*	3511.54	2^+			
		1353.7 *5*	1.8 *7*	3207.93	2^+			
		3101.7 *4*	100 *14*	1460.849	2^+			I_γ: other: 100 *8* from (α,pγ).
4578	$3^{(-)}$	222.5[&] *5*		4358.0				E_γ: observed only in ^{40}Cl β^- decay.
		1067	90 *10*	3511.54	2^+			
		1370	38 *5*	3207.93	2^+			
		1685	100 *10*	2892.65	4^+	D+Q		Mult.: based on γ(θ) in (α,pγ). δ: −0.05 to +0.72 for J=3 based on γ(θ) in (α,pγ).
		3117	28 *5*	1460.849	2^+			
		4580.1[&] *5*		0	0^+	[E3]		E_γ: observed only in ^{40}Cl β^- decay.
4602		2078	100 *2*	2524.09	2^+			
		3141	11 *2*	1460.849	2^+			
4674	$(1^+,2^-,3^+)$	3213	100	1460.849	2^+			
4737.8?		4737.5[&] *4*	100	0	0^+			
4769.0	1^-	4768.7 *3*	100	0	0^+			
4794	4^+	1901	100 *10*	2892.65	4^+	M1+E2		Mult.,δ: based on γ(θ,pol) in (α,pγ) with δ(E2/M1)=0.22 *+13−5* or +1.60 *15*.
		3333	100 *10*	1460.849	2^+	[E2]		B(E2)(W.u.)=1.6 *5*
4858	5^-	364	15 *8*	4494	5^-			
		1394	36 *2*	3464.56	6^+	[E1]		B(E1)(W.u.)=0.0014 *4*
		1965	100 *3*	2892.65	4^+	E1(+M2)	−0.09 *+8−12*	B(E1)(W.u.)=0.0014 *4* Mult.,δ: based on γ(θ,pol) in (α,pγ).
4901?		4901[&] *3*		0	0^+			
4929	$(1^-$ to $4^+)$	1248	100 *8*	3680.60	3^-			
		2405	44 *6*	2524.09	2^+			
		3468	56 *6*	1460.849	2^+			
4942.6?		361.3[&] *5*	90 *20*	4578	$3^{(-)}$			
		381.0[&] *5*	100 *40*	4562.36	$(1,3)^-$			
4959	6^+	1444	100 *5*	3515	4^+	E2		B(E2)(W.u.)=7×10[1] *3* Mult.: based on γ(θ) in (α,pγ); RUL rules out M2.

From ENSDF

$^{40}_{18}Ar_{22}$-12

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	Comments
4959	6^+	2066	56 *5*	2892.65	4^+	E2	B(E2)(W.u.)=7 *3* Mult.: based on $\gamma(\theta)$ in $(\alpha,p\gamma)$; RUL rules out M2.
4972	$(2^+,3,4^+)$	2079	100 *7*	2892.65	4^+		
		3511	69 *7*	1460.849	2^+		
4991	$4^{(-)}$	761	100 *2*	4230	$4^{(-)}$	(M1+E2)	Mult.,δ: from $\gamma(\theta$,pol) in $(\alpha,p\gamma)$, with δ(Q/D)=−0.13 to +0.77 or −0.72 to −1.5.
		909	11 *1*	4082.63	3^-		
		1310	10 *1*	3680.60	3^-		
5110?		5110[&] *3*		0	0^+		
5115	(5^-)	1651	100	3464.56	6^+		
5143	(5)	1628	20 *2*	3515	4^+		
		1678	100 *2*	3464.56	6^+		
5165.6	$(2)^+$	1650	100 *4*	3515	4^+		E_γ,I_γ: observed in $(\alpha,p\gamma)$ only. This strong transition is not seen in ^{40}Cl β^- decay. It could suggest that it may be misplaced.
		3704.6 *8*	43 *4*	1460.849	2^+		I_γ: from $(\alpha,p\gamma)$. Other: 100 *10* from ^{40}Cl β^- decay.
		5165.5[&] *10*	4 *2*	0	0^+		E_γ: observed in ^{40}Cl β^- decay only. I_γ: normalized to I(3704.6γ)=43 *4* from $(\alpha,p\gamma)$ by the factor of I(5165.5γ)/I(3704.6γ)=10 *5*/100 *10* from ^{40}Cl β^- decay.
5245	$(0^+$ to $4^+)$	3784	100	1460.849	2^+		
5269.6	$(1^-,3^-)$	1186.7 *4*	75 *8*	4082.63	3^-		
		1589.0 *3*	100 *17*	3680.60	3^-		
		2063.0 *10*	42 *17*	3207.93	2^+		
5293	(2^+)	3832	100	1460.849	2^+		
5310	(2^+)	748	23 *2*	4562.36	$(1,3)^-$		
		1228	85 *6*	4082.63	3^-		
		1629	100 *6*	3680.60	3^-		
		5309.6[&] *10*		0	0^+		E_γ: only transition observed from a level at 5310 in ^{40}Cl β^- decay, not observed in other studies. The evaluator has considered this transition as questionable.
5350		2457	100	2892.65	4^+		
5378	$(4^+,5,6^+)$	1863	42 *4*	3515	4^+		
		1913	55 *4*	3464.56	6^+		
		2485	100 *8*	2892.65	4^+		
5400.5	1^-	5400.1 *8*	100	0	0^+		
5508	NATURAL	1993	100	3515	4^+		
5544	$(0^+$ to $4^+)$	4083	100	1460.849	2^+		
5559	$(4^+,5^-,6^+)$	2044	46 *4*	3515	4^+		
		2094	61 *4*	3464.56	6^+		
		2666	100 *7*	2892.65	4^+		
5608.8	(1,2,3)	4147.7 *10*	100	1460.849	2^+		
5611		2147	100	3464.56	6^+		
5630		1203	100	4427	(4^+)		

From ENSDF

$^{40}_{18}Ar_{22}$-13

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Comments
5630		5629.0[&] *10*		0	0^+	E_γ: only transition observed from a level at 5630 in ^{40}Cl β^- decay, not observed in other studies. The evaluator has considered this transition as questionable.
5654		3130	100	2524.09	2^+	
5662		2769	100	2892.65	4^+	
5675	$(3^-,4^+)$	1994	100	3680.60	3^-	
5717.8?		3193.7[&] *10*	100	2524.09	2^+	
5766		2558	100	3207.93	2^+	
5818	$(3^-,4^+)$	2925	100	2892.65	4^+	
5880.3	1^-	1317.2 *5*	10 *1*	4562.36	$(1,3)^-$	
		1579.9 *8*	8 *2*	4301.08	$(3)^-$	
		3356.6 *8*	8 *3*	2524.09	2^+	
		3759.9 *10*	2.6 *13*	2120.91	0^+	
		5879.6 *12*	100 *5*	0	0^+	
5885	3^-	2992	100 *7*	2892.65	4^+	
		4424	87 *7*	1460.849	2^+	
5906.0	(1^-)	3784.9 *6*	100	2120.91	0^+	
5912	1	5912 *3*	100	0	0^+	
5912	$(1^-$ to $4^+)$	1830	100 *10*	4082.63	3^-	
		2704	100 *10*	3207.93	2^+	
5931	$(2^+,3,4^+)$	3038	100 *6*	2892.65	4^+	
		4470	39 *6*	1460.849	2^+	
5950.5	(1,2)	5950.0 *10*	100	0	0^+	
5973	(6^-)	2508	100	3464.56	6^+	
6013	(7^-)	1519	100 *6*	4494	5^-	E_γ: 1522 from ^{26}Mg(^{18}O,2p2nγ).
		2548	100 *6*	3464.56	6^+	E_γ: 2553 from ^{26}Mg(^{18}O,2p2nγ).
6053.6	$1^{(-)}$	6053.1 *8*	100	0	0^+	
6100	$(1,2^+)$	4638 *3*	100 *7*	1460.849	2^+	E_γ: from (γ,γ′).
		6100	33 *7*	0	0^+	
6104		3211	100	2892.65	4^+	
6138		2674	100	3464.56	6^+	
6158	$(4^+,5,6^+)$	2693	100 *2*	3464.56	6^+	
		3265	15 *2*	2892.65	4^+	
6185		1691	100	4494	5^-	
6203		3310	100	2892.65	4^+	
6208.5	(1,2)	6208.0 *8*	100	0	0^+	
6270		2805	100	3464.56	6^+	
6276.0?	$1^-,2^-,3^-$	1333.4[&] *8*	100	4942.6?		
6305	$(4^+,5,6^+)$	2790	100 *8*	3515	4^+	
		2840	67 *8*	3464.56	6^+	
6338.7	1^-	6338.2 *11*	100	0	0^+	
6356	$(4^+$ to $7^-)$	1498	100 *8*	4858	5^-	

From ENSDF

$^{40}_{18}Ar_{22}$-14

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	Comments
6356	(4$^+$ to 7$^-$)	2891	49 *8*	3464.56	6$^+$		
6421	(8$^-$)	2956[‡]		3464.56	6$^+$		
6450?		6450[&] *3*		0	0$^+$		
6476.0	1$^-$	6475.5 *8*	100	0	0$^+$		
6651.7		1042.3[&] *3*	100	5608.8	(1,2,3)		
6703	1	6703 *3*	100	0	0$^+$		
6806	(8$^+$)	1847	100	4959	6$^+$		E_γ: from (α,pγ). Other: 1841 from (^{18}O,2p2nγ).
6979	(8$^-$)	1006	100	5973	(6$^-$)		
7168	1	7168 *3*	100	0	0$^+$		
7246	1	7246 *3*	100	0	0$^+$		
7281	1	7281 *3*	100	0	0$^+$		
7519	1	7519 *3*	100	0	0$^+$		
7626	1	6168[&] *3*		1460.849	2$^+$		
		7626 *3*	100	0	0$^+$		
7688	(9$^-$)	709[‡]		6979	(8$^-$)		
		1671[‡]		6013	(7$^-$)		
7708	1$^-$	7708 *3*	100	0	0$^+$	E1	
7918	1$^-$	7918 *2*	100	0	0$^+$	E1	
7993	1$^-$	7993 *3*	100	0	0$^+$	E1	
7999	(10$^-$)	311[‡]		7688	(9$^-$)		
		1020[‡]		6979	(8$^-$)		
		1578[‡]		6421	(8$^-$)		
8032	1$^-$	6570[&] *3*		1460.849	2$^+$		
		8032 *3*	100	0	0$^+$	E1	
8163	1$^-$	6703[&] *2*		1460.849	2$^+$		
		8163 *2*	100	0	0$^+$	E1	
8191	1$^-$	8191 *3*	100	0	0$^+$	E1	
8303	1$^-$	8303 *3*	100	0	0$^+$	E1	
8552	1$^-$	8552 *3*	100	0	0$^+$	E1	
8585	1$^-$	8585 *3*	100	0	0$^+$	E1	
8644	1$^-$	8644 *3*	100	0	0$^+$	E1	
8676	1,2$^+$	8676 *3*	100	0	0$^+$		
8834	1$^-$	8834 *4*	100	0	0$^+$		
8884	1$^-$	8884 *3*	100	0	0$^+$	E1	
8918	1$^-$	8917 *3*	100	0	0$^+$	E1	B(E1)(W.u.)=0.0006 *3*
8946	(11$^-$)	947[‡]		7999	(10$^-$)		
		1258[‡]		7688	(9$^-$)		
9070	(10$^+$)	2269[‡]		6806	(8$^+$)		

From ENSDF

$^{40}_{18}Ar_{22}$-15

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ #	E_f	J_f^π	Mult. @	Comments
9127	1^-	9128 *3*	100	0	0^+	E1	B(E1)(W.u.)=0.00118 *24*
9314	1^-	9313		0	0^+		
9337	1^-	9337 *3*	100	0	0^+		
9355	1^-	5054	7	4301.08	$(3)^-$		
		5436	8	3918.85	2^+		
		9356 *3*	100	0	0^+	E1	
9416	1^-	5333	54	4082.63	3^-		
		5497	40	3918.85	2^+		
		5904	51	3511.54	2^+		
		6891	9	2524.09	2^+		
		7954	31	1460.849	2^+		
		9416 *3*	100	0	0^+	E1	
9450	1^-	5938	23	3511.54	2^+		
		6242	23	3207.93	2^+		
		6557	11	2892.65	4^+	[E3]	
		6925	37	2524.09	2^+		
		7328	34	2120.91	0^+		
		7988	100	1460.849	2^+		
		9449	69	0	0^+		
9504.2	1^-	5585	3	3918.85	2^+		
		7383	2	2120.91	0^+		
		8043	7	1460.849	2^+		
		9503	100	0	0^+	E1	
9583	1^-	5664	12	3918.85	2^+		
		6690	12	2892.65	4^+	[E3]	
		7058	27	2524.09	2^+		
		7461	61	2120.91	0^+		
		8121	44	1460.849	2^+		
		9582 *3*	100	0	0^+	(E1)	
9617	1^-	5698	11	3918.85	2^+		
		5936	4	3680.60	3^-		
		6105	4	3511.54	2^+		
		6409	9	3207.93	2^+		
		6724	7	2892.65	4^+	[E3]	
		7092	15	2524.09	2^+		
		7495	7	2120.91	0^+		
		8155	100	1460.849	2^+		
		9616	67	0	0^+		
9690	$(1^-,2^+)$	5088	26	4602			
		5365	15	4324.5	2^+		
		5771	11	3918.85	2^+		
		6178	11	3511.54	2^+		

From ENSDF

$^{40}_{18}Ar_{22}$-16

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ †	I_γ #	E_f	J_f^π	Mult. @	Comments
9690	$(1^-,2^+)$	6482	9	3207.93	2^+		
		7165	100	2524.09	2^+		
		8228	7	1460.849	2^+		
		9689	6	0	0^+		
9736	1^-	5134	10	4602			
		5817	27	3918.85	2^+		
		6528	23	3207.93	2^+		
		7211	10	2524.09	2^+		
		7614	15	2120.91	0^+		
		8274	23	1460.849	2^+		
		9735	100	0	0^+		
9757	1^+	9757 *3*	100	0	0^+	M1	B(M1)(W.u.)=0.029 *12*
9825	1^-	5906	40	3918.85	2^+		
		6144	36	3680.60	3^-		
		6313	8	3511.54	2^+		
		6617	52	3207.93	2^+		
		7300	68	2524.09	2^+		
		7703	28	2120.91	0^+		
		8363	100	1460.849	2^+		
		9824	68	0	0^+		
9840	1^-	9840 *3*	100	0	0^+		
9851	1^-	6958&	19	2892.65	4^+	[E3]	
		7326	60	2524.09	2^+		
		8389	53	1460.849	2^+		
		9850 *2*	100	0	0^+	E1	
9944	1^-	6025	13	3918.85	2^+		
		7419	61	2524.09	2^+		
		7822	24	2120.91	0^+		
		8482	66	1460.849	2^+		
		9943	100	0	0^+		
9952	1^-	5627	6	4324.5	2^+		
		5910	3	4042	NATURAL		
		6033	3	3918.85	2^+		
		7427	13	2524.09	2^+		
		8490	17	1460.849	2^+		
		9950 *3*	100	0	0^+	E1	
10090	1^-	10090 *3*	100	0	0^+	E1	
10151	1^-	10151 *3*	100	0	0^+	E1	
10179	1^-	10179 *2*	100	0	0^+	E1	
10362	$1,2^+$	10362 *3*	100	0	0^+		
10745	1^-	10745 *3*	100	0	0^+	E1	

From ENSDF

$^{40}_{18}Ar_{22}$-17

Adopted Levels, Gammas (continued)

γ(^{40}Ar) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [#]	E_f	J_f^π	Mult. [@]
10857	1^-	10857 *3*	100	0	0^+	E1
11769	(12^+)	2699 [‡]		9070	(10^+)	

[†] Values with uncertainties are from ^{40}Cl β^- decay if available, otherwise from (γ,γ'), and those without uncertainties are for transitions reported in (α,pγ) up to 6979 level ($\Delta E\gamma$=1-2 keV) and in (α,γ):resonances after 8919 level ($\Delta E\gamma$=3-5 keV) and are taken from level-energy differences by evaluator, unless otherwise noted.

[‡] Observed in ^{26}Mg(^{18}O,2p2nγ) only.

[#] From ^{40}Cl β^- decay if available, otherwise from (α,pγ) up to 6979 level and from (α,γ):resonances after 8919 level, unless otherwise noted.

[@] From (α,pγ) based on measured $\gamma(\theta)$ and γ(lin pol) up to 6979 level, and from (γ,γ') based on polarization asymmetry after that, unless otherwise noted.

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

From ENSDF

$^{40}_{18}Ar_{22}$-18

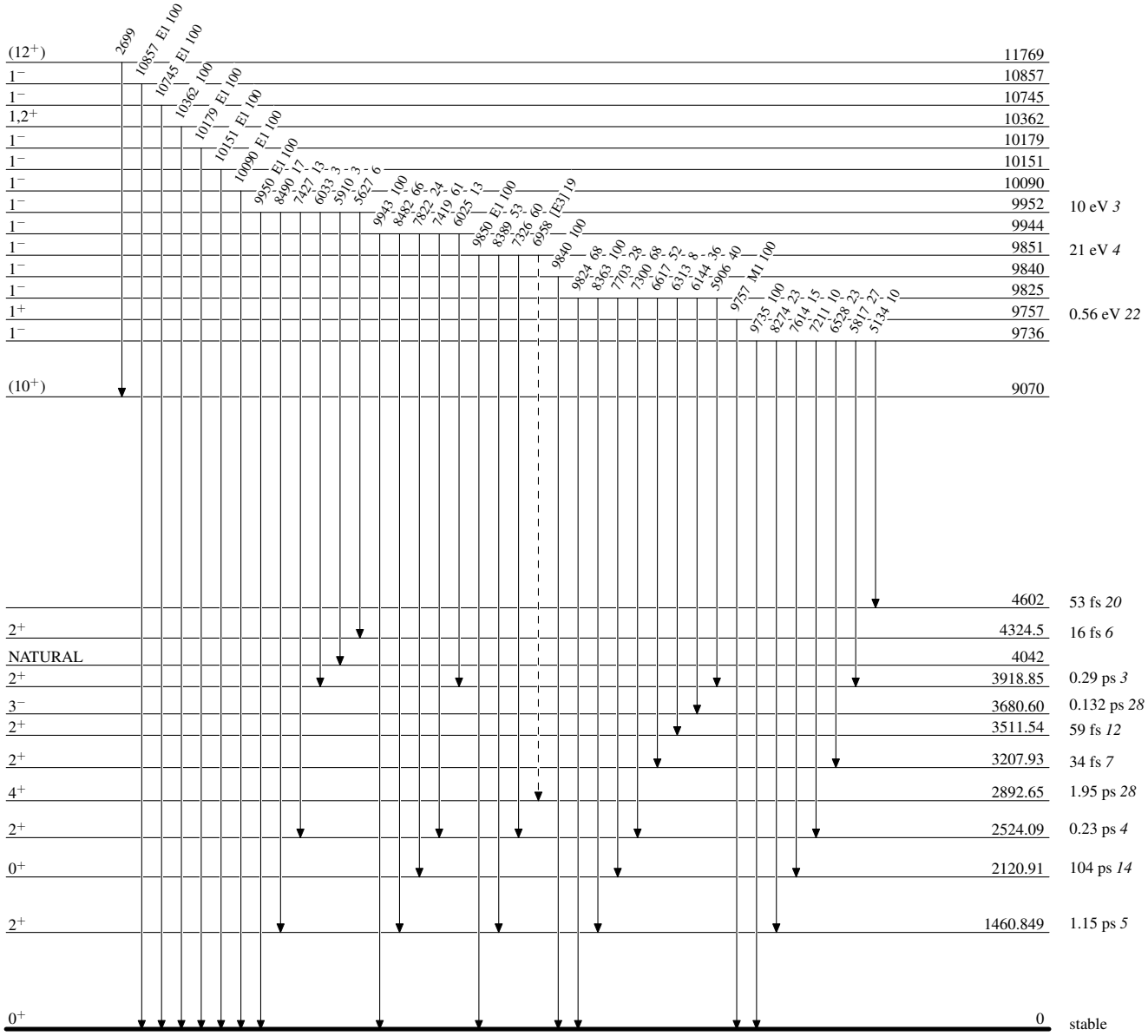
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

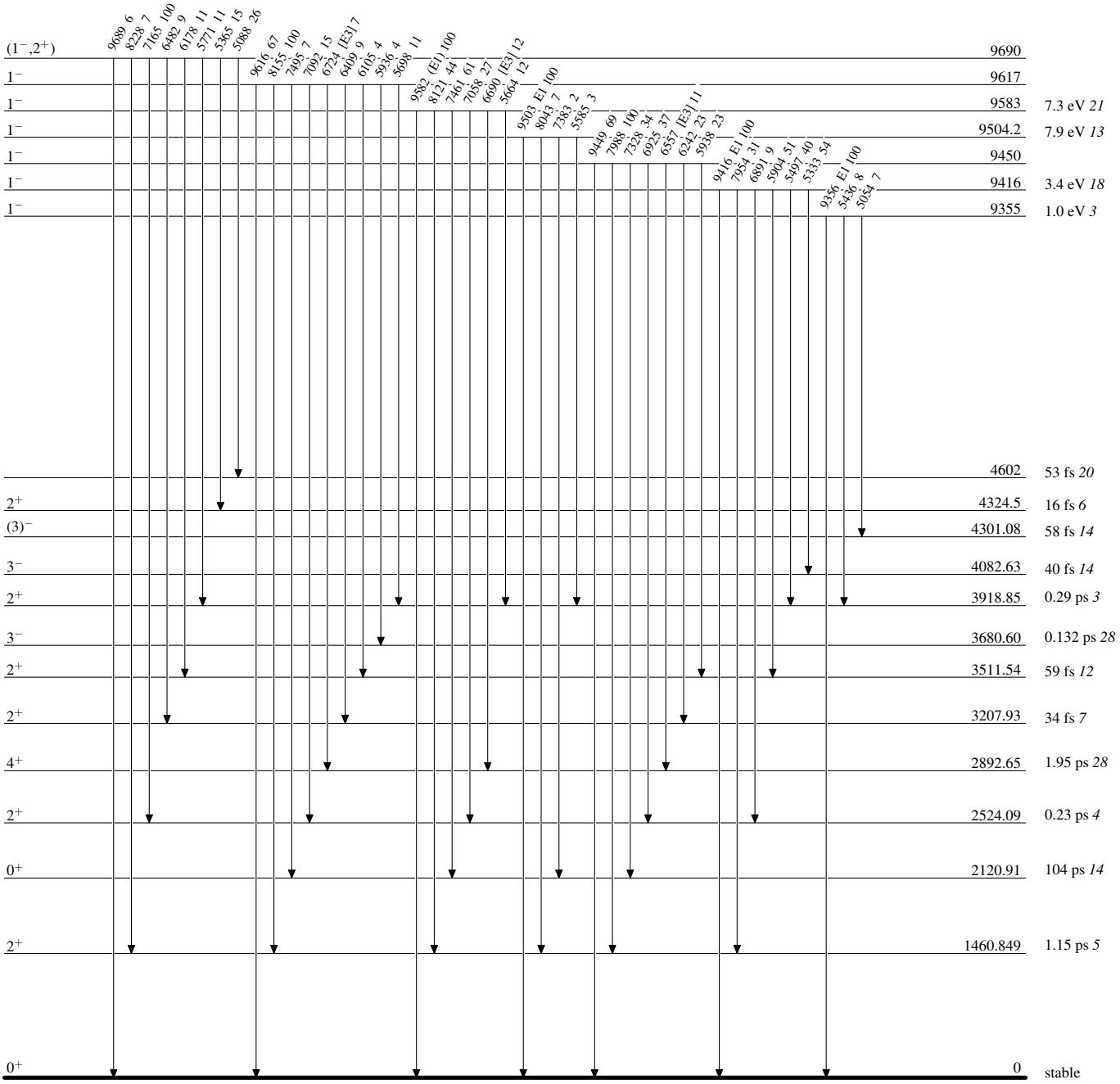


$^{40}_{18}Ar_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{40}_{18}Ar_{22}$

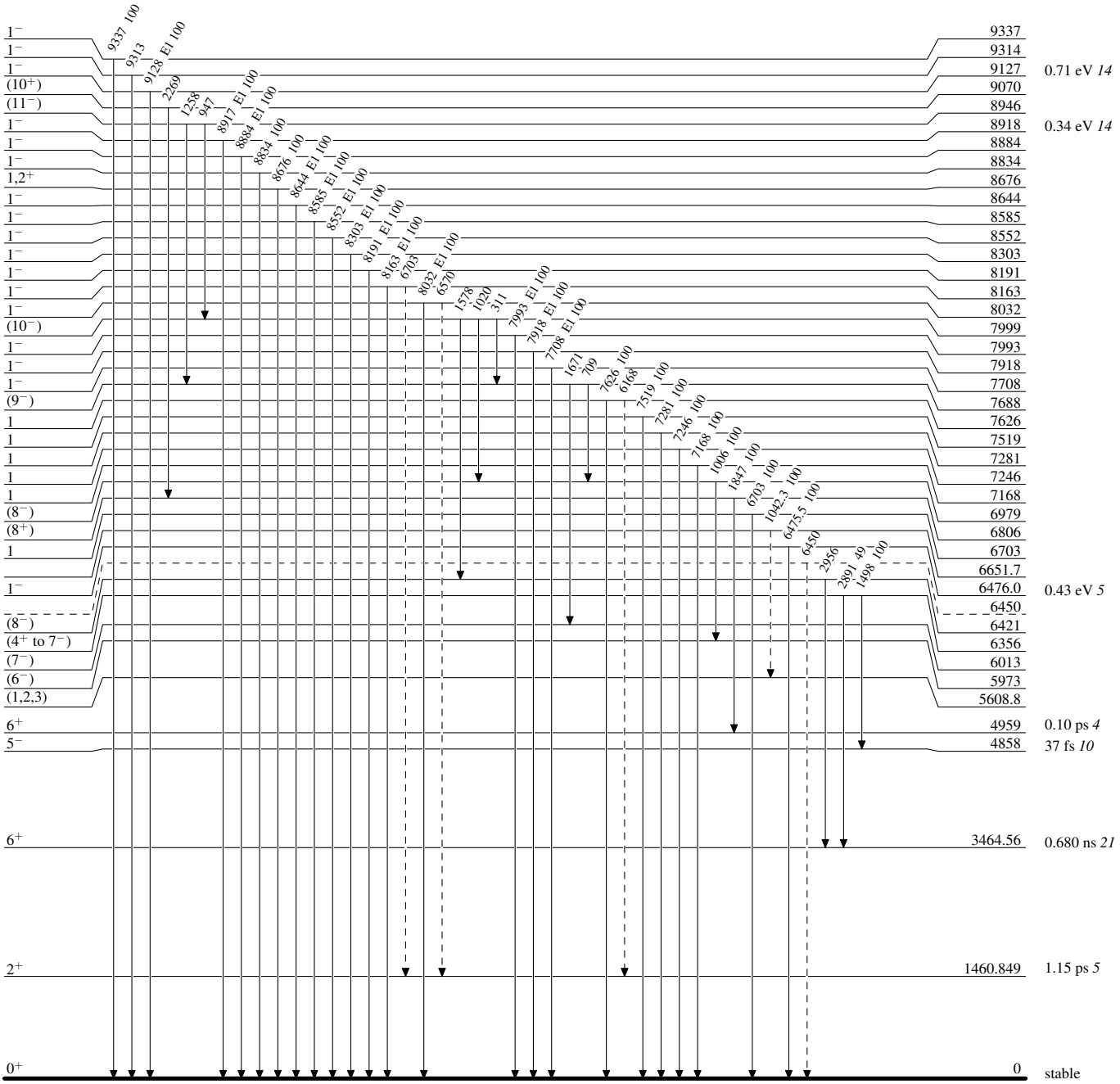
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{40}_{18}Ar_{22}$

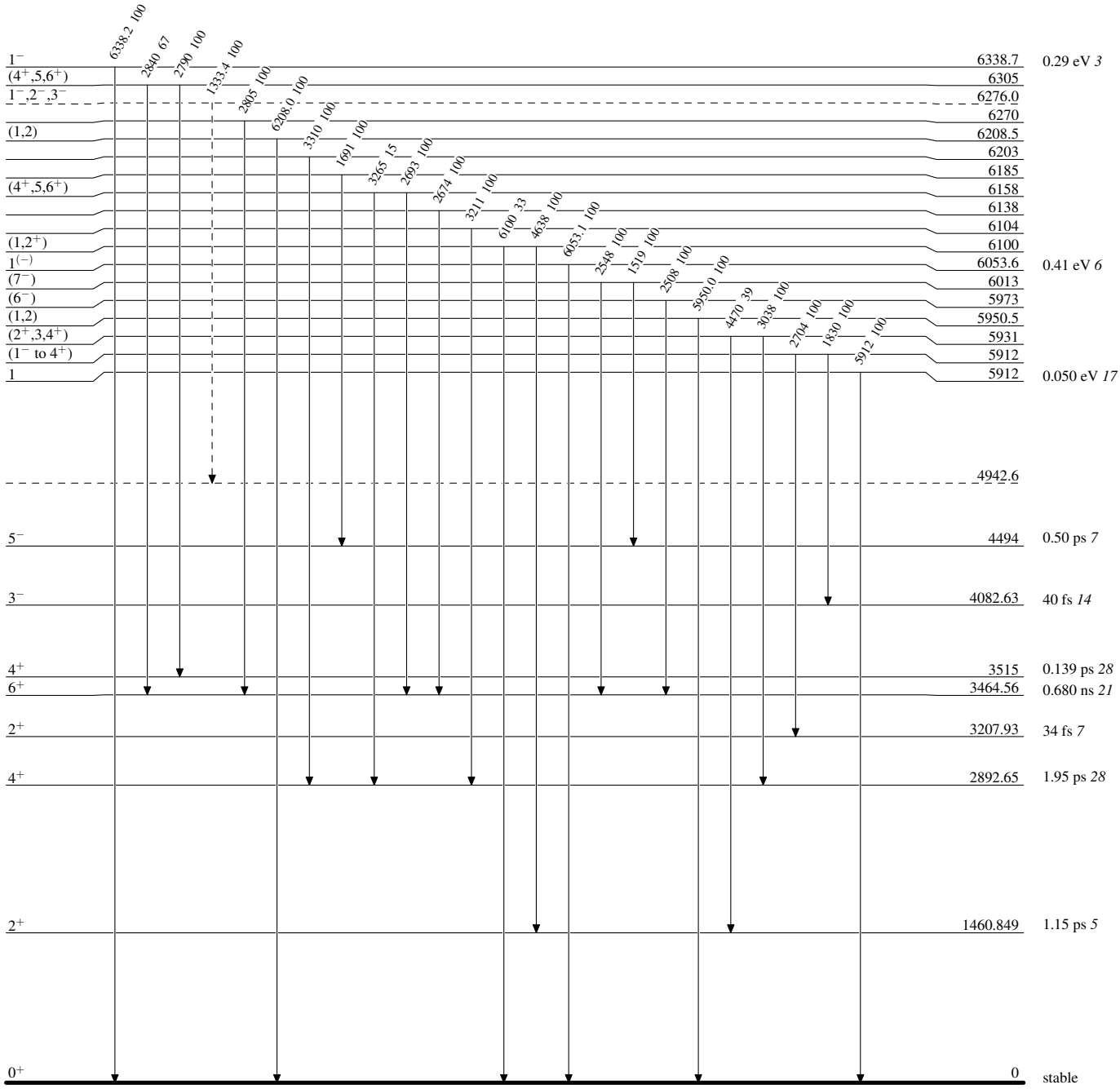
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{40}_{18}Ar_{22}$

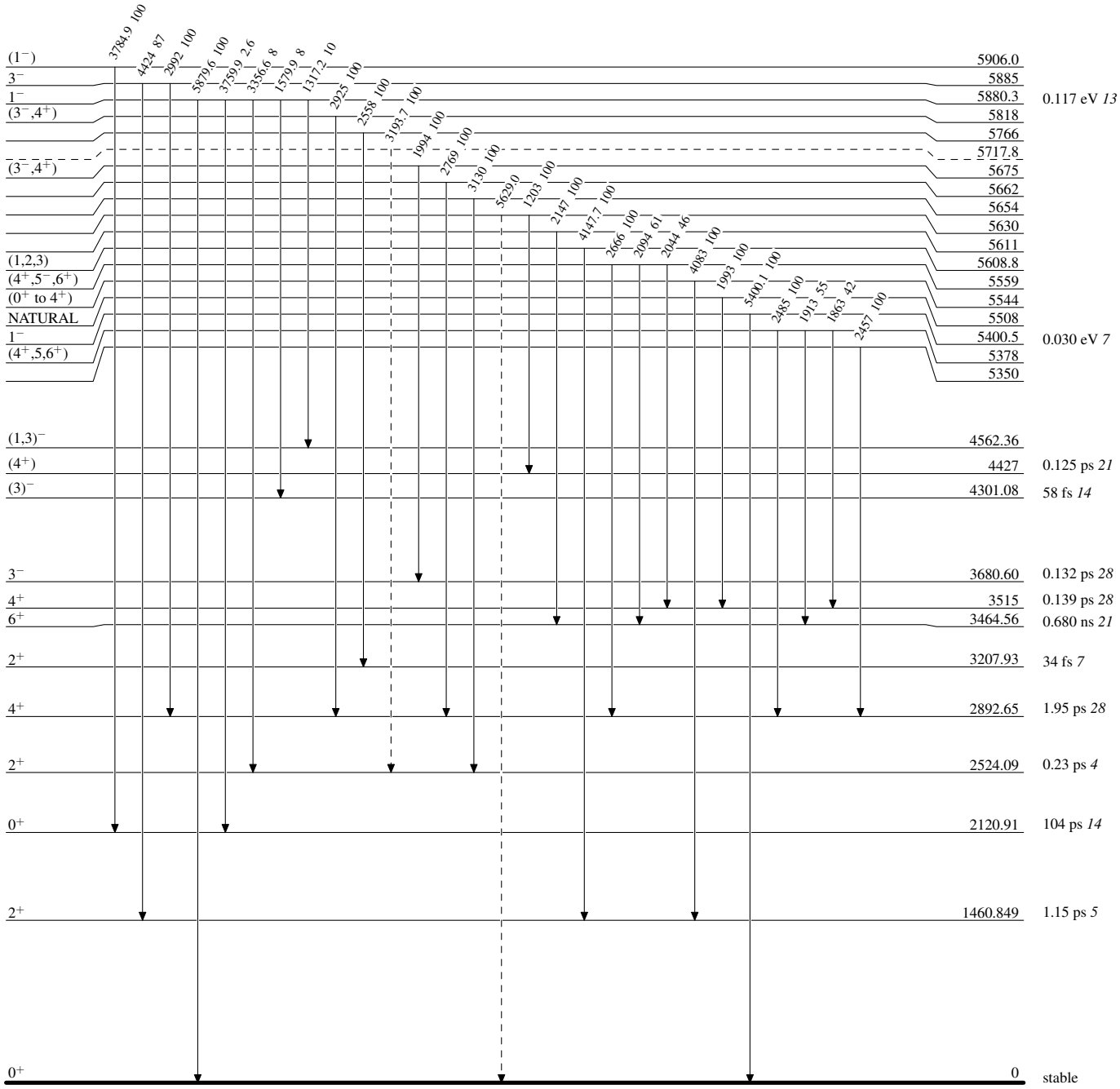
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{40}_{18}Ar_{22}$

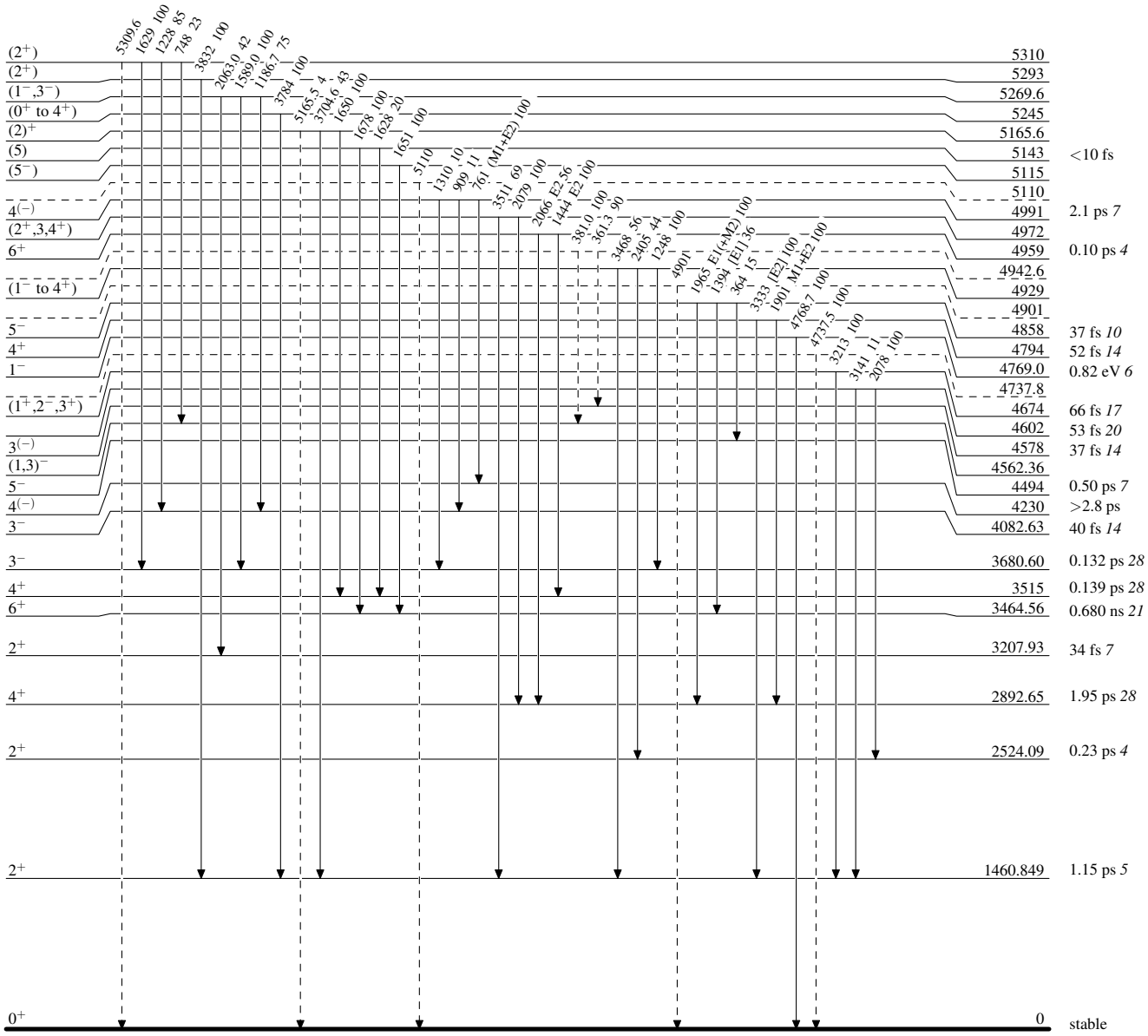
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{40}_{18}Ar_{22}$

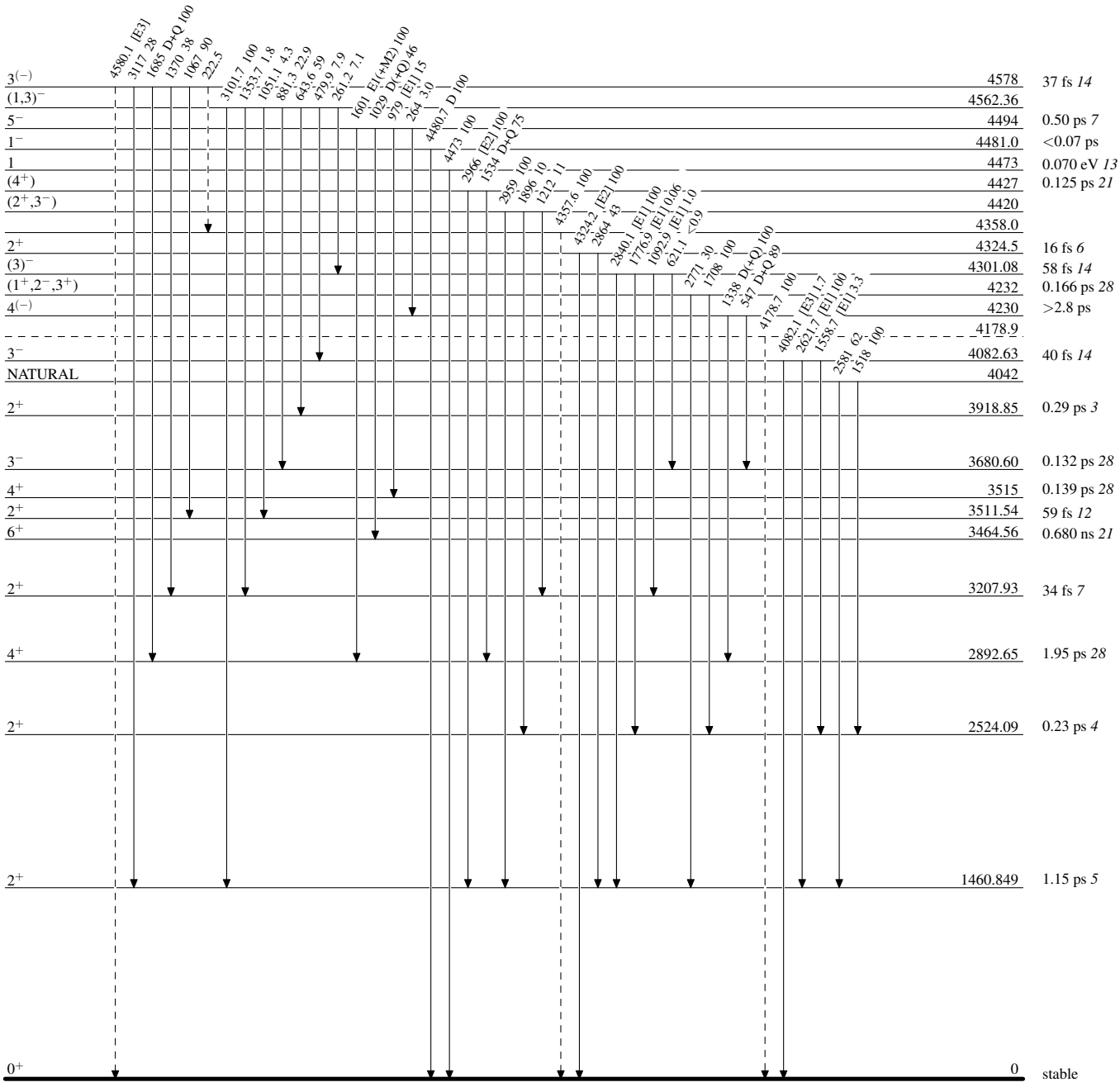
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{40}_{18}Ar_{22}$

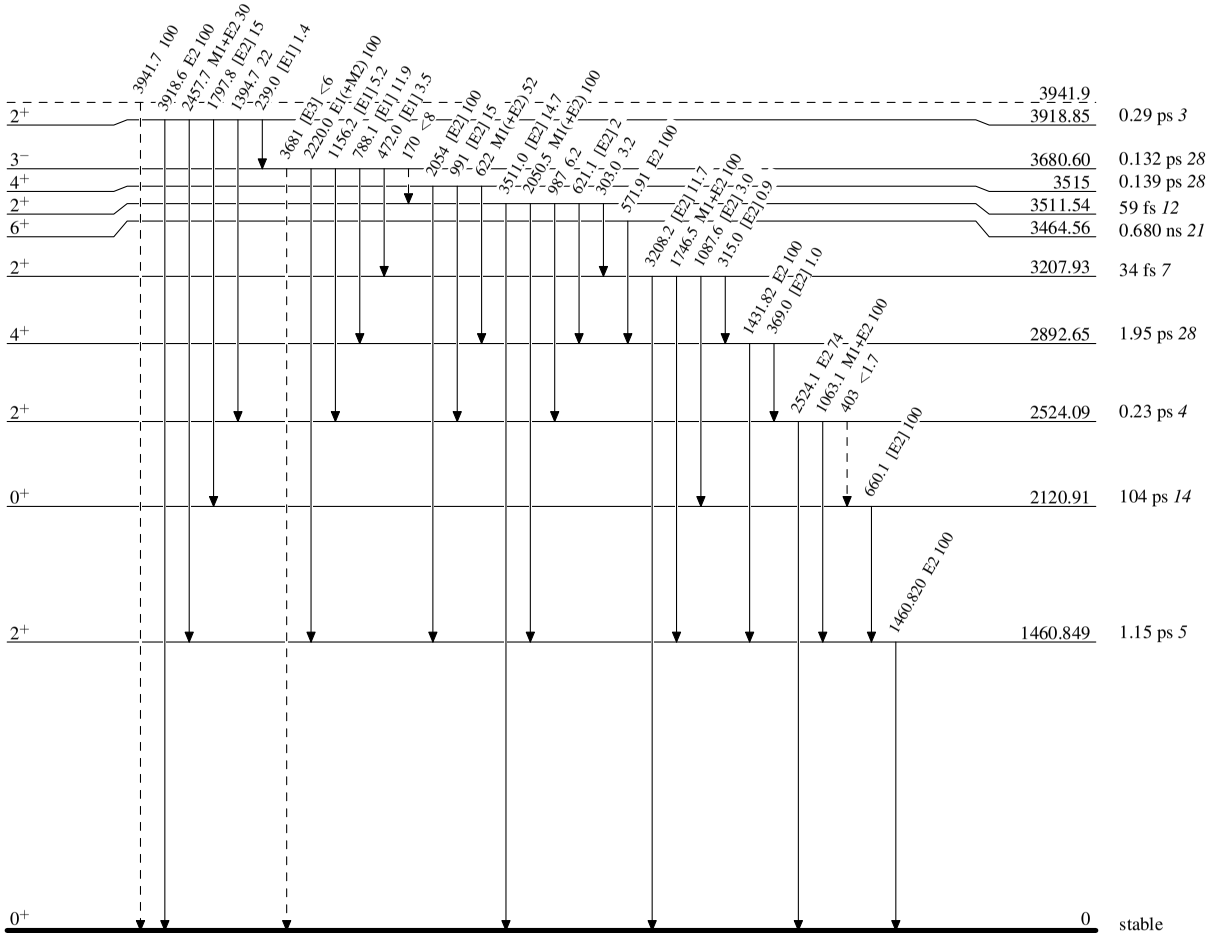
Adopted Levels, Gammas

Legend

Level Scheme (continued)

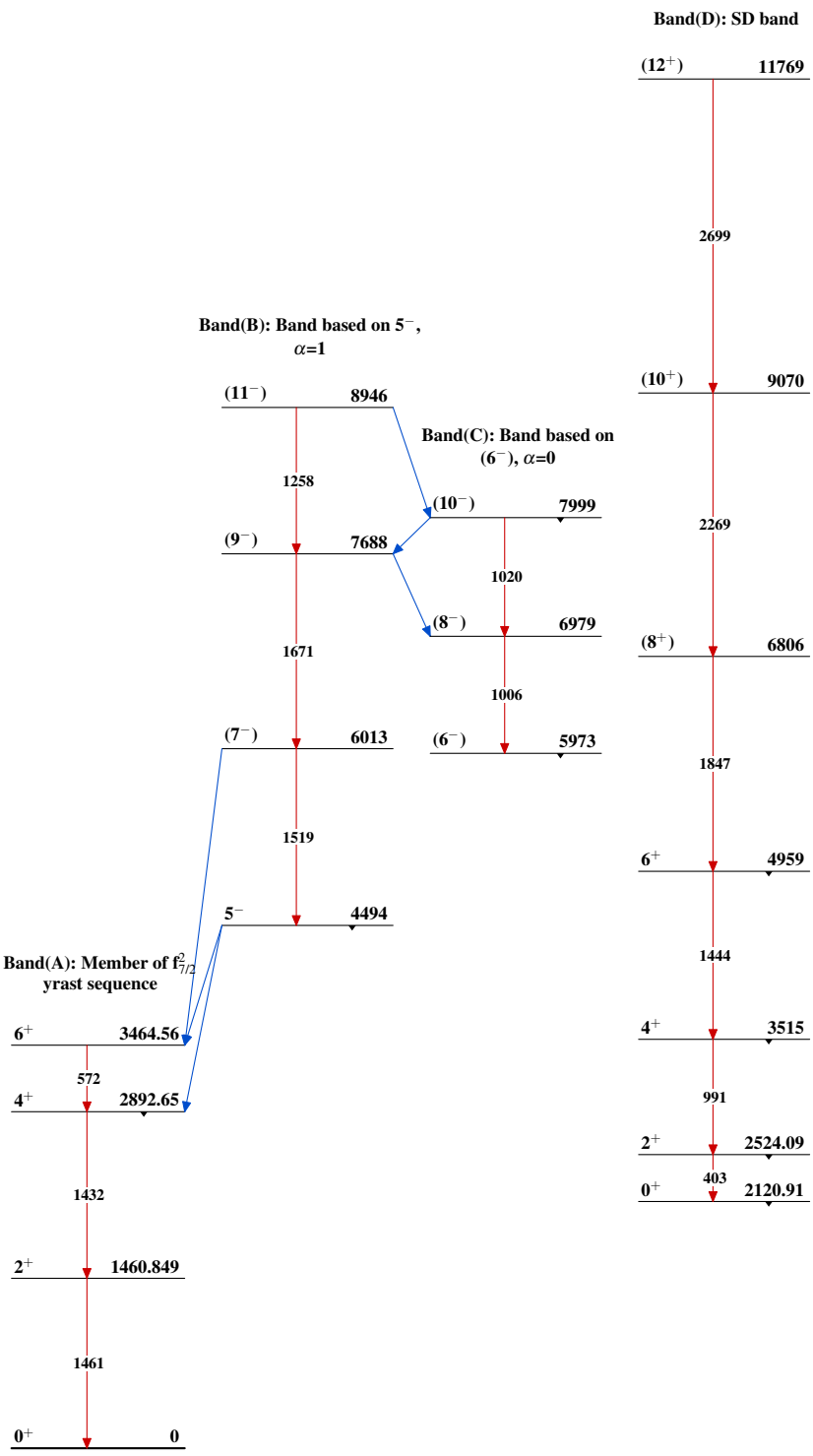
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{40}_{18}Ar_{22}$

Adopted Levels, Gammas



$^{40}_{18}Ar_{22}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

Q(β^-)=599 *6*; S(n)=9426 *6*; S(p)=14400 *70*; Q(α)=−9986 *9* 2012Wa38
S(2n)=15525 *6*, S(2p)=26163 *7* (2012Wa38).
^{42}Ar identified and produced by 1952Ka44 in successive thermal neutron capture in ^{40}Ar, estimated half-life from its decay to ^{42}K.
Mass measurements: mass excess=−34422.7 *58* (2001He29).

^{42}Ar Levels

Cross Reference (XREF) Flags

A	^{42}Cl β^- decay (6.8 s)	D	^{42}Ar(p,p′)
B	^{40}Ar(t,p)	E	^{208}Pb(^{40}Ar,Xγ)
C	^{40}Ar(t,pγ)	F	Pb(^{43}Ar,nγ)

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[@]	XREF	Comments
0.0[&]	0$^+$	32.9 y *11*	ABCDEF	%β^-=100 J$^\pi$: L(t,p)=0. The rms charge radius (<r^2>)$^{1/2}$=3.4354 fm *39* (2013An02 evaluation. d<r^2>(^{38}Ar,^{42}Ar)=+0.2623 fm^2 *12*(stat) *62*(syst) (2008Bl01, also 2005Bl33, laser spectroscopy). T$_{1/2}$: from 1965St09 (β-counting). Others: 1964Ho31, 1952Ka44.
1208.22[&] *13*	2$^+$	2.6 ps *+7−6*	ABCDEF	β_2=0.32 *5* (2001Sc01) J$^\pi$: L(t,p)=2. In a review article by 2008BeZH, Fig. 4 seems to give g factor for the first 2$^+$ states in ^{38,40,42}Ar, but from Fig. 3 in 2006Sp01 (reference 18 in 2008BeZH), the isotopes should be ^{36,38,40}Ar, instead. It would seem that the x-axis in 2008BeZH is erroneously marked in neutron number.
2413.8[&] *6*	(4$^+$)		ABC EF	J$^\pi$: L(t,p)=3,4; γ from (6$^+$) supports 4$^+$. Measured upper limit of branching is <10 for transition to g.s.
2485.9 *3*	2$^+$	0.28 ps *11*	A C E	J$^\pi$: E2 γ to 0$^+$.
2512.5 *4*	(0$^+$ to 4$^+$)	2.8 ps *+21−8*	ABC	J$^\pi$: γ to 2$^+$ and RUL. Measured upper limit of branching is <10 for transition to g.s.
3013.7 *3*	(1,2$^+$)	<83 fs	A C	J$^\pi$: γ to 0$^+$.
3096.1 *5*	4$^+$	>3.5 ps	ABC E	J$^\pi$: ΔJ=2, E2(+M3) γ to 2$^+$; L(t,p)=3,4. Measured upper limit of branching is <5 for transition to g.s. (1973Pr10).
3557.9 *4*	2$^+$	<62 fs	ABC	J$^\pi$: γ to 0$^+$, ΔJ=0, dipole γ to 2$^+$.
3564.3[&] *6*	(6$^+$)		E	J$^\pi$: proposed by 2011Sz02 as the members of the 2$^+$, 4$^+$ and 6$^+$ yrast sequence and from comparison with shell model calculations as well.
3705 *10*	(2$^+$)		B	J$^\pi$: L(t,p)=(2).
3820 *20*			AB	XREF: A(3846). E(level): possible γ to g.s. and 1208 level from a 3846 level in ^{42}Cl β^-.
4005.3 *4*	2$^+$	0.23 ps *6*	BC	J$^\pi$,E(level): L=2 for 4012 level in (t,p) which is considered as associated with 4005.3 level in (t,pγ). It is possible part of this level may also correspond to 4013.6 level populated in β^- decay.
4013.6 *8*			A	See comment for 4005.3 level for possible population in (t,p).
4045.8 *4*			A	
4127.5 *5*	(0$^+$,1,2)	0.97 ps *21*	ABC	J$^\pi$: $\gamma(\theta)$ of γ to 2$^+$. Measured upper limit of branching is <5% for transition to g.s.
4287.1 *5*	(1,2,3)	<35 fs	BC	J$^\pi$: γ to 2$^+$; $\gamma(\theta)$.
4405 *5*	3$^-$,4$^+$		B	J$^\pi$: L(t,p)=3,4.
4417.3 *3*			A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{42}Ar Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[@]	XREF	Comments
4633.9 *6*	(3^-)	<35 fs	ABC	Jπ: L(t,p)=(3,4); ΔJ=1 γ to 2^+.
4887 *10*	(3^-,4^+)		B	Jπ: L(t,p)=(3,4).
4896 *10*	(3^-,4^+)		AB	Jπ: L(t,p)=(3,4). E(level): possible 4902γ to g.s. from a tentative 4902 level in ^{42}Cl β^- may correspond to this level, but γ to 0^+ is inconsistent with J^π=(3^-,4^+).
5000 *15*			AB	E(level): possible γ to g.s. from a 5015 level in ^{42}Cl β^-.
5230 *15*			B	
5292 *15*			AB	E(level): possible 1284γ to 4013 level from a 5297 level in ^{42}Cl β^-.
5553 *15*	2^+		B	Jπ: L(t,p)=2.
5763 *15*			B	
5945 *20*			B	
6090 *20*			B	
6170 *15*			B	
6357 *15*			B	
6490 *20*			B	
6614 *20*			B	
6742 *15*			B	
6880 *30*			B	
7060 *20*			B	
7140 *20*			B	
7275 *15*			B	
7355 *15*			B	
7540 *30*			B	
7630[‡] *30*			AB	
7793 *15*			B	
7987 *15*			B	
8080 *30*			B	
8230 *30*			B	
8380 *20*			B	
8520 *20*			B	
8690 *20*			B	
8790 *20*			B	
8940 *30*			B	
9020 *30*			B	
9130 *30*			B	
9210 *20*			B	
9320 *30*			B	
9410 *30*			B	
9535 *25*			B	
9640 *30*			B	
9820 *20*			B	
9905 *20*			B	
10015 *20*			B	
10060 *30*			B	
10140 *30*			B	
10300 *30*			B	
10540 *30*			B	
10590 *30*			B	
10670 *30*			B	
10850 *30*			B	

[†] From adopted Eγ data when measured γ-ray energies are available. In other cases weighted averages are taken of values available from different reactions.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{42}Ar Levels (continued)

‡ Possible γ to g.s. from a 7648 level in ^{42}Cl β^-.
# In (t,p) transfer reaction, target ^{40}Ar $J^\pi=0^+$.
@ From DSAM in (t,pγ), unless otherwise noted.
& Band(A): Yrast sequence (2011Sz02).

$\gamma(^{42}Ar)$

E_i(level)	J_i^π	E_γ†	I_γ‡	E_f	J_f^π	Mult.@	δ@	Comments
1208.22	2^+	1208.17 *13*	100	0.0	0^+	E2		B(E2)(W.u.)=9.8 *+29−21*
2413.8	(4^+)	1205.6 *5*	100	1208.22	2^+			
2485.9	2^+	1277.7 *3*	100# *4*	1208.22	2^+			
		2486.1 *8*	15.5# *25*	0.0	0^+	E2		B(E2)(W.u.)=0.33 *14*
2512.5	$(0^+$ to $4^+)$	1304.3 *3*	100	1208.22	2^+			
3013.7	$(1,2^+)$	1806.2 *4*	100 *7*	1208.22	2^+			
		3014.6 *8*	61 *7*	0.0	0^+			
3096.1	4^+	1887.8 *4*	100	1208.22	2^+	E2(+M3)	+0.07 *8*	B(E2)(W.u.)<0.76
3557.9	2^+	2349.6 *3*	100 *2*	1208.22	2^+	D(+Q)	0.00 *7*	
		3557.7	11 *2*	0.0	0^+	[E2]		B(E2)(W.u.)>0.18
3564.3	(6^+)	1150.4 *3*		2413.8	(4^+)			
4005.3	2^+	991.6		3013.7	$(1,2^+)$			
		1519.40 *22*		2485.9	2^+			
		2797.0		1208.22	2^+			
4013.6		1527.7		2485.9	2^+			
		1598.5& *8*	25 *4*	2413.8	(4^+)			
		2805.3 *7*	100 *8*	1208.22	2^+			
		4013.4		0.0	0^+			
4045.8		1560.1 *5*	32.6 *21*	2485.9	2^+			
		2837.3 *5*	100 *4*	1208.22	2^+			
		4045.6		0.0	0^+			
4127.5	$(0^+,1,2)$	1641.6		2485.9	2^+			
		2919.2 *4*	100	1208.22	2^+			
4287.1	(1,2,3)	3078.8 *4*		1208.22	2^+			
4417.3		403.9& *6*	8.4 *19*	4013.6				
		1404.7 *4*	15 *3*	3013.7	$(1,2^+)$			
		1931.7 *6*	41 *4*	2485.9	2^+			
		2003.4& *3*	21 *4*	2413.8	(4^+)			
		3208.3 *3*	100 *4*	1208.22	2^+			
4633.9	(3^-)	3425.5 *5*	100	1208.22	2^+	D		

† Values with uncertainties from (t,pγ), β^- decay or (^{40}Ar,Xγ). Weighted averages are taken when available. Others are from level energy differences.
‡ From (t,pγ), when a level is populated in β^- decay and in (t,pγ) and others from β^- decay, unless otherwise noted.
# From β^- decay.
@ From (t,pγ).
& Placement of transition in the level scheme is uncertain.

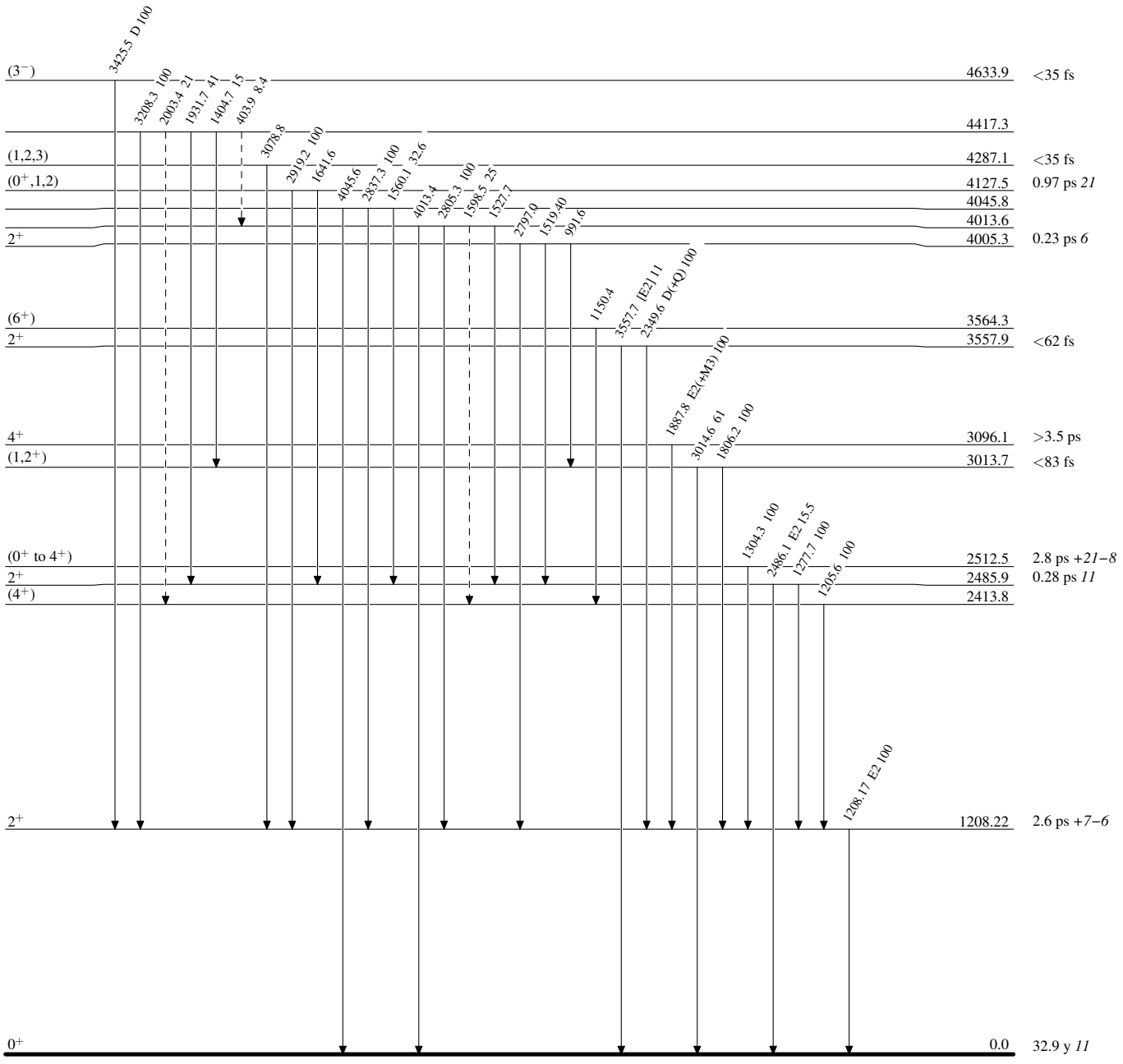
Adopted Levels, Gammas

Legend

Level Scheme

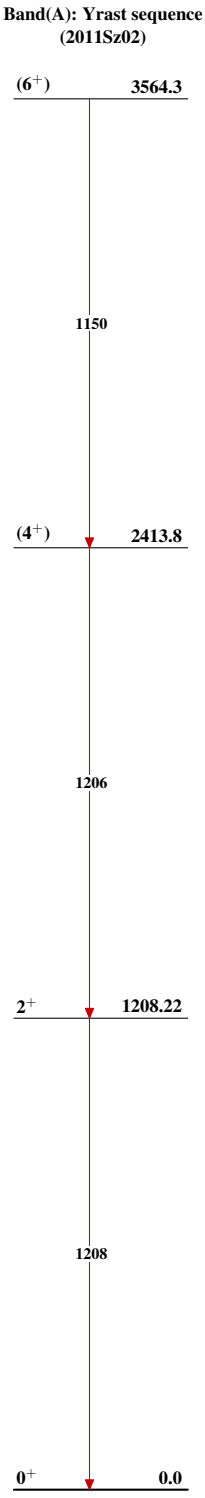
Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{42}_{18}Ar_{24}$

Adopted Levels, Gammas



$^{42}_{18}Ar_{24}$