Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 188,1 (2023)	17-Jan-2023

Q(β^-)=−4747 *5*; S(n)=11631 *4*; S(p)=4620 *4*; Q(α)=−3439 *4* 2021Wa16
Q(ε)=2013 *4*, S(2n)=20920 *30*, S(2p)=13143 *4* (2021Wa16).
^{71}As possibly identified in ^{70}Ge(d,n) reaction by 1939Sa02 (also 1941Sa01) with an approximate half-life of 50 h.
1948Mc31: possible identification in ^{70}Ge(d,n) with $T_{1/2}$=2.08 d.
1950Me55: ^{71}As produced in ^{69}Ga(α,2n),E=23 MeV.
1950Ho26: ^{71}As produced in ^{69}Ga(α,2n), measured half-life.
^{71}As produced in ^{70}Ge(d,n),E=18 MeV by 1952Br90.
1954Th36: production of ^{71}As in ^{70}Ge(d,n),E=25 MeV, $T_{1/2}$.
1955Gr08: production of ^{71}As in ^{70}Ge(d,n),E=11.5 MeV, $T_{1/2}$.
Additional information 1.
Theoretical calculations:
2022No04: calculated single-particle energies, occupation probabilities, levels, J^π, B(E2), B(M1), magnetic dipole and electric quadrupole moments using constrained self-consistent mean-field (SCMF) method based on the universal relativistic functional DD-PC1.
2015Ka46: calculated binding energies, level energies of low-lying, low spin states , B(E2) values in odd-A isotopes using shell-model with a pairing-plus-multipole Hamiltonian and monopole-based universal force interaction (PMMU model) for the $pf_{5/2}g_{9/2}$ shell nuclei.
2013Ve10: calculated yrast states, shell evolution, rotational alignments, B(E2) versus spin using projected shell model with deformed single-particle states from the Nilsson potential.
2004Br44: calculated β-decay rates for ^{71}As decay using proton-neutron interacting boson-fermion model.
1976To05: calculated levels, B(λ) using asymmetric rotor model.

^{71}As Levels

Q(transition) values are from (^{19}F,α2pγ) (1994Zi01), unless otherwise noted.

Cross Reference (XREF) Flags

A	^{71}Se ε decay (4.74 min)	E	^{69}Ga(α,2nγ),^{61}Ni(^{12}C,pnγ),	I	^{72}Ge(p,2nγ)
B	^{54}Fe(^{23}Na,α2pγ)	F	^{70}Ge(p,γ)	J	^{76}Se(μ^-,5nγ)
C	^{58}Ni(^{16}O,3pγ)	G	^{70}Ge(p,p),(p,p′γ)		
D	^{58}Ni(^{19}F,α2pγ)	H	^{70}Ge(^{3}He,d),(^{3}He,dγ)		

E(level)†	J^π	$T_{1/2}$#	XREF	Comments
0.0	5/2⁻	65.30 h *7*	ABCDEF HIJ	%ε+%β⁺=100 μ=+1.673 *2* (1976He06,2019StZV) Q=−0.021 *6* (1988Wh03,2016St14,2021StZZ) μ: nuclear magnetic resonance on oriented nuclei (1976He06, 1976He25). Other: 1.64 *4* (atomic-beam magnetic resonance,1980Ho02). Q: from Q(^{71}As)/Q(^{72}As)=+0.25 *1* (1988Wh03), nuclear orientation with γ ray measurements. J^π: L(^{3}He,d)=3 from 0⁺; log *ft*=5.9 to 175, 3/2⁻ states in ^{71}Ge. $T_{1/2}$: from timing of γ rays (1990Me01). Others: 61 h *2* (1971Mu14), 64.8 h *7* (1959Re24), 60 h 3 (1957Be46), 62 h 3 (1955Gr08), 65 h 5 (1954Th36), 59.5 h *20* (1953St31,timing of conversion electrons), 60 h (1950Ho26). The weighted average of all the values is 65.28 h 12 with reduced χ^2=3.0.
143.52 *6*	(1/2)⁻	59 ns *10*	A f hI	J^π: E2 γ to 5/2⁻; L(^{3}He,d)=1 for 143+147 doublet. Interacting fermion boson mode calculations (2004Br44) predict 3/2 and 1/2 doublet in close proximity to

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Adopted Levels, Gammas (continued)

^{71}As Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[#]	XREF	Comments
				5/2 g.s.. $T_{1/2}$: from $\gamma\gamma$(t) in (p,2nγ) (1980Te01).
147.44 *4*	(3/2)$^-$	0.85 ns *25*	ABCDEf hI	J^π: ΔJ=1, M1 γ to 5/2$^-$; L(^{3}He,d)=1 for 143+147 doublet. Interacting fermion boson mode calculations (2004Br44) predict 3/2 and 1/2 lying close to 5/2 g.s.. The qp-phonon model calculations of 2003Ho02 predict first excited state of 3/2$^-$ at 120 keV. $T_{1/2}$: from $\gamma\gamma$(t), centroid-shift method in ^{60}Ni(160,apg) (1985An23). Other: <2 ns in (p,2nγ) (1980Te01).
506.18 *8*	(3/2)$^-$		A EF H	XREF: F(510)H(510). J^π: L(^{3}He,d)=1 from 0$^+$; log *ft*=7.2 from (5/2$^-$).
828.63 *13*	(3/2)$^-$		A F HI	J^π: L(^{3}He,d)=1 from 0$^+$; log *ft*=7.0 from (5/2$^-$).
870.32 *6*	(5/2)$^-$		AB EF HI	J^π: L(^{3}He,d)=3 from 0$^+$; γ to (1/2)$^-$.
924.58 *6*	(7/2$^-$)	2.1 ps *17*	ABCDEF I	J^π: 924.6γ ΔJ=1 to 5/2$^-$; excitation function in in-beam γ-ray study favors 7/2. $T_{1/2}$: from DSAM in (α,2nγ),(^{12}C,pnγ).
978.06 *10*	(3/2$^-$,5/2$^-$)		A E I	J^π: log *ft*=5.7 from (5/2$^-$); γ to (1/2)$^-$.
990.57 *6*	(3/2,5/2$^-$)		A EF	J^π: log *ft*=6.3 (log $f^{1u}t$<8.3) from (5/2$^-$); γ to (1/2)$^-$.
1000.21[@] *12*	9/2$^+$	19.8 ns *3*	AB DE hI	μ=+5.13 *9* (1971BeWR,2020StZV) XREF: h(1004). μ: g factor=+1.14 *2* (1971BeWR,time-dependent perturbed angular distribution method, TDPAD). Value of +5.15 *9* in 1971BeWR re−evaluated to +5.13 *9* in 2020StZV. J^π: L(^{3}He,d)=1+4 for 1000+1007 doublet; ΔJ=2, quadrupole γ to 5/2$^-$ from $\gamma\gamma(\theta)$(DCO) in (^{19}F,α2pγ). $T_{1/2}$: γ(t) in ^{70}Ge(d,nγ) (1971BeWR).
1007 *5*	1/2$^-$,3/2$^-$		F h	XREF: h(1004). E(level): from (p,γ). Other: 1004 *7* from (^{3}He,d). J^π: from L=1+4 in (^{3}He,d) for 1000+1007 doublet.
1129.36 *17*	3/2$^+$,5/2$^+$	≤2.1 ps	A DE HI	XREF: H(1138). J^π: L(^{3}He,d)=2 from 0$^+$. $T_{1/2}$: from DSAM in (α,2nγ),(^{12}C,pnγ).
1242.64 *4*	(3/2$^-$,5/2$^-$)		A EF I	J^π: log *ft*=5.2 from (5/2$^-$) parent; 1098.8γ to (1/2)$^-$. Other: (7/2$^-$) proposed in (α,2nγ) is inconsistent.
1245.31[b] *22*	(5/2$^-$)		BC	J^π: ΔJ=(1) γ to (3/2)$^-$; band assignment.
1264 *7*	(5/2$^-$,7/2$^-$)		H	J^π: L(^{3}He,d)=(3).
1284.79 *16*			A	
1339.54? *20*	(9/2$^-$)	0.55 ns *17*	E	Additional information 2. J^π: proposed in (α,2nγ) based on γ-decay pattern. $T_{1/2}$: from RDM in (α,2nγ),(^{12}C,pnγ).
1394.69 *12*	(9/2)$^-$	>1.4 ps	BCD I	J^π: ΔJ=2, E2 γ to 5/2$^-$. $T_{1/2}$: from DSAM in (^{19}F,α2pγ). γ to 1000.2 level was not seen in (^{19}F,α2pγ), Iγ<2%.
1412.71 *7*	1/2$^-$,3/2$^-$		A F H	XREF: H(1422). J^π: L(^{3}He,d)=1.
1443.12 *6*	(3/2,5/2$^-$)		A	J^π: log *ft*=6.2 from (5/2$^-$); γ to (1/2)$^-$.
1463.08 *7*	(3/2,5/2$^-$)		A f	XREF: f(1467). J^π: log *ft*=6.6 from (5/2$^-$); γ to (1/2)$^-$.
1468.26[a] *18*	(7/2$^-$)		B f	XREF: f(1467). J^π: D+Q γ to 5/2$^-$; band assignment.
1471.22 *12*			A f	XREF: f(1467).
1488 *4*			F	
1534 *4*	1/2$^+$		F H	J^π: L(^{3}He,d)=0.
1609 *5*	1/2$^-$,3/2$^-$		F H	J^π: L(^{3}He,d)=1.

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Adopted Levels, Gammas (continued)

^{71}As Levels (continued)

E(level)[†]	J$^{\pi}$	$T_{1/2}$[#]	XREF	Comments
1615.67 *9*	(3/2,5/2,7/2$^-$)		A I	J$^{\pi}$: γ to 3/2$^-$; log $f^{1u}t$<8.5 from (5/2$^-$).
1714.19[@] *13*	13/2$^+$	4.0 ps *4*	B DE I	J$^{\pi}$: ΔJ=2, E2 γ to 9/2$^+$; 13/2 from excitation function in (α,2nγ); band assignment. $T_{1/2}$: from (α,2nγ). Other: 4.3 ps *14* from (^{23}Na,α2pγ). Q(transition)=1.90 +*11*−*9* (1994Zi01).
1728.81[d] *19*	(7/2$^-$)		BCD	J$^{\pi}$: 483.6γ ΔJ=1 to 5/2$^-$; band member.
1751.72 *7*	(3/2,5/2$^-$)		A	J$^{\pi}$: log *ft*=6.3 from (5/2$^-$); γ to (1/2)$^-$.
1759.2 *3*	(7/2$^-$)		BC	J$^{\pi}$: γ to (5/2$^-$); yrast-pattern of population in heavy-ion reactions.
1798.14[b] *12*	(9/2$^-$)		BCD	J$^{\pi}$: ΔJ=1, D+Q γ to (7/2$^-$); ΔJ=(2), (Q) γ to (5/2$^-$).
1816.8 *3*			D	J$^{\pi}$: γ to 3/2$^+$,5/2$^+$ suggests 5/2,7/2,9/2$^+$.
1904.37 *20*	(11/2)$^+$	2.1 ps *14*	DE	J$^{\pi}$: ΔJ=1, M1+E2 γ to 9/2$^+$. $T_{1/2}$: from DSAM in (α,2nγ),(^{12}C,pnγ). Other: >1.4 ps from (^{19}F,α2pγ).
1974 *5*	7/2$^+$,9/2$^+$		F H	E(level): weighted average of 1974 *5* from (p,γ) and 1972 *7* from (^{3}He,d). J$^{\pi}$: L(^{3}He,d)=4.
1981.59 *5*	(3/2$^-$,5/2$^-$,7/2$^-$)		A	J$^{\pi}$: log *ft*=5.8 from (5/2$^-$).
2061.89[e] *24*	(9/2$^-$)		BC	J$^{\pi}$: ΔJ=1, D γ to (7/2$^-$); band assignment.
2100.27 *22*			E	
2110.79[a] *13*	(11/2$^-$)		BCD	J$^{\pi}$: ΔJ=2, Q to (7/2$^-$); ΔJ=1, D+Q γ to (9/2$^-$).
2166 *10*	3/2$^+$,5/2$^+$		H	J$^{\pi}$: L(^{3}He,d)=2.
2305 *10*	3/2$^+$,5/2$^+$		H	J$^{\pi}$: L(^{3}He,d)=2.
2360 *5*			F	
2369.95 *17*	(3/2,5/2,7/2)		A	J$^{\pi}$: log $f^{1u}t$<8.5 from (5/2$^-$).
2416.09 *20*	(13/2$^+$)		D	J$^{\pi}$: ΔJ=0, D+Q γ to 13/2$^+$; ΔJ=(2), (Q) γ to 9/2$^+$.
2416.61[d] *23*	(11/2$^-$)		BC	J$^{\pi}$: ΔJ=1, D γ to (9/2$^-$); band assignment.
2429.23 *9*	(3/2$^-$,5/2$^-$)		A H	XREF: H(2441). J$^{\pi}$: log *ft*=5.8 from (5/2$^-$); γ to (1/2)$^-$.
2469.92[b] *12*	(13/2$^-$)	>1.4 ps	BCD	J$^{\pi}$: ΔJ=2, (E2) γ to 9/2$^-$; band assignment. $T_{1/2}$: from DSAM in (^{19}F,α2pγ) and in (^{23}Na,α2pγ). Q_t<0.98 or <2.0 from (^{19}F,α2pγ).
2488 *5*			F	
2506.91 *12*	(3/2,5/2,7/2$^-$)		A	J$^{\pi}$: γ to 3/2$^-$; log $f^{1u}t$<8.5 from (5/2$^-$).
2526 *10*			h	
2657 *5*	3/2$^+$,5/2$^+$		F H	XREF: H(2674). E(level): weighted average of 2657 *5* from (p,γ) and 2674 *10* from (^{3}He,d). J$^{\pi}$: L(^{3}He,d)=2.
2689.12[@] *16*	17/2$^+$	0.53 ps *15*	B DE	J$^{\pi}$: ΔJ=2, E2 γ to 13/2$^+$; band assignment. $T_{1/2}$: weighted average of 0.53 ps +*51*−*19* from (^{23}Na,α2pγ), 0.48 ps *15* from (^{19}F,α2pγ), and 0.62 ps *21* from (α,2nγ). Q_t=2.2 +*5*−*3*.
2748.6 *3*	(13/2$^+$)		DE	J$^{\pi}$: ΔJ=1, D+Q γ to (11/2$^+$).
2793.12 *16*	(15/2$^+$)	≤21 ps	DE	J$^{\pi}$: ΔJ=1, (M1+E2) γ to 13/2$^+$. $T_{1/2}$: from RDM in (α,2nγ),(^{12}C,pnγ). Other: >1.4 ps from DSAM in (^{19}F,α2pγ).
2803 *10*	1/2$^+$		H	J$^{\pi}$: L(^{3}He,d)=0.
2820.1[e] *3*	(13/2$^-$)	>1.4 ps	BC	J$^{\pi}$: ΔJ=2, Q γ to (9/2$^-$); ΔJ=1, D γ to (11/2$^-$). $T_{1/2}$: from DSAM in (^{23}Na,α2pγ).
2892 *10*	1/2$^+$		H	J$^{\pi}$: L(^{3}He,d)=0.
2920.91[a] *15*	(15/2$^-$)	>1.4 ps	BCD	J$^{\pi}$: ΔJ=2, (E2) γ to (11/2$^-$); band assignment.

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Adopted Levels, Gammas (continued)

^{71}As Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[#]	XREF	Comments
				$T_{1/2}$: DSAM in (^{23}Na,α2pγ).
2947 *5*			F H	E(level): weighted average of 2947 *5* from (p,γ) and 2961 *10* from (^{3}He,d).
2989.2 *3*		0.428 ns *35*	E	$T_{1/2}$: from RDM in (α,2nγ),(^{12}C,pnγ).
3119 *10*			H	
3172.64 *9*	(3/2$^-$,5/2$^-$,7/2$^-$)		A	J^π: log *ft*=5.1 from (5/2$^-$).
3237.3 *3*	(17/2$^+$)		D	J^π: ΔJ=(2), (Q) γ to (13/2$^+$).
3260 *10*			H	
3262.6[d] *3*	(15/2$^-$)	0.51 ps *+26−14*	BC	J^π: ΔJ=1, (M1) γ to (13/2$^-$). $T_{1/2}$: from DSAM in (^{23}Na,α2pγ).
3290.41[b] *15*	(17/2$^-$)	1.29 ps *23*	BCD	Q_t=2.10 *+22−16* from (^{19}F,α2pγ). J^π: ΔJ=2, E2 γ to (13/2$^-$); ΔJ=1 γ to (15/2$^-$). $T_{1/2}$: from DSAM in (α,2nγ),(^{12}C,pnγ). Other: >1.4 ps from DSAM in (^{23}Na,α2pγ).
3303 *10*	3/2$^+$,5/2$^+$		H	J^π: L(^{3}He,d)=2.
3394 *10*			H	
3506 *10*	3/2$^+$,5/2$^+$		H	J^π: L(^{3}He,d)=2.
3601.8 *3*	(17/2$^+$)		D	J^π: ΔJ=1, D+Q γ to (15/2$^+$).
3626 *10*	5/2$^-$,7/2$^-$		H	J^π: L(^{3}He,d)=3.
3738.4[e] *3*	(17/2$^-$)	0.28 ps *13*	BC	J^π: ΔJ=2, E2 γ to (13/2$^-$); ΔJ=1, (M1) γ to (15/2$^-$). $T_{1/2}$: from DSAM in (^{23}Na,α2pγ).
3789.0[@] *3*	21/2$^+$	0.29 ps *+11−8*	B DE	J^π: ΔJ=2, E2 γ to 17/2$^+$; band assignment. $T_{1/2}$: from DSAM in (^{23}Na,α2pγ). Others: 0.29 ps *13* from DSAM in (^{19}F,α2pγ); ≤0.7 ps from DSAM in (α,2nγ).
3845.3[c] *3*	(15/2$^-$)		B	J^π: ΔJ=1 γ to 17/2$^-$; ΔJ=(0) γ to (15/2$^-$).
3855 *10*			H	
3916.87[a] *18*	(19/2$^-$)	0.8 ps *+13−4*	BCD	J^π: ΔJ=2, E2 γ to (15/2$^-$); band assignment. $T_{1/2}$: from DSAM in (^{23}Na,α2pγ).
3925 *10*	1/2$^+$		H	J^π: L(^{3}He,d)=0.
4070.3? *11*			E	Additional information 3.
4188.3? *11*		4.2 ps *+35−14*	E	Additional information 4. $T_{1/2}$: from RDM in (α,2nγ).
4232.6[d] *4*	(19/2$^-$)	0.53 ps *20*	BC	Q_t=2.08 *+36−23*. J^π: ΔJ=2, E2 γ to (15/2$^-$); band assignment. $T_{1/2}$: from DSAM in (^{23}Na,α2pγ).
4233.84[b] *24*	(21/2$^-$)	0.53 ps *+16−12*	BCD	J^π: ΔJ=2, E2 γ to (17/2$^-$); band assignment. $T_{1/2}$: weighted average of 0.46 ps *+22−12* from (^{23}Na,α2pγ) and 0.59 ps *16* from (^{19}F,α2pγ).
4372.1[&] *3*	(21/2$^-$)		BCD	J^π: ΔJ=1, D γ to (19/2$^-$); band assignment.
4417.2 *3*	(19/2$^-$)		D	J^π: ΔJ=1, D γ to (17/2$^+$); negative parity assumed by 1994Zi01 in (^{19}F,α2pγ), based on likely (E1) for pure dipole transition.
4463.3 *3*	(19/2$^-$)		D	J^π: ΔJ=1, D γ to (17/2$^+$); negative parity assumed by 1994Zi01 in (^{19}F,α2pγ) in level-scheme Fig. 5 of 1994Zi01, based on likely (E1) for pure dipole transitions. Note that positive parity in Table I of 1994Zi01 seems a misprint.
4570.7 *3*	(21/2$^-$)		B	J^π: ΔJ=1 γ to 19/2$^-$.
4763.8 *3*	(21/2$^-$)		D	J^π: ΔJ=1, (M1+E2) γ to (19/2$^-$); γ to 21/2$^+$. Negative parity assumed in 1994Zi01.
4774.3[e] *4*	(21/2$^-$)	<0.58 ps	BC	J^π: ΔJ=1, D γ to (19/2$^-$); band assignment. $T_{1/2}$: effective half-life from DSAM in (^{23}Na,α2pγ).

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Adopted Levels, Gammas (continued)

^{71}As Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[#]	XREF	Comments
4926.7[c] *4*	(19/2⁻)		B	Jπ: γs to (21/2⁻) and (15/2⁻); band assignment.
5021.8[@] *5*	25/2⁺	0.215 ps *+28−21*	B D	Jπ: ΔJ=2, E2 γ to 21/2⁺; band assignment. $T_{1/2}$: from DSAM in (^{23}Na,α2pγ). Other: 0.21 ps *7* from (^{19}F,α2pγ). Q_t=1.74 *+39−23*.
5073.6[a] *3*	(23/2⁻)	<1.04 ps	BCD	XREF: D(?). Jπ: γ to (19/2⁻); band assignment. $T_{1/2}$: effective half-life from DSAM in (^{23}Na,α2pγ).
5358.6[d] *5*	(23/2⁻)	<0.37 ps	BC	Jπ: γs to (19/2⁻) and (21/2⁻); band assignment. $T_{1/2}$: effective half-life from DSAM in (^{23}Na,α2pγ).
5371.0[b] *6*	(25/2⁻)	0.22 ps *6*	BCD	Jπ: ΔJ=2, E2 γ to (21/2⁻); band assignment. $T_{1/2}$: weighted average of 0.21 ps *6* from (^{23}Na,α2pγ) and 0.23 ps *8* from (^{19}F,α2pγ). Q_t=2.10 *+34−23* from (^{23}Na,α2pγ).
5582.5[&] *4*	(25/2⁻)		B	Jπ: γs to (21/2⁻) and (23/2⁻); band assignment.
5822.9 *4*	(23/2⁻)	>1.4 ps	D	Jπ: ΔJ=1 γ to (21/2⁻); (23/2⁻) proposed in (^{19}F,α2pγ). $T_{1/2}$: from DSAM in (α,2nγ),(^{12}C,pnγ).
5906.3? *5*			D	
5982 *5*			F	
6015 *5*			F	
6150 *5*			F	
6173.9[c] *12*	(23/2⁻)		B	Jπ: γ to (19/2⁻); band assignment.
6270 *5*			F	
6360.2[@] *7*	(29/2⁺)	0.083 ps *28*	B D	Jπ: γ to 25/2⁺; band assignment. $T_{1/2}$: from DSAM in (^{23}Na,α2pγ).
6393 *5*			F	
6479 *5*			F	
6506 *5*			F	
6546 *5*			F	
6587 *5*			F	
6606 *5*			F	
6621.0 *15*			F	
6669 *5*			F	
6672.4[b] *6*	(29/2⁻)	0.21 ps *6*	BCD	Q_t>1.93. Jπ: ΔJ=2, E2 γ to (25/2⁻); band assignment. $T_{1/2}$: from DSAM in (^{23}Na,α2pγ). Other: <0.13 ps from DSAM in (α,2nγ),(^{12}C,pnγ).
6762 *5*			F	
6780.3[&] *6*	(29/2⁻)		B	Jπ: ΔJ=(2) γ to (25/2⁻); band assignment.
6824 *5*			F	
6867 *5*			F	
6889 *5*			F	
6922 *5*			F	
6984 *5*			F	
7000 *5*			F	
7018.2 *15*			F	
7046 *5*			F	
7807.6[@] *12*	(33/2⁺)	<0.23 ps	B	Jπ: γ to (29/2⁺); band assignment. $T_{1/2}$: effective half-life from DSAM in (^{23}Na,α2pγ).
7829.0[&] *10*			B	
8114.4[b] *7*	(33/2⁻)	<0.22 ps	BC	Jπ: ΔJ=2, E2 γ to (29/2⁻); band assignment. $T_{1/2}$: effective half-life from DSAM in (^{23}Na,α2pγ).

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Adopted Levels, Gammas (continued)

^{71}As Levels (continued)

E(level)[†]	J^{π}	$T_{1/2}$[#]	XREF	Comments
8199 *11*	1/2$^-$,3/2$^-$	8 keV	G	J^{π}: L(p,p)=1.
8381 *11*	1/2$^+$	7 keV	G	J^{π}: L(p,p)=0.
8493 *11*	1/2,3/2$^-$		G	J^{π}: L(p,p)=0,1.
8693 *11*	1/2$^+$	35 keV	G	E(level): IAR of 1349 level in ^{71}Ge. J^{π}: L(p,p)=0.
8912 *11*	1/2$^+$	17 keV	G	J^{π}: L(p,p)=0.
8928			G	
9049 *11*	1/2$^+$	12 keV	G	J^{π}: L(p,p)=0.
9066			G	
9160 *11*	1/2$^+$	12 keV	G	J^{π}: L(p,p)=0.
9352	1/2$^+$		G	J^{π}: L(p,p)=0.
9524 *11*	3/2$^-$[‡]	18 keV	G	
9559 *11*	1/2$^+$[‡]	17 keV	G	
9593 *11*	5/2$^+$[‡]	25 keV	G	
9601 *11*	1/2$^+$[‡]	63 keV	G	E(level): IAR of 2226 level in ^{71}Ge.
9617 *11*	1/2$^+$[‡]	28 keV	G	
9684.4[b] *8*	(37/2$^-$)		BC	J^{π}: γ to (33/2$^-$); band assignment.
9686 *11*	5/2$^+$[‡]	21 keV	G	E(level): IAR of 2278 level in ^{71}Ge.
9766	3/2$^+$,5/2$^+$		G	J^{π}: L(p,p)=2.
9909	1/2$^+$		G	J^{π}: L(p,p)=0.
10062	3/2$^+$,5/2$^+$		G	J^{π}: L(p,p)=2.
10485	1/2$^+$		G	J^{π}: L(p,p)=0.
10594	1/2$^+$		G	J^{π}: L(p,p)=0.
10761	3/2$^+$,5/2$^+$		G	J^{π}: L(p,p)=2.
10929	3/2$^+$,5/2$^+$		G	J^{π}: L(p,p)=2.
11037	1/2$^+$		G	J^{π}: L(p,p)=0.
11126	1/2$^+$		G	J^{π}: L(p,p)=0.
11816	1/2$^+$		G	J^{π}: L(p,p)=0.

[†] From a least-squares fit to Eγ data for levels connected with γ transition and from transfers reactions or (p,p) for others, unless otherwise noted.
[‡] From p$\gamma(\theta)$ and analyzing powers in (p,p),(p,p′γ).
[#] Widths for level above 8114 are (p,p),(p,p′γ).
[@] Band(A): Band based on 9/2$^+$.
[&] Band(B): Band based on (21/2$^-$).
[a] Band(C): Band based on (7/2$^-$),α=−1/2.
[b] Band(c): Band based on (5/2$^-$),α=+1/2.
[c] Band(D): Band based on (15/2$^-$).
[d] Band(E): Band based on 7/2$^-$,α=−1/2. Signature partner bands probably built on $\pi f_{7/2}$, which is based on π5/2[303] Nilsson state.
[e] Band(e): Band based on 9/2$^-$,α=+1/2. Signature partner bands probably built on $\pi f_{7/2}$, which is based on π5/2[303] Nilsson state.

Adopted Levels, Gammas (continued)

$\gamma(^{71}As)$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	α[b]	Comments
143.52	(1/2)$^-$	143.4 *2*	100	0.0	5/2$^-$	E2[a]		0.2050 *31*	B(E2)(W.u.)=7.5 +*16*−*11* α(K)=0.1797 *27*; α(L)=0.02178 *33*; α(M)=0.00330 *5* α(N)=0.0002312 *35* E_γ: from (p,2nγ). Others: 143.2 *3* from ^{71}Se ε decay and 145 *2* from (p,γ).
147.44	(3/2)$^-$	147.53 *10*	100	0.0	5/2$^-$	M1[a]		0.0317 *4*	B(M1)(W.u.)=0.0078 +*34*−*18* α(K)=0.0282 *4*; α(L)=0.00302 *4*; α(M)=0.000462 *7* α(N)=3.49×10^{-5} *5* E_γ: weighted average of 147.50 *22* from ^{71}Se ε decay, 147.7 *4* from (^{16}O,3pγ), 147.5 *1* from (^{19}F,α2pγ), 147.9 *2* from (α,2nγ), 145 *2* from (p,γ), and 147.3 *2* from (p,2nγ).
506.18	(3/2)$^-$	358.8 *3*	100 *6*	147.44	(3/2)$^-$				
		362.2 *4*	27 *14*	143.52	(1/2)$^-$				
828.63	(3/2)$^-$	319[&c] *3*		506.18	(3/2)$^-$				
		681.26 *16*	100 *14*	147.44	(3/2)$^-$				E_γ: weighted average of 681.29 *16* from ^{71}Se ε decay and 681.2 *2* from (p,2nγ). Other: 684 *3* from (p,γ), probably for 681.26 + 685.00.
		685.00 *20*	9.3 *7*	143.52	(1/2)$^-$				E_γ: other: 684 *3* from (p,γ), probably for 681.26 + 685.00.
		829[&c] *2*		0.0	5/2$^-$				
870.32	(5/2)$^-$	722.81 *13*	40.0 *19*	147.44	(3/2)$^-$				E_γ: weighted average of 722.90 *13* from ^{71}Se ε decay, 722.5 *2* from (α,2nγ), and 722.9 *2* from (p,2nγ). Other: 725 *3* from (p,γ), probably for 722.81 + 726.70. I_γ: weighted average of 39.6 *14* from ^{71}Se ε decay and 48 *6* from (α,2nγ). Other: 21 *7* in (p,2nγ) is too low by a factor of ≈2; not considered in averaging.
		726.70 *20*	1.8 *7*	143.52	(1/2)$^-$				E_γ: other: 725 *3* from (p,γ), probably for 722.81 + 726.70.
		870.31 *8*	100.0 *7*	0.0	5/2$^-$				E_γ: weighted average of 870.30 *8* from ^{71}Se ε decay, 870.4 *2* from (α,2nγ), and 870.3 *2* from (p,2nγ). Other: 870 *2* from (p,γ). I_γ: others: 100 *11* from (α,2nγ), and 100 *7* from (p,2nγ).
924.58	(7/2$^-$)	414[&c] *3*		506.18	(3/2)$^-$				
		777.3 *3*	7.2 *21*	147.44	(3/2)$^-$				E_γ: weighted average of 777.3 *4* from ^{71}Se ε decay, 777.0 *4* from (^{16}O,3pγ), and 777.4 *3* from (^{19}F,α2pγ). Other: 779 *3* from (p,γ). I_γ: weighted average of 5.8 *16* from ^{71}Se ε decay, 12.2 *33* from (^{16}O,3pγ), and 27 *18* from (^{19}F,α2pγ).
		924.58 *8*	100.0 *26*	0.0	5/2$^-$	D(+Q)	+0.1 *3*		If M1, B(M1)(W.u.)=0.012 *10*. E_γ: weighted average of 924.54 *8* from ^{71}Se ε decay, 924.6 *2* from (^{16}O,3pγ), 924.6 *2* from (^{19}F,α2pγ), 925.0 *2* from (α,2nγ), and 924.4 *2* from (p,2nγ). Other: 924 *2* from (p,γ). I_γ: others: 100 *19* from (^{16}O,3pγ) and 100 *27* from (^{19}F,α2pγ). Mult.,δ: from $\gamma(\theta)$, $\gamma\gamma(\theta)$ and γ(DCO) in in-beam γ-ray studies. δ from $\gamma(\theta)$ in (^{12}C,pnγ) (1980Gu05); ΔJ=1 from γ(DCO).

Adopted Levels, Gammas (continued)

$\gamma(^{71}As)$ (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [†]	E_f	J^π_f	Mult.	Comments
978.06	(3/2⁻,5/2⁻)	830.48 *22*	100.0 *15*	147.44	(3/2)⁻		E_γ: unweighted average of 830.33 *9* from ^{71}Se ε decay, 830.9 *2* from (α,2nγ), and 830.2 *2* from (p,2nγ).
		834.30 *20*	3.9 *10*	143.52	(1/2)⁻		
		978.3 *5*	12.5 *2*	0.0	5/2⁻		E_γ,I_γ: other: 978.8 *2* with Iγ=154 *20* is in severe disagreement with that in ^{71}Se ε decay.
990.57	(3/2,5/2⁻)	484.2 *3*	50 *8*	506.18	(3/2)⁻		E_γ: other: 481 *3* from (p,γ).
		842.99 *9*	100 *4*	147.44	(3/2)⁻		E_γ: other: 846 *3* from (p,γ), probably represents 842.99+847.14.
		847.14 *10*	54 *4*	143.52	(1/2)⁻		E_γ: other: 846 *3* from (p,γ), probably represents 842.99+847.14.
		990.67 *11*	18.3 *17*	0.0	5/2⁻		E_γ: other: 991 *2* from (p,γ).
1000.21	9/2⁺	1000.26 *14*	100	0.0	5/2⁻	(M2)	B(M2)(W.u.)=0.0912 *14* E_γ: weighted average of 1000.20 *20* from ^{71}Se ε decay, 1000.2 *1* from (^{19}F,α2pγ), 1000.8 *2* from (α,2nγ), and 1000.0 *2* from (p,2nγ). Mult.: ΔJ=2, quadrupole from $\gamma(\theta)$ and $\gamma\gamma(\theta)$ in in-beam γ-ray studies; M2 from level scheme.
1129.36	3/2⁺,5/2⁺	981.78 *20*	100 *21*	147.44	(3/2)⁻	[E1]	B(E1)(W.u.)≥1.7×10⁻⁴ E_γ: weighted average of 981.60 *20* from ^{71}Se ε decay, 981.8 *2* from (^{19}F,α2pγ), 982.1 *2* from (α,2nγ), and 981.6 *2* from (p,2nγ).
		1130.0 [c]	<14.7	0.0	5/2⁻		E_γ: from ^{69}Ga(α,2nγ),^{61}Ni(^{12}C,pnγ) only.
1242.64	(3/2⁻,5/2⁻)	373 [&c] *4*		870.32	(5/2)⁻		
		1095.26 *5*	100.0 *15*	147.44	(3/2)⁻		E_γ: others: 1095.5 *2* from (α,2nγ), 1098 *4* from (p,γ), and 1095.0 *2* from (p,2nγ). I_γ: others: 100 *18* from (α,2nγ) and 100 *14* from (p,2nγ). Mult.: (Q), ΔJ=(2) from $\gamma(\theta)$ in (α,2nγ) is inconsistent with adopted ΔJ^π. $\gamma(\theta)$ data in (α,2nγ) could be also consistent with ΔJ=0, which would give J(1243)=(3/2), consistent with adopted (3/2,5/2)⁻.
		1098.82 *12*	14.0 *15*	143.52	(1/2)⁻		E_γ: other: 1098 *4* from (p,γ).
		1242.59 *5*	73.2 *8*	0.0	5/2⁻		E_γ: others: 1243 *4* from (p,γ) and 1242.5 *2* from (p,2nγ). I_γ: other: 100 *14* from (p,2nγ).
1245.31	(5/2⁻)	1097.8 [#] *3*	100	147.44	(3/2)⁻	(D)	E_γ: this γ ray is believed to be different from 1098.82γ from 1242.6 level. Mult.: from $\gamma\gamma$(DCO) in (^{16}O,3pγ) with ΔJ=(1).
1284.79		1137.34 *15*	100	147.44	(3/2)⁻		
1339.54?	(9/2⁻)	213 [c]		1129.36	3/2⁺,5/2⁺		E_γ: from (α,2nγ). Placement from (9/2⁻) to a 1129, 3/2⁺,5/2⁺ level is highly unlikely, as it requires high multipolarity of E3 or M2, inconsistent with the half-life of 0.55 ns for the 1339.5 level.
		418 [c]		924.58	(7/2⁻)		E_γ: from (α,2nγ).
		1339.3 [c] *2*	100	0.0	5/2⁻	[E2]	B(E2)(W.u.)=0.014 *+6−3* E_γ: from (α,2nγ).
1394.69	(9/2)⁻	470.1 [‡] *3*	9.4 *16*	924.58	(7/2⁻)		B(M1)(W.u.)<0.017; B(E2)(W.u.)<114 B(M1)(W.u.) for pure M1, and B(E2)(W.u.) for pure E2. E_γ: other: 470.2 *4* from (^{16}O,3pγ). I_γ: from (^{16}O,3pγ). other: ≈4.6 from (^{19}F,α2pγ).

Adopted Levels, Gammas (continued)

γ(^{71}As) (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[†]	E_f	J^{π}_f	Mult.	Comments
1394.69	(9/2)$^-$	1394.7 *2*	100 *13*	0.0	5/2$^-$	E2	B(E2)(W.u.)<4.1 E_γ: weighted average of 1394.9 *2* from (^{16}O,3pγ), 1394.4 *2* from (^{19}F,α2pγ), and 1394.7 *2* from (p,2nγ). I_γ: from (^{16}O,3pγ). Other: 100 *14* from (^{19}F,α2pγ). Mult.: ΔJ=2, Q from DCO ratios; E2 from RUL.
1412.71	1/2$^-$,3/2$^-$	1265.26 *6*	100 *13*	147.44	(3/2)$^-$		E_γ: other: 1265 *4* from (p,γ).
		1269.39 *22*	24.5 *31*	143.52	(1/2)$^-$		E_γ: weighted average of 1269.40 *20* from ^{71}Se ε decay and 1265 *4* from (p,γ).
1443.12	(3/2,5/2$^-$)	936.91 *7*	100.0 *16*	506.18	(3/2)$^-$		
		1295.68 *7*	53.2 *11*	147.44	(3/2)$^-$		
		1300.3 *4*	8.0 *16*	143.52	(1/2)$^-$		
		1443.27 *14*	23.4 *11*	0.0	5/2$^-$		
1463.08	(3/2,5/2$^-$)	957.00 *18*	77 *5*	506.18	(3/2)$^-$		
		1315.92 *10*	100 *5*	147.44	(3/2)$^-$		
		1319.70 *20*	49 *5*	143.52	(1/2)$^-$		
		1462.54 *12*	70 *9*	0.0	5/2$^-$		
1468.26	(7/2$^-$)	1467.8 *4*		0.0	5/2$^-$	D+Q	E_γ,Mult.: from (^{23}Na,α2pγ); ΔJ=1 from γγ(DCO).
1471.22		1323.77 *11*	100	147.44	(3/2)$^-$		
1488		980 *5*		506.18	(3/2)$^-$		E_γ: from (p,γ) only.
1534	1/2$^+$	1388 *5*		147.44	(3/2)$^-$		E_γ: from (p,γ) only; the 1388γ feeds either 143.49 or 147.41 keV levels.
1615.67	(3/2,5/2,7/2$^-$)	1468.22 *8*	100	147.44	(3/2)$^-$		E_γ: weighted average of 1468.24 *8* from ^{71}Se ε decay and 1468.0 *3* from (p,2nγ).
1714.19	13/2$^+$	714.0[‡] *1*	100	1000.21	9/2$^+$	E2	B(E2)(W.u.)=43.6 *+49−41* E_γ: others: 714.3 *2* from (α,2nγ) and 713.7 *2* from (p,2nγ). Mult.: ΔJ=2 from γγ(DCO) in (^{19}F,α2pγ).
1728.81	(7/2$^-$)	483.6[#] *10*	35[#] *7*	1245.31	(5/2$^-$)	D	Mult.: ΔJ=1 from γγ(DCO) in (^{16}O,3pγ).
		599.3[‡] *2*	100	1129.36	3/2$^+$,5/2$^+$		
		858.8 *6*		870.32	(5/2)$^-$		E_γ: γ from (^{23}Na,α2pγ) only.
		1581.5[#] *10*	33[#] *9*	147.44	(3/2)$^-$		
		1729.0[#] *4*	100[#] *35*	0.0	5/2$^-$	D+Q	Mult.: from γγ(DCO) in (^{16}O,3pγ).
1751.72	(3/2,5/2$^-$)	773.76[c] *18*	22.5 *31*	978.06	(3/2$^-$,5/2$^-$)		
		1604.19 *7*	100 *5*	147.44	(3/2)$^-$		
		1608.7 *5*	20 *5*	143.52	(1/2)$^-$		
		1752.05 *17*	17.4 *21*	0.0	5/2$^-$		
1759.2	(7/2$^-$)	514.0[#] *4*	100[#] *27*	1245.31	(5/2$^-$)		
		1759.0[#] *10*	<65[#]	0.0	5/2$^-$		
1798.14	(9/2$^-$)	329.9 *3*		1468.26	(7/2$^-$)	D+Q	E_γ: from (^{23}Na,α2pγ) only.
		552.6[#] *4*	47[#] *11*	1245.31	(5/2$^-$)	(Q)	Mult.: ΔJ=(2) from γγ(DCO) in (^{16}O,3pγ).
		873.7[‡] *2*	100 *13*	924.58	(7/2$^-$)	D+Q	E_γ: other: 873.8 *3* from (^{16}O,3pγ).

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γ(^{71}As) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	Comments
								I_γ: from (^{16}O,3pγ). Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{19}F,α2pγ).
1798.14	(9/2$^-$)	927.6 *2*		870.32	(5/2)$^-$	Q		E_γ: γ from (^{23}Na,α2pγ) only. Mult.: ΔJ=2 from $\gamma\gamma$(DCO) in (^{23}Na,α2pγ).
1816.8		687.4[‡] *2*	100	1129.36	3/2$^+$,5/2$^+$			
1904.37	(11/2)$^+$	904.3 *2*	100	1000.21	9/2$^+$	M1+E2	−1.0 *5*	B(M1)(W.u.)=0.007 +*10*−*4*; B(E2)(W.u.)=13 +*14*−*9* E_γ: weighted average of 904.1 *2* from (^{19}F,α2pγ) and 904.5 *2* from (α,2nγ). Mult.,δ: from $\gamma(\theta)$ in (α,2nγ),(^{12}C,pnγ) and RUL; ΔJ=1 from $\gamma\gamma$(DCO) in (^{19}F,α2pγ).
1981.59	(3/2$^-$,5/2$^-$,7/2$^-$)	1003.42 *11*	34.8 *13*	978.06	(3/2$^-$,5/2$^-$)			
		1834.09 *6*	100.0 *19*	147.44	(3/2)$^-$			
		1981.67 *8*	32.9 *13*	0.0	5/2$^-$			
2061.89	(9/2$^-$)	302.7[#] *4*	62[#] *13*	1759.2	(7/2$^-$)	D		Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{16}O,3pγ).
		333.2[#] *3*	100[#] *19*	1728.81	(7/2$^-$)	D		Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{16}O,3pγ).
2100.27		1122.2 *2*	100	978.06	(3/2$^-$,5/2$^-$)			E_γ: from (α,2nγ).
2110.79	(11/2$^-$)	312.6[‡] *3*	17 *5*	1798.14	(9/2$^-$)	D		E_γ: other: 312.7 *10* from (^{16}O,3pγ). I_γ: weighted average of 15 *5* from (^{16}O,3pγ) and 29 *14* from (^{19}F,α2pγ). Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{16}O,3pγ) and (^{19}F,α2pγ).
		642.4 *2*		1468.26	(7/2$^-$)	Q		E_γ: γ from (^{23}Na,α2pγ) only. Mult.: ΔJ=2 from $\gamma\gamma$(DCO) in (^{23}Na,α2pγ).
		716.4 *3*	34 *12*	1394.69	(9/2)$^-$			E_γ: weighted average of 716.1 *4* from (^{16}O,3pγ) and 716.6 *3* from (^{19}F,α2pγ). I_γ: weighted average of 37 *12* from (^{16}O,3pγ) and 29 *14* from (^{19}F,α2pγ).
		1110.4[‡] *3*	57[‡] *29*	1000.21	9/2$^+$			
		1186.3 *2*	100 *25*	924.58	(7/2$^-$)	Q		E_γ: weighted average of 1186.4 *3* from (^{16}O,3pγ) and 1186.2 *2* from (^{19}F,α2pγ). I_γ: from (^{16}O,3pγ). Other: 100 *29* from (^{19}F,α2pγ). Mult.: ΔJ=2 from $\gamma\gamma$(DCO) in (^{16}O,3pγ) and (^{19}F,α2pγ).
2369.95	(3/2,5/2,7/2)	1445.5 *3*	100 *12*	924.58	(7/2$^-$)			
		1499.56 *19*	35 *8*	870.32	(5/2)$^-$			
2416.09	(13/2$^+$)	511.9[‡] *5*	100[‡] *42*	1904.37	(11/2)$^+$			
		701.9[‡] *2*	50[‡] *8*	1714.19	13/2$^+$	D+Q		Mult.: ΔJ=0 transition from $\gamma\gamma$(DCO) in (^{19}F,α2pγ).
		1415.7[‡] *4*	25[‡] *8*	1000.21	9/2$^+$	(Q)		
2416.61	(11/2$^-$)	354.8[#] *2*	100	2061.89	(9/2$^-$)	D		Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{16}O,3pγ).

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Adopted Levels, Gammas (continued)

$\gamma(^{71}As)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	α[b]	Comments
2416.61	(11/2⁻)	687.7 *2*		1728.81	(7/2⁻)			E_γ: γ from (^{23}Na,α2pγ) only.
		1492.2 *5*		924.58	(7/2⁻)			E_γ: γ from (^{23}Na,α2pγ) only.
2429.23	(3/2⁻,5/2⁻)	1186.46 *14*	100 *6*	1242.64	(3/2⁻,5/2⁻)			
		1504.58 *11*	69 *6*	924.58	(7/2⁻)			
		1559.3[c] *3*	22 *13*	870.32	(5/2)⁻			
		2282.05 *22*	56 *6*	147.44	(3/2)⁻			
		2286.5 *4*	19 *9*	143.52	(1/2)⁻			
		2429.36[c] *25*	31 *6*	0.0	5/2⁻			
2469.92	(13/2⁻)	671.7 *2*	37 *8*	1798.14	(9/2⁻)	(E2)	1.07×10^{-3} *2*	B(E2)(W.u.)<58 E_γ: weighted average of 671.8 *2* from (^{16}O,3pγ) and 671.5 *3* from (^{19}F,α2pγ). I_γ: weighted average of 39 *8* from (^{16}O,3pγ) and 33 *10* from (^{19}F,α2pγ). Mult.: ΔJ=2 from $\gamma\gamma$(DCO) in (^{16}O,3pγ) and (^{19}F,α2pγ).
		756.1 *2*		1714.19	13/2⁺			E_γ: from (^{23}Na,α2pγ) only, weaker than the 671.7γ.
		1075.2 *1*	100 *13*	1394.69	(9/2)⁻	(E2)		B(E2)(W.u.)<13 E_γ: from (^{19}F,α2pγ). Other: 1075.4 *2* from (^{16}O,3pγ). I_γ: from (^{16}O,3pγ). Other: 100 *14* from (^{19}F,α2pγ). Mult.: ΔJ=2 from $\gamma\gamma$(DCO) in (^{16}O,3pγ) and (^{19}F,α2pγ); E2 from RUL.
2506.91	(3/2,5/2,7/2⁻)	1528.82[c] *22*	46 *15*	978.06	(3/2⁻,5/2⁻)			
		1637.0[c] *4*	15 *4*	870.32	(5/2)⁻			
		2359.30 *14*	100 *8*	147.44	(3/2)⁻			
		2507.22 *23*	54 *8*	0.0	5/2⁻			
2689.12	17/2⁺	974.9[‡] *1*	100	1714.19	13/2⁺	E2		B(E2)(W.u.)=69 *+27−16* E_γ: other: 974.9 *2* from (α,2nγ). Mult.: ΔJ=2 from $\gamma\gamma$(DCO) in (^{19}F,α2pγ); M2 ruled out by RUL.
2748.6	(13/2⁺)	844.2 *2*	100	1904.37	(11/2)⁺	D+Q		E_γ: weighted average of 844.0 *3* from (^{19}F,α2pγ) and 844.3 *2* from (α,2nγ). Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{19}F,α2pγ).
2793.12	(15/2⁺)	889.0[‡] *3*	15[‡] *5*	1904.37	(11/2)⁺	[E2]		B(E2)(W.u.)≥0.23
		1078.9[‡] *1*	100[‡] *10*	1714.19	13/2⁺	(M1+E2)		E_γ: other: 1075.9 *2* in (α,2nγ),(^{12}C,pnγ). Mult.: D+Q, ΔJ=1 from $\gamma\gamma$(DCO) in (^{19}F,α2pγ); M1+E2 from level scheme.
2820.1	(13/2⁻)	403.5[#] *2*	100[#] *17*	2416.61	(11/2⁻)	(M1)	0.00256 *4*	B(M1)(W.u.)<0.2 Mult.: ΔJ=1 from $\gamma\gamma$(DCO) in (^{16}O,3pγ).

$^{71}_{33}As_{38}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{71}As)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	α[b]	Comments
2820.1	(13/2⁻)	758.1[#] *4*	28[#] *6*	2061.89	(9/2⁻)	(E2)		B(E2)(W.u.)<27 Mult.: ΔJ=2 from γγ(DCO) in (^{16}O,3pγ).
2920.91	(15/2⁻)	451.1 *2*	90 *17*	2469.92	(13/2⁻)	(M1)	1.97×10⁻³ *3*	B(M1)(W.u.)<0.064 E_γ: weighted average of 451.0 *2* from (^{16}O,3pγ) and 451.2 *2* from (^{19}F,α2pγ). I_γ: weighted average of 92 *17* from (^{16}O,3pγ) and 84 *34* from (^{19}F,α2pγ). Mult.: ΔJ=1 from γγ(DCO) in (^{16}O,3pγ); M1 from level scheme.
		810.1 *2*	100 *21*	2110.79	(11/2⁻)	(E2)		B(E2)(W.u.)<27 E_γ: weighted average of 810.2 *2* from (^{16}O,3pγ) and 809.9 *2* from (^{19}F,α2pγ). I_γ: from (^{16}O,3pγ). Other: 100 *34* from (^{19}F,α2pγ). Mult.: ΔJ=2 from γγ(DCO) in (^{16}O,3pγ), most likely E2.
		1206.4[‡] *4*	133[‡] *34*	1714.19	13/2⁺	(E1)		B(E1)(W.u.)<8.4×10⁻⁵ Mult.: ΔJ=1 from γγ(DCO) in (^{19}F,α2pγ); E1 from level scheme.
2989.2		300.1 *2*	100	2689.12	17/2⁺			E_γ: from (α,2nγ).
3172.64	(3/2⁻,5/2⁻,7/2⁻)	1701.1[c] *3*	26 *5*	1471.22				
		1729.68 *12*	67 *5*	1443.12	(3/2,5/2⁻)			
		1759.93 *10*	100 *5*	1412.71	1/2⁻,3/2⁻			
		1929.9[c] *3*	31 *5*	1242.64	(3/2⁻,5/2⁻)			
		3023.5[c] *5*	7.7 *26*	147.44	(3/2)⁻			
		3171.82 *22*	25.6 *26*	0.0	5/2⁻			
3237.3	(17/2⁺)	821.2[‡] *3*	100	2416.09	(13/2⁺)	(Q)		Mult.: ΔJ=(2) from γγ(DCO) in (^{19}F,α2pγ).
3262.6	(15/2⁻)	442.6[#] *2*	100[#] *16*	2820.1	(13/2⁻)	(M1)	2.06×10⁻³ *3*	B(M1)(W.u.)=0.36 *+14−12* Mult.: D, ΔJ=1 from γγ(DCO) in (^{16}O,3pγ).
		846.0[#] *3*	38[#] *7*	2416.61	(11/2⁻)	[E2]		B(E2)(W.u.)=40 *+18−14*
3290.41	(17/2⁻)	369.6[#] *4*	6.4[#] *13*	2920.91	(15/2⁻)	(M1)	0.00315 *4*	B(M1)(W.u.)=0.020 *+7−5* Mult.: D, ΔJ=1 from γγ(DCO) in (^{16}O,3pγ); M1 from level scheme.
		820.5[‡] *1*	100 *13*	2469.92	(13/2⁻)	E2		B(E2)(W.u.)=63 *+13−10* E_γ: other: 820.6 *2* from (^{16}O,3pγ). I_γ: from (^{16}O,3pγ). Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.

$\gamma(^{71}As)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[b]	Comments
3601.8	(17/2+)	808.7[‡] *3*	100	2793.12	(15/2+)	D+Q		Mult.: ΔJ=1 from γγ(DCO) in (^{19}F,α2pγ).
3738.4	(17/2−)	475.9[#] *2*	100[#] *15*	3262.6	(15/2−)	(M1)	1.74×10^{-3} *2*	B(M1)(W.u.)=0.52 *+39−17* Mult.: D, ΔJ=1 from γγ(DCO) in (^{16}O,3pγ); M1 from level scheme.
		918.1[#] *4*	41[#] *5*	2820.1	(13/2−)	E2		B(E2)(W.u.)=52 *+41−17* Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.
3789.0	21/2+	1099.8 *4*	100	2689.12	17/2+	E2		B(E2)(W.u.)=69 *+26−19* E_γ: unweighted average of 1100.1 *2* from (^{19}F,α2pγ) and 1099.4 *2* from (α,2nγ).
3845.3	(15/2−)	554.8 *4*		3290.41	(17/2−)	D+Q		Mult.: ΔJ=1 from γγ(DCO) in (^{23}Na,α2pγ).
		924.0 *6*		2920.91	(15/2−)	(D+Q)		Mult.: ΔJ=(0) from γγ(DCO) in (^{23}Na,α2pγ).
3916.87	(19/2−)	626.5[‡] *2*	51 *27*	3290.41	(17/2−)	(M1)		B(M1)(W.u.)=0.028 *+32−18* E_γ: other: 626.4 *3* from (^{16}O,3pγ). I_γ: unweighted average of 24.6 *29* from (^{16}O,3pγ) and 78 *22* from (^{19}F,α2pγ). Mult.: D, ΔJ=1 from γγ(DCO) in (^{16}O,3pγ); M1 from level scheme.
		679.5[‡] *3*	22[‡] *11*	3237.3	(17/2+)	[E1]		B(E1)(W.u.)=0.00017 *+21−11*
		996.0[#] *2*	100[#] *20*	2920.91	(15/2−)	E2		B(E2)(W.u.)=20 *+21−11* E_γ,I_γ: other: 995.9 *3* with Iγ=100 *33* from (^{19}F,α2pγ). Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.
		1227.2[‡] *5*	33[‡] *22*	2689.12	17/2+	[E1]		B(E1)(W.u.)=4×10^{-5} *+6−3*
4070.3?		281[c]		3789.0	21/2+			E_γ: from (α,2nγ) only.
4188.3?		1395[c]		2793.12	(15/2+)			E_γ: from (α,2nγ) only.
4232.6	(19/2−)	494.2[#] *3*	100[#] *12*	3738.4	(17/2−)	(M1)	1.60×10^{-3} *2*	B(M1)(W.u.)=0.17 *+11−5* Mult.: D, ΔJ=1 from γγ(DCO) in (^{16}O,3pγ); M1 from level scheme.
		969.9[#] *3*	99[#] *12*	3262.6	(15/2−)	E2		B(E2)(W.u.)=35 *+21−10* Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.
4233.84	(21/2−)	943.5 *2*	100	3290.41	(17/2−)	E2		B(E2)(W.u.)=82 *+24−19* E_γ: weighted average of 943.4 *2* from (^{16}O,3pγ) and 943.5 *2* from (^{19}F,α2pγ). Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.
4372.1	(21/2−)	455.3 *2*	100	3916.87	(19/2−)	D		E_γ: weighted average of 455.2 *2* from (^{16}O,3pγ) and 455.4 *2* from (^{19}F,α2pγ). Mult.: ΔJ=1 from γγ(DCO) in (^{16}O,3pγ).
4417.2	(19/2−)	1728.2[‡] *5*	100	2689.12	17/2+	D		Mult.: ΔJ=1 from γγ(DCO) in (^{19}F,α2pγ).
4463.3	(19/2−)	861.5[‡] *3*	50[‡] *33*	3601.8	(17/2+)	D		Mult.: ΔJ=1 from γγ(DCO) in (^{16}O,3pγ).
		1773.9[‡] *5*	100[‡] *17*	2689.12	17/2+	D		Mult.: ΔJ=1 from γγ(DCO) in (^{16}O,3pγ).
4570.7	(21/2−)	653.6 *3*		3916.87	(19/2−)	D+Q		Mult.: ΔJ=1 from γγ(DCO) in (^{23}Na,α2pγ).

$^{71}_{33}As_{38}$-13

$\gamma(^{71}As)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	α[b]	Comments
4763.8	(21/2⁻)	300.5[‡] *1*	100[‡] *17*	4463.3	(19/2⁻)	(M1+E2)	≈−0.5		Mult.,δ: ΔJ=1 from γγ(DCO) in (^{19}F,α2pγ).
		346.6[‡] *1*	67[‡] *17*	4417.2	(19/2⁻)	(D+Q)			Mult.: ΔJ=(1) from γγ(DCO) in (^{19}F,α2pγ).
		974.7[‡] *3*	33[‡] *17*	3789.0	21/2⁺				
4774.3	(21/2⁻)	541.6[#] *4*	100[#] *19*	4232.6	(19/2⁻)	(M1)		1.30×10^{-3} *2*	B(M1)(W.u.)>0.11 Mult.: ΔJ=1 from γγ(DCO) in (^{16}O,3pγ); M1 from level scheme.
		1035.9[#] *4*	84[#] *16*	3738.4	(17/2⁻)	[E2]			B(E2)(W.u.)>17
4926.7	(19/2⁻)	693.1 *4*		4233.84	(21/2⁻)				
		1081.1 *4*		3845.3	(15/2⁻)				
5021.8	25/2⁺	1232.8[‡] *4*	100	3789.0	21/2⁺	E2			B(E2)(W.u.)=53 *6* Mult.: Q, ΔJ=2 from γγ(DCO) in (^{19}F,α2pγ); M2 ruled out by RUL.
5073.6	(23/2⁻)	839.8 *7*		4233.84	(21/2⁻)				E_γ: γ from (^{23}Na,α2pγ) only.
		1156.8 *3*	100	3916.87	(19/2⁻)	[E2]			B(E2)(W.u.)>15 E_γ: weighted average of 1156.9 *3* from (^{16}O,3pγ) and 1156.6 *4* from (^{19}F,α2pγ).
5358.6	(23/2⁻)	584.6[#] *10*	21[#] *7*	4774.3	(21/2⁻)	[M1,E2]		0.00134 *25*	
		1126.0[#] *4*	100[#] *22*	4232.6	(19/2⁻)	[E2]			B(E2)(W.u.)>36
5371.0	(25/2⁻)	1137.1 *5*	100	4233.84	(21/2⁻)	E2			B(E2)(W.u.)=78 *+29−17* E_γ: unweighted average of 1137.5 *2* from (^{16}O,3pγ) and 1136.6 *3* from (^{19}F,α2pγ). Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.
5582.5	(25/2⁻)	509.4 *6*		5073.6	(23/2⁻)				
		1011.3 *4*		4570.7	(21/2⁻)				
		1211.0 *6*		4372.1	(21/2⁻)				
5822.9	(23/2⁻)	1059.1[‡] *2*	100	4763.8	(21/2⁻)	(M1+E2)			Mult.: ΔJ=1 from γγ(DCO) in (^{19}F,α2pγ); M1+E2 from level scheme.
5906.3?		1142.5[‡] *4*	100	4763.8	(21/2⁻)				
6173.9	(23/2⁻)	1247.2 *11*		4926.7	(19/2⁻)				
6360.2	(29/2⁺)	1338.4 *4*	100	5021.8	25/2⁺	[E2]			B(E2)(W.u.)=91 *+46−23*
6621.0		3674[@] *7*	18.2[@]	2947					
		3964[@] *7*	19.5[@]	2657	3/2⁺,5/2⁺				
		4133[@] *7*	4.3[@]	2488					
		4261[@] *7*	18.6[@]	2360					
		4647[@] *7*	9.5[@]	1974	7/2⁺,9/2⁺				
		5012[@] *7*	24.7[@]	1609	1/2⁻,3/2⁻				

$^{71}_{33}As_{38}$-14

Adopted Levels, Gammas (continued)

$\gamma(^{71}As)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.	Comments
6621.0		5088@ *7*	10.8@	1534	1/2+		
		5131@ *7*	31@	1488			
		5154@ *6*	4.3@	1468.26	(7/2−)		E_γ: 5154γ feeds either the 1463 or 1471 level. X.
		5211@ *6*	28@	1412.71	1/2−,3/2−		
		5378@ *6*	19.1@	1242.64	(3/2−,5/2−)		
		5614@ *6*	24.2@	1007	1/2−,3/2−		
		5630@ *5*	33@	990.57	(3/2,5/2−)		
		5697@ *5*	15.2@	924.58	(7/2−)		
		5751@ *5*	22.1@	870.32	(5/2)−		
		5792@ *5*	21.7@	828.63	(3/2)−		
		6111@ *5*	24.7@	506.18	(3/2)−		
		6476@ *5*	100@	143.52	(1/2)−		E_γ: 6476γ feeds either the 143 or 147 level.
		6621@ *5*	4.3@	0.0	5/2−		
6672.4	(29/2−)	1301.4 *2*	100	5371.0	(25/2−)	E2	B(E2)(W.u.)=41 *+17−9* E_γ: from (^{16}O,3pγ). Other: 1301.3 *5* from (^{19}F,α2pγ). Mult.: Q, ΔJ=2 from γγ(DCO) in (^{16}O,3pγ); M2 ruled out by RUL.
6780.3	(29/2−)	1197.8 *5*		5582.5	(25/2−)	(Q)	Mult.: ΔJ=(2) from γγ(DCO) in (^{23}Na,α2pγ).
7018.2		4071@ *7*	28@	2947			
		4361@ *7*	23.6@	2657	3/2+,5/2+		
		4530@ *7*	5.8@	2488			
		4658@ *7*	24.1@	2360			
		5044@ *7*	19.5@	1974	7/2+,9/2+		
		5409@ *7*	33@	1609	1/2−,3/2−		
		5485@ *7*	5.8@	1534	1/2+		
		5528@ *7*	29@	1488			
		5551@ *6*	20.1@	1468.26	(7/2−)		E_γ: 5551γ feeds either the 1463 or 1471 level.
		5608@ *6*	31@	1412.71	1/2−,3/2−		
		5775@ *6*	25@	1242.64	(3/2−,5/2−)		
		6011@ *6*	40@	1007	1/2−,3/2−		
		6027@ *5*	51@	990.57	(3/2,5/2−)		
		6094@ *5*	27@	924.58	(7/2−)		
		6148@ *5*	36@	870.32	(5/2)−		
		6189@ *5*	27@	828.63	(3/2)−		

Adopted Levels, Gammas (continued)

$\gamma(^{71}As)$ (continued)

E_i(level)	J^{π}_i	E_γ†	I_γ†	E_f	J^{π}_f	Mult.	Comments
7018.2		6508@ *5*	32@	506.18	$(3/2)^-$		
		6872@ *5*	100@	147.44	$(3/2)^-$		E_γ: 6872γ feeds 143 and/or 147 levels.
		7018@ *5*	19.0@	0.0	$5/2^-$		
7807.6	$(33/2^+)$	1447.4 *10*		6360.2	$(29/2^+)$	[E2]	B(E2)(W.u.)>22
7829.0		1048.7 *7*		6780.3	$(29/2^-)$		
8114.4	$(33/2^-)$	1442.0 *3*	100	6672.4	$(29/2^-)$	E2	B(E2)(W.u.)>24 Mult.: Q, ΔJ=2 from $\gamma\gamma$(DCO) in (^{23}Na,α2pγ); M2 ruled out by RUL.
9684.4	$(37/2^-)$	1570.0# *4*	100	8114.4	$(33/2^-)$		

† From ^{71}Se ε decay up to 3173 level and from (^{23}Na,α2pγ) above that, unless otherwise noted. Weighted averages are taken where values are available from different studies.

‡ From (^{19}F,α2pγ).

From (^{16}O,3pγ).

@ From (p,γ).

& Reported in (p,γ) only, treated as questionable by the evaluators.

[a] α(K)exp(143)/α(K)exp(147)=6 (1980Te01,(p,2nγ)) gives E2 for one transition and M1 for the other; $\gamma\gamma(\theta)$(DCO) in (^{16}O,3pγ) gives ΔJ=1, dipole for 147γ; thus M1 is assigned to 147γ and E2 to 143γ.

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

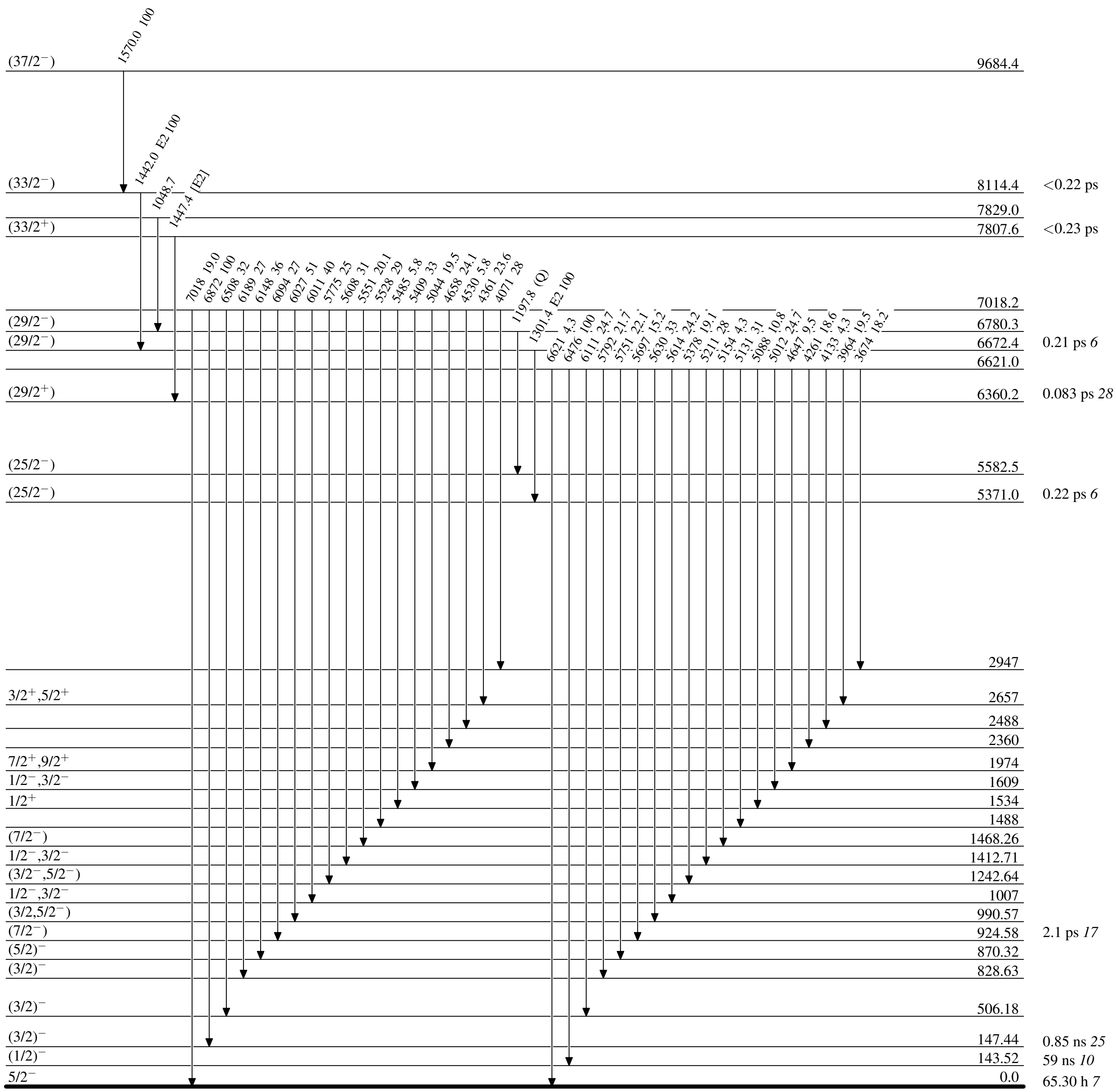
[c] Placement of transition in the level scheme is uncertain.

$^{71}_{33}As_{38}$-16

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



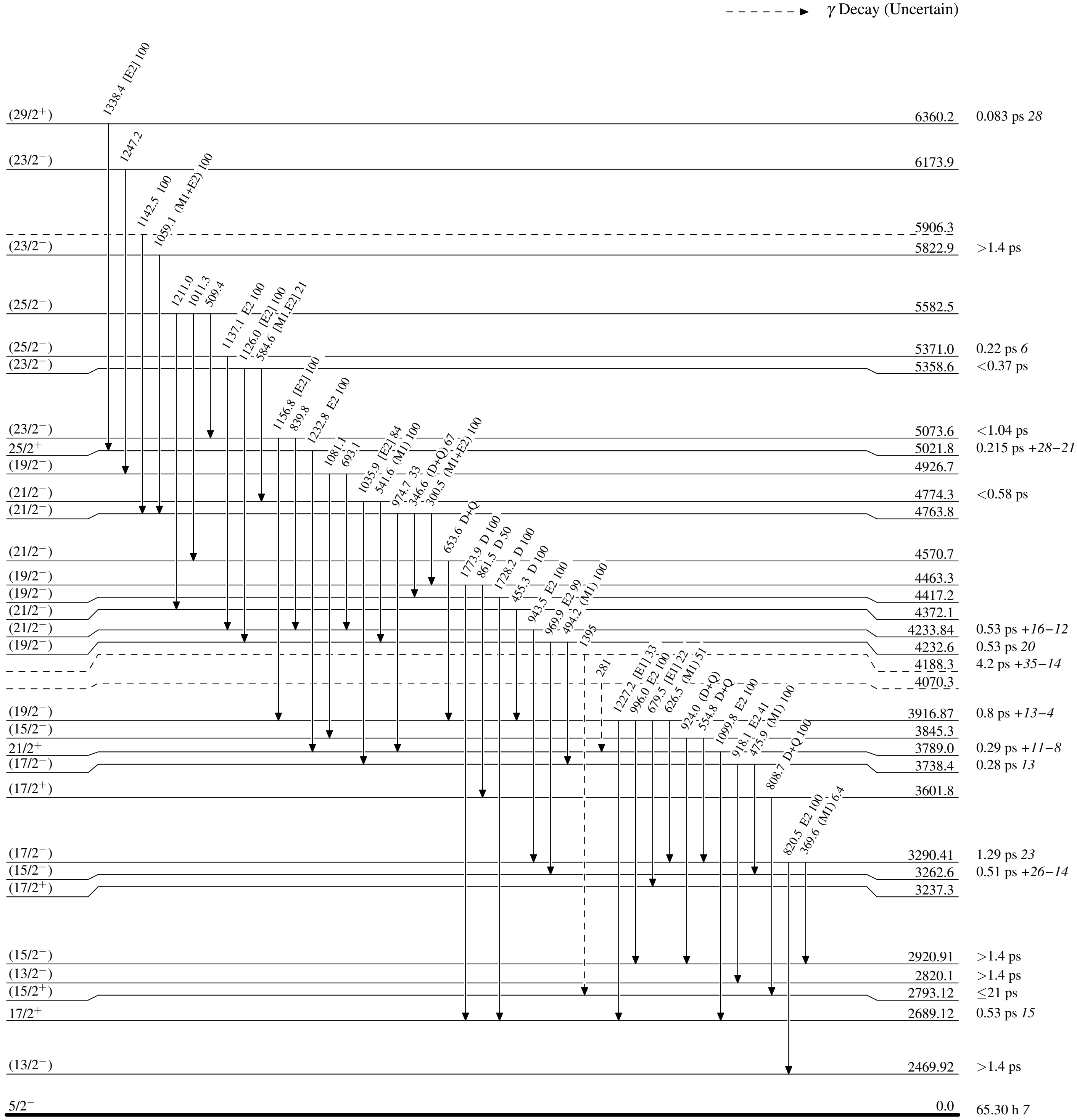
$^{71}_{33}As_{38}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

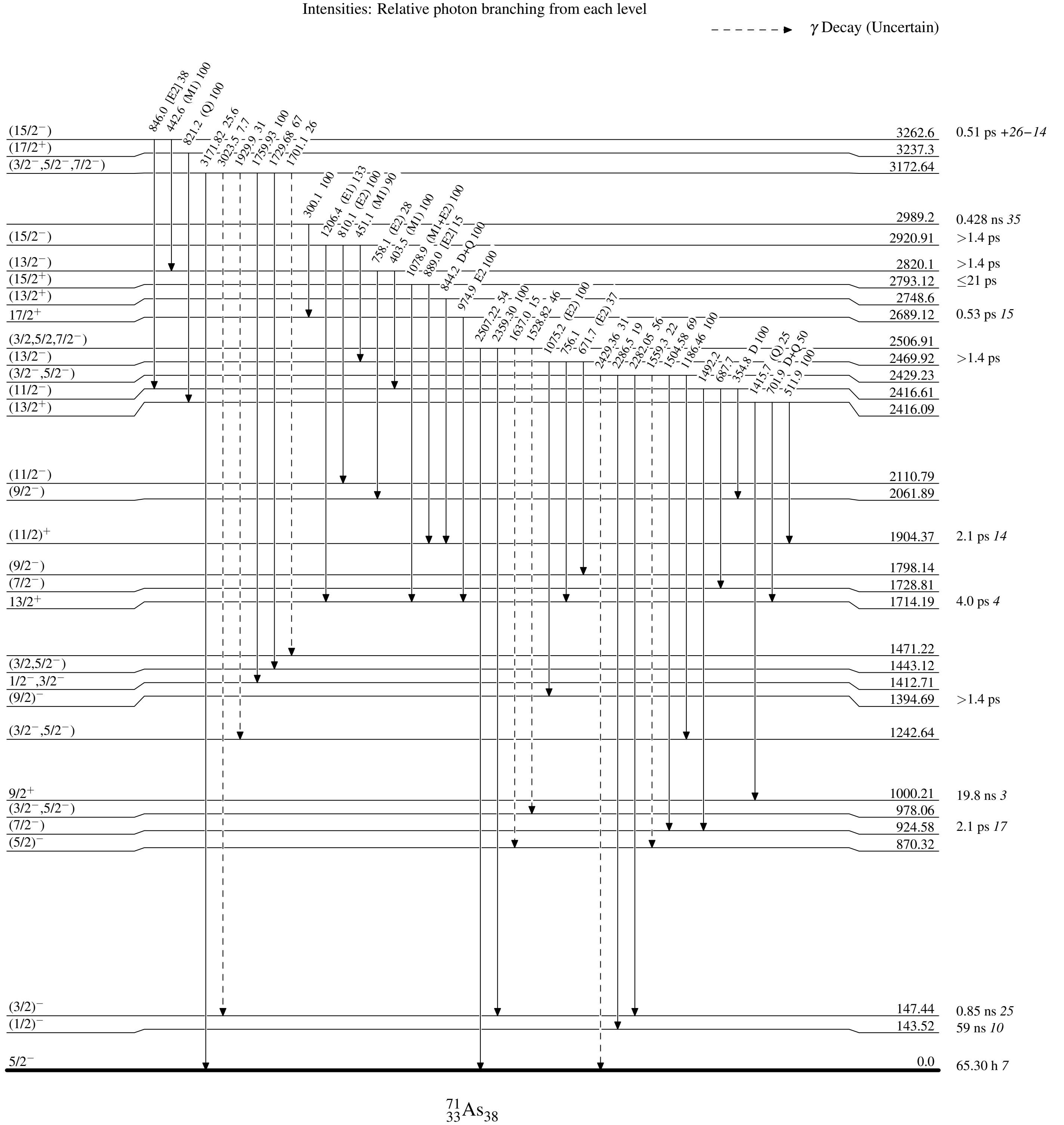


$^{71}_{33}As_{38}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



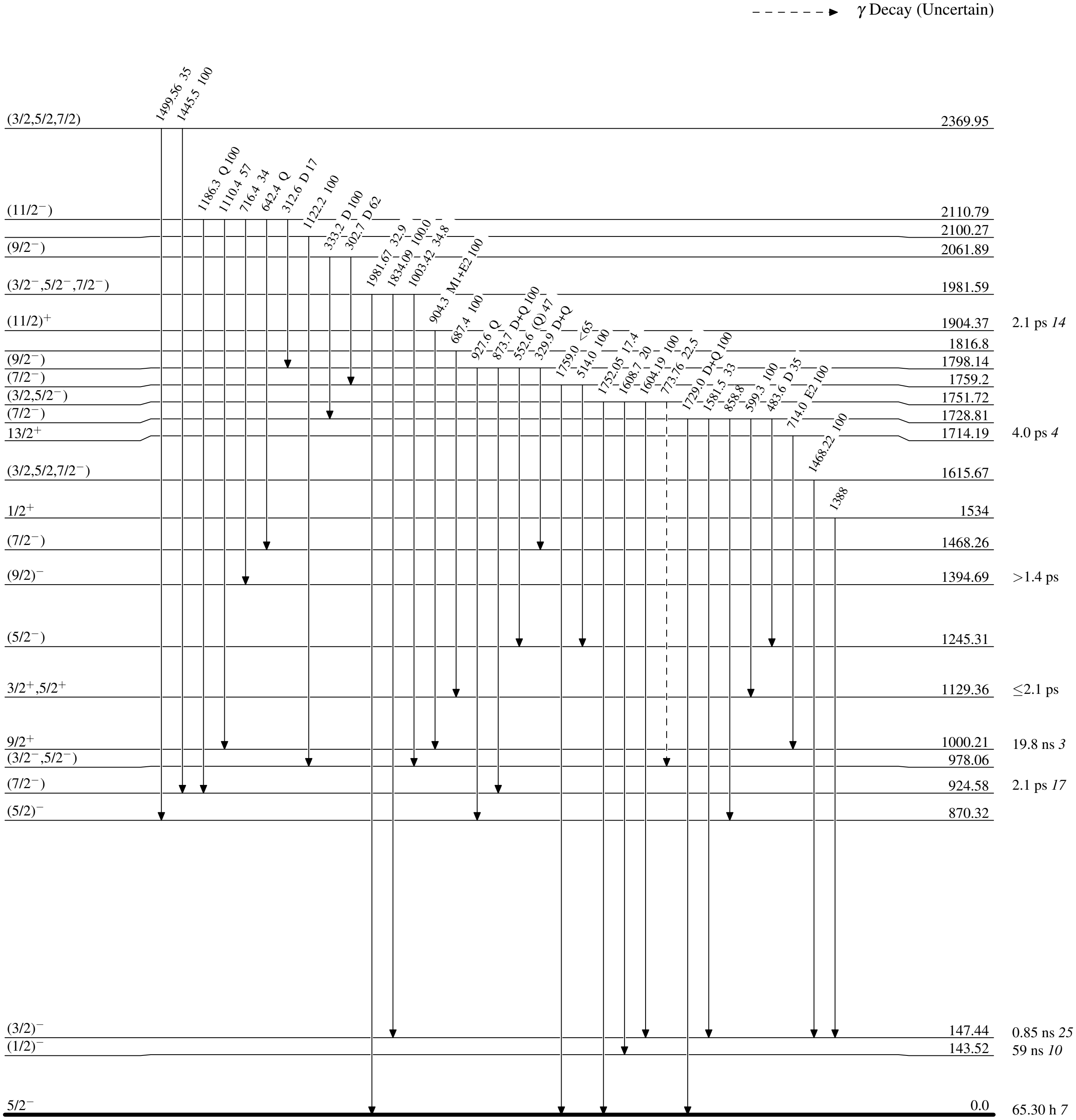
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend

γ Decay (Uncertain)

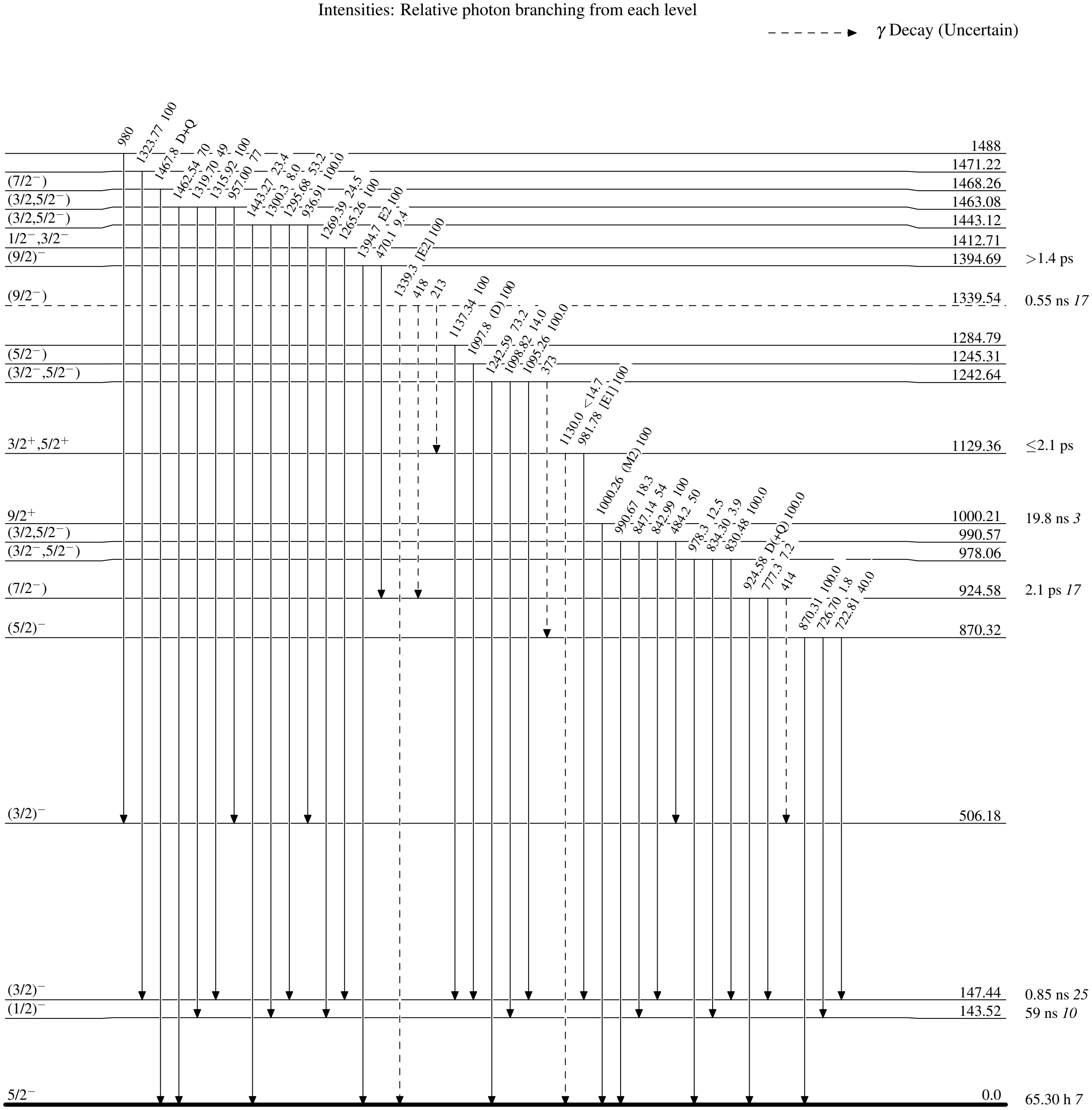


$^{71}_{33}As_{38}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

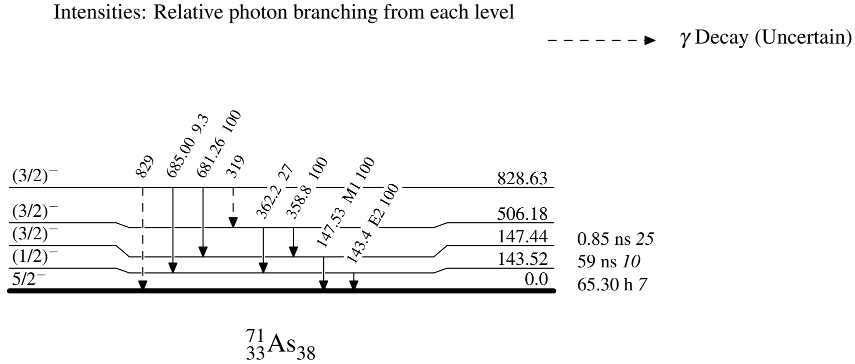


$^{71}_{33}As_{38}$

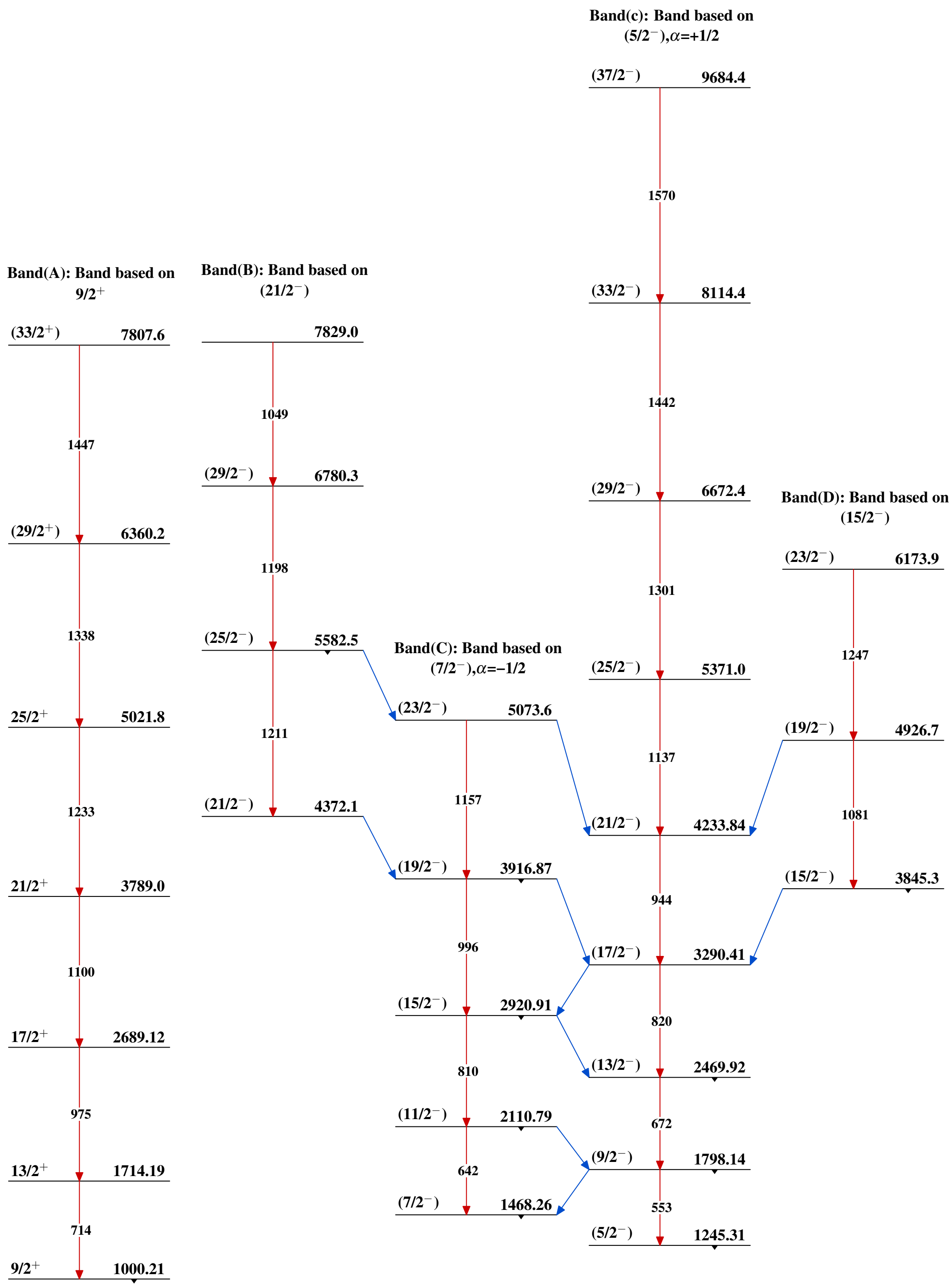
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

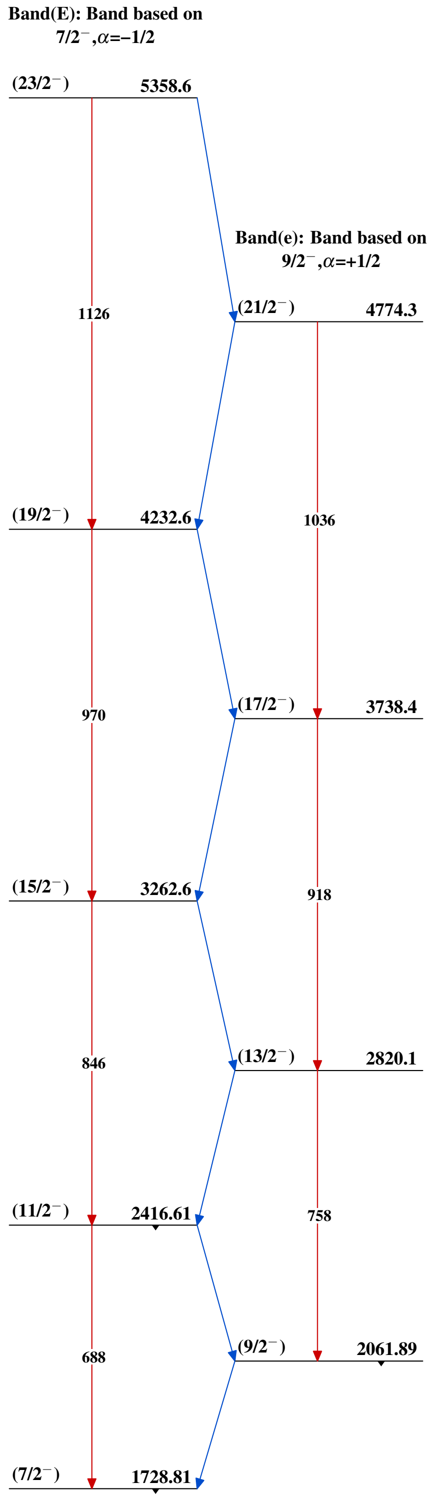


Adopted Levels, Gammas



$^{71}_{33}As_{38}$

Adopted Levels, Gammas (continued)



$^{71}_{33}As_{38}$