Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 199,1 (2025)	30-Sep-2024

Q(β^-)=248.5 *11*; S(n)=10103.8 *11*; S(p)=9548.6 *11*; Q(α)=−10554.5 *11* 2021Wa16
S(2n)=18039.4 *11*, S(2p)=25964.6 *25* (2021Wa16).
^{33}P first identified and produced in ^{34}S(γ,p), ^{35}Cl(γ,2p), and ^{37}Cl(γ,α) at Eγ=48 MeV (1951Sh92).
Mass measurement: 2003Bl17.
Other measurements:
2021Ku15: ^{27}Al(^{6}Li,X),(^{7}Li,X) E=6-13 MeV from the VERA accelerator of the University of Vienna. Measured cross sections.
2007De15,2003Wa23: ^{36}Cl(n,α) at GELINA neutron facility. Measured cross sections.
Structure calculations:
2022St03: calculated B(E2) of $3/2^+$ to $1/2^+$.
2020Ku10: calculated M(>) matrix elements.
2019Lu11: calculated levels, J, π, occupancies, B(M1), B(E2), $T_{1/2}$ using FSU shell-model interaction.
2019Gr08, 2018Lu08, 2016Fu09: calculated levels, J, π using PSDPF shell-model interaction.
2018Hu12: calculated levels, J, π using different chiral shell-model interactions.
Additional information 1.

^{33}P Levels

Cross Reference (XREF) Flags

A	^{33}Si β^- decay (6.11 s)	E	^{30}Si(α,pγ)	I	^{34}S(pol d,^{3}He)
B	^{18}O(^{18}O,p2nγ)	F	^{31}P(t,p)	J	^{208}Pb(^{36}S,Xγ)
C	^{26}Mg(^{13}C,αpnγ)	G	^{31}P(t,pγ)		
D	^{30}Si(α,p)	H	^{34}S(d,^{3}He)		

E(level)†	J$^\pi$	$T_{1/2}$‡	XREF	Comments
0.0	$1/2^+$	25.38 d *6*	ABCDEFGHIJ	%β^-=100 J$^\pi$: L(d,^{3}He)=L(t,p)=0 from 0^+. $T_{1/2}$: weighted average of 25.2 d *5* (1960Fi05), 25.30 d *5* (1968Re04), 25.56 d *7* (1972La14), 24.8 d *5* (1952Je12), 25 d *2* (1952We29), and 25 d *2* (1951Sh92), with a reduced χ^2=2.1. Other: 24.4 d *2* (1954Ni06) is discrepant. Weighted average of all is 25.34 d *10* with a reduced χ^2=5.6; unweighted average of all is 25.04 d *14*.
1431.72 *15*	$3/2^+$	0.43 ps *7*	ABCDEFGHIJ	J$^\pi$: (pol d,^{3}He)=2 and L-1/2 transfer from analyzing power. $T_{1/2}$: weighted average of 0.41 ps *9* from (α,pγ) and 0.44 ps *7* from (t,pγ), both by DSAM. Other: <1.4 ps from RDM in (^{36}S,Xγ).
1847.72 *13*	$5/2^+$	0.78 ps *11*	ABCDEFGHIJ	J$^\pi$: L(pol d,^{3}He)=2 and L+1/2 transfer from analyzing power. $T_{1/2}$: from τ=1.12 ps *15*, 1.20 ps *30* (1973Ca20), 1.36 ps *17* (1969Cu01) and 1.20 ps *20* (1975Ni01) in (α,pγ), 1.40 ps *30* (1973Po03) and 0.80 ps *15* (1973Wa14) in (t,pγ), all by DSAM except RDM in 1975Ni01. Other: <1.4 ps from RDM in (^{36}S,Xγ).
2538.60 *25*	$3/2^+$	35 fs *14*	AB DEFGH	J$^\pi$: spin=3/2 from p$\gamma(\theta)$ in (t,pγ); L(d,^{3}He)=2 from 0^+ and L(t,p)=2 from $1/2^+$. $T_{1/2}$: from DSAM in (t,pγ). Other: <7 fs from DSAM in (α,pγ).
3276.2 *4*	$3/2^+$	0.14 ps *3*	A D FGHI	XREF: I(3250). J$^\pi$: L(pol d,^{3}He)=2 and L-1/2 transfer from analyzing power. $T_{1/2}$: from DSAM in (t,pγ).
3490.58 *24*	$5/2^+$	63 fs *14*	ABCDEFGHIJ	XREF: I(3480). J$^\pi$: L(pol d,^{3}He)=2 and L+1/2 transfer from analyzing power. $T_{1/2}$: from τ=91 fs *20*, weighted average of 43 fs *33* (1973Ca20) from (α,pγ), 90 fs *20* (1973Po03) and 110 fs *20* (1973Wa14) from (t,pγ), all by

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Adopted Levels, Gammas (continued)

^{33}P Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
				DSAM.
3627.9 *4*	7/2$^+$	151 fs *28*	ABCDEFGH J	Jπ: spin=7/2 from pγ(θ) in (t,pγ) and (α,pγ); L(d,^{3}He)=4 from 0$^+$. $T_{1/2}$: τ=218 fs *40*, weighted average of 160 fs *56* (1973Ca20) from (α,pγ), 260 fs *40* (1973Po03) and 170 fs *80* (1973Wa14) from (t,pγ).
4048.3 *5*	5/2$^+$	59 fs *21*	AB D FGHI	Jπ: L(pol d,^{3}He)=2 and L+1/2 transfer from analyzing power.
4192.3 *20*	5/2$^+$	104 fs *35*	A FG	XREF: F(4181). Jπ: spin=5/2 from pγ(θ) in (t,pγ); 4194γ E2(+M3) to 1/2$^+$.
4226.19 *21*	7/2$^-$	0.32 ps *7*	ABCDEFG J	XREF: D(4231). Jπ: spin=7/2 from pγ(θ) in (t,pγ) and γγ(θ)(DCO) in (^{18}O,p2nγ); L(t,p)=3 from 1/2$^+$.
4856.0 *11*	3/2,5/2$^{(+)}$	<76 fs	AB D FG	Jπ: spin=3/2,5/2 from pγ(θ) and pγγ(θ) in (t,pγ); 4855γ to 1/2$^+$.
5050 *4*	5/2$^+$		d f hI	XREF: d(5045)f(5039)h(5060). E(level): from (pol d,^{3}He). Possible doublet around this energy. See comments at 5053 level. Jπ: L(pol d,^{3}He)=2 and L+1/2 from analyzing power. See also comments at 5053 level.
5053.4 *11*	3/2$^+$	<62 fs	AB d fGh	XREF: d(5045)f(5039)h(5060). Jπ: pγ(θ) of 5048γ in (t,pγ) gives J=3/2 with 5/2 clearly excluded, but it contradicts 5/2$^+$ from L(pol d,^{3}He)=2 which well fits measured σ(θ) with L+1/2 from measured analyzing power. This contradiction may imply a doublet around this energy, with 5/2$^+$ and 3/2$^+$ components.
5190.5 *14*	(5/2$^+$)	<0.13 ps	AB D FG	XREF: F(5177). Jπ: spin=3/2,5/2 from pγγ(θ) of 3758γ in (t,pγ); possible 966γ to 7/2$^-$ and possible 1563γ to 7/2$^+$; possible 5190γ to 1/2$^+$. Other: (13/2,15/2$^-$) from a very poor DWBA fit in (α,p) for a group at 5190, which is unlikely to be a different level due to non-observation in other studies.
5406.0 *25*	(7/2$^+$)	<76 fs	B d fG	XREF: d(5411)f(5410). Jπ: spin=(7/2) from 3558γ(θ) in (^{18}O,p2nγ); 2867γ to 3/2$^+$.
5415.7 *26*			B d f	XREF: d(5411)f(5410).
5452.68 *26*	9/2$^-$	24 ps *5*	BCDEFG J	XREF: F(5438). Jπ: from pγ(θ) and γγ(lin pol) in (α,pγ), γγ(θ)(DCO) in (^{18}O,p2nγ). $T_{1/2}$: from RDM in (α,pγ). Other: >1.3 ps from DSAM in (t,pγ).
5500.9 *6*	(3/2$^-$ to 9/2$^+$)	<62 fs	B D FG	XREF: D(5504)F(5485). Jπ: 3652.8γ to 5/2$^+$, 1274.7γ to 7/2$^-$. Additional information 2.
5547.3 *21*		0.33 ps *12*	fG	XREF: f(5535). Jπ: 1355γ to 5/2$^+$.
5557.4 *24*	3/2	<56 fs	D fG	XREF: f(5535). Jπ: from pγ(θ) of 5557γ in (t,pγ).
5638.27 *27*	11/2$^-$	9.7 ps *14*	BC EFG J	XREF: F(5619). Jπ: from pγ(θ) and γγ(lin pol) in (α,pγ); 1412γ E2, ΔJ=2 to 7/2$^-$. $T_{1/2}$: from DSAM in (α,pγ).
5674.1 *30*	1/2$^+$	<49 fs	D FG I	XREF: D(5663)F(5650)I(5650). Jπ: L(t,p)=0 from 1/2$^+$ for 5650 *20* group; spin=1/2,3/2 from pγ(θ) of 5674γ in (t,pγ).
5728.8 *25*	(7/2)		B	Jπ: proposed by 2018Lu08 in (^{18}O,p2nγ) based on theoretical predictions and 3881γ to 5/2$^+$.
5730	3/2		D FG	XREF: D(5731)F(5730).

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Adopted Levels, Gammas (continued)

^{33}P Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$[‡]	XREF	Comments
				Additional information 3.
				E(level): from (t,pγ).
				J$^{\pi}$: from p$\gamma(\theta)$ of 5730γ in (t,pγ).
5785.1 *30*	(1/2,3/2,5/2$^+$)	<35 fs	d fG	XREF: d(5795)f(5783).
				J$^{\pi}$: 5784.6γ to 1/2$^+$.
5810.1 *26*	(1/2 to 7/2$^+$)		B d f	XREF: d(5795)f(5783).
				J$^{\pi}$: 3271γ to 3/2$^+$.
5814.6 *13*	(3/2$^+$,5/2,7/2$^+$)	76 fs *42*	G	J$^{\pi}$: 4381.5γ to 3/2$^+$ and 2186.8γ to 7/2$^+$.
5925.8 *26*	(7/2)		B D F i	XREF: i(5956).
				J$^{\pi}$: proposed by 2018Lu08 in (^{18}O,p2nγ) based on theoretical predictions.
5972.6 *30*	(1/2,3/2,5/2$^+$)	<56 fs	d fG i	XREF: d(5985)f(5990)i(5956).
				E(level): 1973Po03 in (t,pγ) show two levels near this energy: 5930 and 5990; the first one with a possible transition to the g.s., the second with a transition to 1850 level and a possible transition to g.s. Based on the data from 1973Po02, the evaluators adopt only one level, but it is possible that there are two levels near this energy.
				J$^{\pi}$: 5972γ to 1/2$^+$.
5991.6 *30*			B d f	XREF: d(5985)f(5990).
				J$^{\pi}$: (1/2$^+$ to 9/2$^+$) from 4143.6γ to 5/2$^+$.
6114.7 *21*		<0.14 ps	FG	XREF: F(6110).
				J$^{\pi}$: (1/2$^+$ to 9/2$^+$) from 1923.3γ to 5/2$^+$.
6125 *5*	(1/2,3/2,5/2$^+$)	55 fs *42*	G	J$^{\pi}$: 6124γ to 1/2$^+$.
6182.3 *35*	(1/2$^+$,3/2,5/2$^+$)	<62 fs	D G	J$^{\pi}$: 6181.7γ to 1/2$^+$; possible 2134γ to 5/2$^+$.
6325.1 *30*			B D	XREF: D(6327).
				J$^{\pi}$: (1/2$^+$ to 9/2$^+$) from 4477γ to 5/2$^+$.
6423.8 *23*	(5/2)$^+$		B D I	XREF: I(6449).
				J$^{\pi}$: L(pol d,^{3}He)=2 from 1/2$^+$, with L+1/2 transfer assumed.
6502.5 *28*	(1/2 to 7/2$^+$)		B D	XREF: D(6509).
				J$^{\pi}$: 3963.6γ to 3/2$^+$.
6518.6 *11*	(13/2,15/2$^-$)		C	J$^{\pi}$: from 880.3γ to 11/2$^-$ and tendency of fusion-evaporation reactions suggesting spin increasing as energy.
6555.4 *24*			B D	XREF: D(6559).
6625.4 *28*	(1/2 to 7/2$^+$)		B	J$^{\pi}$: 4086.5γ to 3/2$^+$.
6807.9 *7*	(9/2)		BC	J$^{\pi}$: (7/2$^-$,9/2,11/2$^-$) from 1169.2γ to 11/2$^-$ and 2582.1γ to 7/2; 9/2 proposed in (^{18}O,p2nγ) based on theoretical predications.
6820 *60*	5/2$^+$		d I	XREF: d(6940).
				J$^{\pi}$: L(pol d,^{3}He)=2 and L+1/2 transfer from analyzing power.
6936.3 *4*	(13/2$^-$)		BC	J$^{\pi}$: (9/2,13/2) from $\gamma\gamma(\theta)$ in (^{13}C,αpnγ) and $\gamma(\theta)$ in (^{18}O,p2nγ); tendency of fusion evaporation reactions to populate higher-lying high-spin states suggests J=13/2; 1484.2γ to 9/2$^-$.
6987.6 *5*	(7/2$^-$,9/2,11/2$^-$)		BCd	XREF: d(6940).
				J$^{\pi}$: 1349.4γ to 11/2$^-$, 2761.0γ to 7/2$^-$.
7146 *12*	5/2$^+$		I	J$^{\pi}$: L(pol d,^{3}He)=2 and L+1/2 transfer from analyzing power.
7.31×10^3 *15*	(9/2,11/2,13/2$^+$)[#]		D	
7564 *34*			D I	XREF: D(7620).
				E(level): from (pol d,^{3}He). Other: 7.62E3 *15* from (α,p).
				J$^{\pi}$: (1/2,3/2$^+$) for a complex group at 7620 *150* in (α,p).
7997.6 *20*			B d	XREF: d(8080).
				J$^{\pi}$: 2359.2γ to 11/2$^-$; (9/2,11/2) from DWBA analysis for a group at 8080 *150* in (α,p).
8085.6 *17*	(13/2)		B d	XREF: d(8080).
				J$^{\pi}$: 2448γ to 11/2$^-$, 2632γ to 9/2$^-$; (13/2) proposed by

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Adopted Levels, Gammas (continued)

^{33}P Levels (continued)

E(level)[†]	Jπ	XREF	Comments
			2018Lu08 in (^{18}O,p2nγ) based on theoretical predictions; (9/2,11/2) from DWBA analysis for a group at 8080 *150* in (α,p).
8510 *24*		I	
8.85×10^3 *15*	(3/2$^+$,5/2,7/2)[#]	D	
9078.2 *5*	(11/2)	BC	Jπ: (7/2,11/2,15/2) from γγ(θ) in (^{13}C,αpnγ); 2090.6γ D(+Q) to (7/2$^-$,9/2,11/2$^-$); 3440γ to 11/2$^-$; 2141.6γ to (13/2).
9.94×10^3 *15*		D	Jπ: (1/2 to 11/2) from DWBA analysis in (α,p).
10105.9 *6*	(9/2$^-$,13/2)	BCD	XREF: D(10120). Jπ: (5/2,9/2,13/2,17/2) from γγ(θ) in (^{13}C,αpnγ); 1027.6γ, ΔJ=1 to (11/2); 3169.7γ to (13/2$^-$).

[†] From a least-squares fit to Eγ values with uncertainties for levels connected with γ transitions and from particle-transfer reactions for other levels, unless otherwise noted.
[‡] From DSAM in (t,pγ), unless otherwise noted. Weighted averages are taken when values are also available from DSAM in (α,pγ).
[#] From DWBA analysis of σ(θ) data for a complex group in (α,p).

Adopted Levels, Gammas (continued)

$\gamma(^{33}P)$

Additional information 4.

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
1431.72	$3/2^+$	1431.7 *2*	100	0.0	$1/2^+$	M1+E2	−0.58 *11*	6.57×10^{-5} *18*	B(M1)(W.u.)=0.0131 *+28−22*; B(E2)(W.u.)=8.8 *+31−26* E_γ: weighted average of 1431.8 *4* from (^{18}O,p2nγ), 1431.6 *3* from (^{13}C,αpnγ), 1431.8 *2* from (α,pγ), and 1431.5 *3* from (t,pγ). Mult.: also from $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(lin pol) in (^{18}O,p2nγ). δ: weighted average of −0.63 *17* (1968Mo16) and −0.58 *11* (1969Ha40) in (α,pγ), and −0.58 *+25−30* in (1970Ha48) in (t,pγ).
1847.72	$5/2^+$	416.0 *2*	7.0 *1*	1431.72	$3/2^+$	M1(+E2)	+0.09 *18*		B(M1)(W.u.)=0.025 *5*; B(E2)(W.u.)<49 E_γ: weighted average of 416.1 *4* from (^{18}O,p2nγ), 415.9 *2* from (^{13}C,αpnγ), and 416.3 *3* from (t,pγ). I_γ: from (^{13}C,αpnγ). Others: 6.7 *6* from ^{33}Si β^- decay, 10.0 *30* from (^{18}O,p2nγ), 6.4 *21* from (α,pγ), and 8.7 *22* from (t,pγ). Mult.: D(+Q) from p$\gamma(\theta)$ in (t,pγ); M1+E2 from $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(lin pol) in (^{18}O,p2nγ).
		1847.66 *16*	100.0 *5*	0.0	$1/2^+$	E2		2.51×10^{-4} *4*	B(E2)(W.u.)=5.0 *+8−6* E_γ: weighted average of 1847.8 *4* from (^{18}O,p2nγ), 1847.5 *3* from (^{13}C,αpnγ), 1847.9 *2* from (α,pγ), and 1847.52 *16* from (t,pγ). I_γ: from (^{13}C,αpnγ). Others: 100.0 *10* from ^{33}Si β^- decay, 100.0 *20* from (^{18}O,p2nγ), 100.0 *21* from (α,pγ), and 100.0 *22* from (t,pγ). Mult.: δ(O/Q)=−0.06 *4* or −2.4 *3* from p$\gamma(\theta)$ in (α,pγ) and (t,pγ); O component (E3 or M3) is ruled out by RUL; E2 also from $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(lin pol) in (^{18}O,p2nγ).
2538.60	$3/2^+$	690.9 *4*	8.2 *12*	1847.72	$5/2^+$	[M1+E2]			B(M1)(W.u.)=0.12 *+8−4* if M1. B(E2)(W.u.)=1.0×10^3 *+7−3* exceeds RUL=100 if E2. E_γ: weighted average of 690.4 *10* from (^{18}O,p2nγ) and 691.0 *4* from (t,pγ). I_γ: other: 31 *4* from (^{18}O,p2nγ) is discrepant.
		1106.8 *3*	9.4 *12*	1431.72	$3/2^+$	[M1+E2]		2.8×10^{-5} *4*	B(M1)(W.u.)=0.09 *+8−4* if M1. B(E2)(W.u.)=2.9×10^2 *+26−15* exceeds RUL=100 if E2. E_γ: other: 1106.4 *15* from (^{18}O,p2nγ). I_γ: other: 40.4 *21* from (^{18}O,p2nγ) is discrepant.
		2538.7 *7*	100 *4*	0.0	$1/2^+$	M1+E2	+0.16 *4*	4.80×10^{-4} *7*	B(M1)(W.u.)=0.028 *+18−9*; B(E2)(W.u.)=0.46 *+45−22*

$^{33}_{15}P_{18}$-5

Adopted Levels, Gammas (continued)

γ(^{33}P) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
									E_γ: unweighted average of 2539.2 *20* from (^{18}O,p2nγ), 2539.7 *5* from (α,pγ), and 2537.3 *5* from (t,pγ). I_γ: also from (^{18}O,p2nγ). Mult.,δ: from (α,pγ).
3276.2	3/2$^+$	737.6	<5.8	2538.60	3/2$^+$	[M1,E2]			B(M1)(W.u.)<0.016 if M1. B(E2)(W.u.)<117 upper limit exceeds RUL=100 if E2.
		1428.6 *4*	100 *6*	1847.72	5/2$^+$	(M1+E2)		7.0×10^{-5} *11*	Mult.: D+Q from pγ(θ) in (t,pγ); Δπ=no from level scheme. B(M1)(W.u.)=0.027 *+8−5* if M1, B(E2)(W.u.)=54 *+15−10* if E2.
		1844.4	<9.6	1431.72	3/2$^+$	[M1,E2]		2.21×10^{-4} *29*	B(M1)(W.u.)<0.0016 if M1, B(E2)(W.u.)<1.9 if E2.
		3275.1 *10*	92 *6*	0.0	1/2$^+$	(M1+E2)		8.4×10^{-4} *7*	Mult.: D+Q from pγ(θ) in (t,pγ); Δπ=no from level scheme. B(M1)(W.u.)=0.0021 *+6−4* if M1, B(E2)(W.u.)=0.79 *+22−14* if E2.
3490.58	5/2$^+$	214.4	<6.1	3276.2	3/2$^+$	[M1,E2]		0.0037 *29*	B(M1)(W.u.)<1.5 if M1. B(E2)(W.u.) upper limit exceeds RUL=100 if E2.
		951.97	<6.1	2538.60	3/2$^+$	[M1,E2]			B(M1)(W.u.)<0.017 if M1, B(E2)(W.u.)<77 if E2.
		1642.7 *3*	100.0 *22*	1847.72	5/2$^+$	(M1(+E2))	+0.9 *12*	1.39×10^{-4} *15*	B(M1)(W.u.)=0.022 *+34−17*; B(E2)(W.u.)<69 E_γ: others: 1643.0 *10* from (^{18}O,p2nγ) and 1642.6 *4* from (^{13}C,αpnγ). I_γ: from (^{13}C,αpnγ). Others: 100 *4* from (^{18}O,p2nγ), 100 *25* from (α,pγ), and 100 *6* from (t,pγ). Mult.: D(+Q) from pγ(θ) in (t,pγ); Δπ=no from level scheme. δ: deduced from −0.27<δ<+2.1 (1973Po03) in (t,pγ).
		2058.8 *4*	76 *4*	1431.72	3/2$^+$	M1+E2	−0.17 *10*	2.80×10^{-4} *5*	B(M1)(W.u.)=0.0152 *+44−29*; B(E2)(W.u.)<1.1 E_γ: weighted average of 2058.8 *10* from (^{18}O,p2nγ), 2058.5 *8* from (^{13}C,αpnγ), and 2058.9 *4* from (t,pγ). I_γ: weighted average of 64 *12* from (^{18}O,p2nγ), 73.6 *25* from (^{13}C,αpnγ), and 90 *6* from (t,pγ), and 67 *25* from (α,pγ). δ: weighted average of −0.14 *10* from (α,pγ) and −0.37 *28* from (t,pγ).
		3490.5 *10*	12.1 *16*	0.0	1/2$^+$	E2(+M3)	+0.07 *7*	9.89×10^{-4} *16*	B(E2)(W.u.)=0.17 *+10−6* B(M3)(W.u.) upper limit exceeds RUL=10. E_γ: weighted average of 3490.9 *10* from (^{18}O,p2nγ) and 3490.1 *10* from (^{13}C,αpnγ). I_γ: unweighted average of 9.0 *4* from (^{18}O,p2nγ), 13.4 *15* from (^{13}C,αpnγ), and 14 *4* from (t,pγ).

$^{33}_{15}P_{18}$-6

Adopted Levels, Gammas (continued)

γ(^{33}P) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
3627.9	7/2$^+$	137.3	<5.7	3490.58	5/2$^+$	[M1]		2.21×10^{-3} *3*	B(M1)(W.u.)<2.7
		351.7	<8.6	3276.2	3/2$^+$	[E2]		1.02×10^{-3} *1*	B(E2)(W.u.) upper limit exceeds RUL=100.
		1089.3	<7.1	2538.60	3/2$^+$	[E2]			B(E2)(W.u.)<23
		1779.9 *6*	47 *4*	1847.72	5/2$^+$	M1+E2	−0.21 *10*	1.70×10^{-4} *4*	B(M1)(W.u.)=0.0074 *+17−13*; B(E2)(W.u.)=0.42 *+49−31* E_γ: weighted average of 1780.3 *10* from (^{18}O,p2nγ), 1780.1 *6* from (^{13}C,αpnγ), and 1779.3 *8* from (t,pγ). I_γ: unweighted average of 57.7 *23* from (^{18}O,p2nγ), 45 *5* from (^{13}C,αpnγ), 43 *29* from (α,pγ), and 43 *4* from (t,pγ). δ: from (α,pγ). Others: +0.01 *8* or −0.05 *+7−11* from (t,pγ).
		2196.1 *8*	100.0 *32*	1431.72	3/2$^+$	E2		4.18×10^{-4} *6*	B(E2)(W.u.)=7.4 *+18−12* E_γ: weighted average of 2196.5 *10* from (^{18}O,p2nγ), 2196.0 *8* from (^{13}C,αpnγ), and 2195.8 *10* from (t,pγ). I_γ: from (^{18}O,p2nγ). Others: 100 *5* from (^{13}C,αpnγ), 100 *29* from (α,pγ), and 100 *4* from (t,pγ). Mult.: Q, ΔJ=2 from γγ(θ)(DCO) in (^{18}O,p2nγ); M2 ruled out by RUL. δ(O/Q)=0.0 *1* from (α,pγ) and +0.03 *13* from (t,pγ).
		3627.7[a]	<1.4	0.0	1/2$^+$	[M3]		5.16×10^{-4} *7*	Considered as unlikely transition by the evaluators as implied Mult=M3 is not allowed by RUL. B(M3)(W.u.) upper limit exceeds RUL=10.
4048.3	5/2$^+$	420.4	<5.2	3627.9	7/2$^+$	[M1,E2]			B(M1)(W.u.)<0.36 if M1. B(E2)(W.u.) upper limit exceeds RUL=100 if E2.
		557.7	<5.2	3490.58	5/2$^+$	[M1,E2]			B(M1)(W.u.)<0.15 if M1. B(E2)(W.u.) upper limit exceeds RUL=100 if E2.
		772.1	9 *4*	3276.2	3/2$^+$	[M1+E2]			B(M1)(W.u.)=0.056 *+40−26* if M1. B(E2)(W.u.)=3.9×10^2 *+28−18* exceeds RUL=100 if E2.
		1509.5 *6*	6.2 *22*	2538.60	3/2$^+$	[M1,E2]		9.4×10^{-5} *14*	B(M1)(W.u.)=0.0052 *+34−21* if M1, B(E2)(W.u.)=9 *+6−4* if E2. E_γ: other: 1509.9 *19* from (^{18}O,p2nγ). I_γ: weighted average of 5.6 *14* from (^{18}O,p2nγ) and 14 *5* from (t,pγ).
		2200.5	<5.2	1847.72	5/2$^+$	[M1,E2]		3.8×10^{-4} *4*	B(M1)(W.u.)<0.0025 if M1, B(E2)(W.u.)<2.1 if E2.
		2616.5 *8*	100.0 *28*	1431.72	3/2$^+$	M1+E2	+0.19 *4*	5.14×10^{-4} *7*	B(M1)(W.u.)=0.016 *+8−4*; B(E2)(W.u.)=0.33 *+26−14* E_γ: other: 2616.2 *21* from (^{18}O,p2nγ). I_γ: from (^{18}O,p2nγ). Other: 100 *5* from (t,pγ). δ: from (t,pγ).
		4048.0	7 *4*	0.0	1/2$^+$	[E2]		1.19×10^{-3} *2*	B(E2)(W.u.)=0.08 *+7−4*
4192.3	5/2$^+$	2344.5	<5	1847.72	5/2$^+$	[M1,E2]		0.00044 *5*	B(M1)(W.u.)<0.0012 if M1, B(E2)(W.u.)<0.88 if E2.
		2760.5	<4	1431.72	3/2$^+$	[M1,E2]		0.00063 *6*	B(M1)(W.u.)<5.8×10^{-4} if M1, B(E2)(W.u.)<0.31 if E2.

$^{33}_{15}P_{18}$-7

Adopted Levels, Gammas (continued)

γ(^{33}P) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
4192.3	5/2$^+$	4193.5 *25*	100	0.0	1/2$^+$	E2(+M3)		1.23×10^{-3} *2*	B(E2)(W.u.)=0.64 *+32−16* if E2. B(M3)(W.u.)=2.5×10^5 *+13−7* exceeds RUL=10 if M3. Mult.: Q(+O) from pγ(θ) in (t,pγ); M2+E3 ruled out by RUL.
4226.19	7/2$^-$	735.4 *4*	8.84 *21*	3490.58	5/2$^+$	(E1)			B(E1)(W.u.)=0.00041 *+12−8* E_γ: unweighted average of 736.0 *5* from (^{18}O,p2nγ), 735.6 *3* from (^{13}C,αpnγ), and 734.7 *2* from (α,pγ). I_γ: weighted average of 8.58 *34* from (^{18}O,p2nγ), 8.90 *20* from (^{13}C,αpnγ), and 12.4 *23* from (α,pγ). Mult.: D, ΔJ=1 from γγ(θ)(DCO) in (^{18}O,p2nγ); Δπ=yes from level scheme.
		2378.4 *2*	100.0 *4*	1847.72	5/2$^+$	(E1(+M2))	+0.01 *8*	8.98×10^{-4} *14*	B(E1)(W.u.)=1.38×10^{-4} *+40−27*; B(M2)(W.u.)<1.2 E_γ: weighted average of 2378.7 *9* from (^{18}O,p2nγ), 2378.2 *5* from (^{13}C,αpnγ), 2378.5 *2* from (α,pγ), and 2377.0 *7* from (t,pγ). I_γ: from (^{13}C,αpnγ). Others: 100.0 *21* from (^{18}O,p2nγ) and 100.0 *23* from (α,pγ). Mult.,δ: D(+Q) from pγ(θ) in (t,pγ); Δπ=yes from level scheme.
		2794.4 *13*	1.03 *20*	1431.72	3/2$^+$	[M2]		3.94×10^{-4} *6*	B(M2)(W.u.)=0.52 *+18−13* E_γ: weighted average of 2794.6 *13* from (^{18}O,p2nγ) and 2794.1 *13* from (^{13}C,αpnγ). I_γ: weighted average of 0.85 *21* from (^{18}O,p2nγ) and 1.20 *20* from (^{13}C,αpnγ).
		4227.0 *15*	0.42 *21*	0.0	1/2$^+$	[E3]		9.63×10^{-4} *13*	B(E3)(W.u.)=9 *+6−5* E_γ,I_γ: from (^{18}O,p2nγ). Other: Iγ<4 from (t,pγ).
4856.0	3/2,5/2$^{(+)}$	629.8	<5	4226.19	7/2$^-$				
		663.7	<5	4192.3	5/2$^+$				
		807.7	<5	4048.3	5/2$^+$				
		1228.1	<5	3627.9	7/2$^+$				
		1365.4	<5	3490.58	5/2$^+$				
		1579.8	<3.8	3276.2	3/2$^+$				
		2317.3	<2.5	2538.60	3/2$^+$				
		3008.3 *12*	100 *5*	1847.72	5/2$^+$	D+Q			E_γ: other: 3008.5 *25* from (^{18}O,p2nγ). δ: −0.40<δ<0.40 or 2.5<δ<11.4 for J(4856)=5/2 (1973Po03) in (t,pγ).
		3424.1	<2.5	1431.72	3/2$^+$				
		4854.6 *30*	25 *5*	0.0	1/2$^+$				δ: <−8.1 or −1.57<δ<−0.22 or 0.22<δ<0.35 for J(4856)=5/2 (1973Po03).
5053.4	3/2$^+$	827.2	<4.1	4226.19	7/2$^-$				

$^{33}_{15}P_{18}$-8

Adopted Levels, Gammas (continued)

γ(^{33}P) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
5053.4	3/2$^+$	861.1	<4.1	4192.3	5/2$^+$				
		1005.1	<4.1	4048.3	5/2$^+$				
		1425.5	<14.3	3627.9	7/2$^+$				
		1562.8	<14.3	3490.58	5/2$^+$				
		1777.2	<14.3	3276.2	3/2$^+$				
		2514.7[#] *20*	10 *4*	2538.60	3/2$^+$	[M1,E2]		5.2×10^{-4} *5*	B(M1)(W.u.)>4.7×10^{-4} if M1, B(E2)(W.u.)>0.3 if E2. I_γ: other: I(2514.7γ)/I(3206.0γ)=0.3 *1*/2.5 *2*=9 *3*/71 *6* from (^{18}O,p2nγ) is in agreement.
		3206.0 *17*	71 *10*	1847.72	5/2$^+$	(M1(+E2))	−0.22 *65*	7.5×10^{-4} *5*	B(M1)(W.u.)>0.0014 E_γ: weighted average of 3206.5 *25* from (^{18}O,p2nγ) and 3205.7 *17* from (t,pγ). I_γ: other: I(3623.8γ)/I(3206.0γ)=1.3 *2*/2.5 *2*=37 *6*/71 *6* from (^{18}O,p2nγ). Mult.,δ: D(+Q) from (t,pγ); Δπ=no from level scheme.
		3623.8[#] *26*	25 *8*	1431.72	3/2$^+$	[M1,E2]		9.7×10^{-4} *7*	B(M1)(W.u.)>4.6×10^{-4} if M1, B(E2)(W.u.)>0.14 if E2. I_γ: other: I(3623.8γ)/I(3206.0γ)=1.3 *2*/2.5 *2*=37 *6*/71 *6* from (^{18}O,p2nγ) is in agreement within uncertainties.
		5048.3 *30*	100 *8*	0.0	1/2$^+$	(M1(+E2))	−0.8 *10*	0.00141 *6*	B(M1)(W.u.)>2.2×10^{-4} E_γ: this transition is only seen and reported as the strongest one from the 5050 level in 1973Po02 and 1973Po03 in (t,pγ), but not seen in other studies including a recent measurement of (^{18}O,p2nγ) by 2018Lu08, who however have seen 2514.7γ, 3206.5γ, and 3206.5γ from this 5050 level that are reported in 1973Po02 and 1973Po03 but didn′t address the non-observation of the 5058γ in their work. It is probable that the high energy of this transition is out of the detection range in other studies. Mult.: D(+Q) from pγ(θ) in 1973Po03; Δπ=no from level scheme. δ: deduced from −1.8<δ<0.02 (1973Po03) in (t,pγ).
5190.5	(5/2$^+$)	964.3	<6.4	4226.19	7/2$^-$				
		998.2	<6.4	4192.3	5/2$^+$				
		1142.2	<11.1	4048.3	5/2$^+$				
		1562.6	<11.1	3627.9	7/2$^+$				
		1699.9	<4.8	3490.58	5/2$^+$				
		1914.2	<11.1	3276.2	3/2$^+$				
		2652.8[#] *20*	21[#] *7*	2538.60	3/2$^+$	[M1,E2]		0.00058 *6*	I_γ: other: <11 from (t,pγ). B(M1)(W.u.)>5.2×10^{-4} if M1, B(E2)(W.u.)>0.3 if E2.
		3340.9 *28*	59 *6*	1847.72	5/2$^+$	[M1,E2]		0.00086 *7*	I_γ: other: 57 *22* from (^{18}O,p2nγ). B(M1)(W.u.)>9.8×10^{-4} if M1, B(E2)(W.u.)>0.36 if E2.

$^{33}_{15}P_{18}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{33}P)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
5190.5	(5/2$^+$)	3758.2 *25*	100 *6*	1431.72	3/2$^+$	(M1(+E2))	0.0 *3*	9.47×10^{-4} *18*	B(M1)(W.u.)>0.0011 E_γ: weighted average of 3757.8 *25* from (^{18}O,p2nγ) and 3758.8 *29* from (t,pγ). I_γ: other: 100 *22* from (^{18}O,p2nγ). Mult.,δ: D(+Q) from (t,pγ) for J(5191)=5/2; $\Delta\pi$=no from level scheme. B(E2)(W.u.) upper limit exceeds RUL=100.
		5190.1	<7.9	0.0	1/2$^+$	[E2]		1.54×10^{-3} *2*	
5406.0	(7/2$^+$)	2867.3	43 *14*	2538.60	3/2$^+$	[E2]		7.31×10^{-4} *10*	B(E2)(W.u.)>1.2
		3558.1 *25*	100 *14*	1847.72	5/2$^+$	(M1+E2)	+0.26 *25*	8.85×10^{-4} *24*	B(M1)(W.u.)>0.0031; B(E2)(W.u.)>1.2×10^{-4} E_γ: weighted average of 3558.6 *25* from (^{18}O,p2nγ) and 3557.4 *28* from (t,pγ). Mult.,δ: +0.01<δ(Q/D)<+0.51 for J(5407)=7/2 from (t,pγ); $\Delta\pi$=no from level scheme. ΔJ=1 from $\gamma(\theta)$ in (^{18}O,p2nγ).
5415.7		2877.0[#] *26*	100	2538.60	3/2$^+$				
5452.68	9/2$^-$	1226.5 *2*	100.0 *3*	4226.19	7/2$^-$	M1+E2	+0.9 *1*	3.27×10^{-5} *7*	B(M1)(W.u.)=2.5×10^{-4} *+7−5*; B(E2)(W.u.)=0.55 *+16−11* E_γ: weighted average of 1226.5 *6* from (^{18}O,p2nγ), 1226.3 *3* from (^{13}C,αpnγ), 1226.6 *2* from (α,pγ), and 1226.0 *5* from (t,pγ). I_γ: from (^{13}C,αpnγ). Other: 100.0 *22* from (^{18}O,p2nγ). Mult.: from p$\gamma(\theta)$ and $\gamma\gamma$(lin pol) in (α,pγ). δ: weighted average of +0.9 *1* in (α,pγ) and +1.0 *2* in (^{13}C,αpnγ).
		1824.6 *4*	8.8 *2*	3627.9	7/2$^+$	(E1)		5.22×10^{-4} *7*	B(E1)(W.u.)=3.6×10^{-7} *+10−6* E_γ: weighted average of 1825.3 *8* from (^{18}O,p2nγ) and 1824.4 *4* from (^{13}C,αpnγ). I_γ: weighted average of 9.1 *3* from (^{18}O,p2nγ) and 8.7 *2* from (^{13}C,αpnγ). Mult.: D, ΔJ=1 from $\gamma\gamma(\theta)$(DCO) in (^{18}O,p2nγ); $\Delta\pi$=yes from level scheme.
		3605.4 *10*	1.4 *4*	1847.72	5/2$^+$	[M2]		6.59×10^{-4} *9*	B(M2)(W.u.)=0.0026 *+11−8* E_γ: weighted average of 3605.8 *10* from (^{18}O,p2nγ) and 3604.5 *15* from (^{13}C,αpnγ). I_γ: weighted average of 1.5 *4* from (^{18}O,p2nγ) and 1.3 *4* from (^{13}C,αpnγ).
		4021.6[#] *17*	0.7[#] *4*	1431.72	3/2$^+$	[E3]		8.99×10^{-4} *13*	B(E3)(W.u.)=0.29 *+20−15*

$^{33}_{15}P_{18}$-10

Adopted Levels, Gammas (continued)

γ(^{33}P) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[&]	Comments
5500.9	(3/2$^-$ to 9/2$^+$)	1274.7 *6*	100 *11*	4226.19	7/2$^-$			E_γ: weighted average of 1276.7 *18* from (^{18}O,p2nγ) and 1274.5 *5* from (t,pγ). I_γ: other: I(1274.7γ)/I(3652.8γ)=77 *15*/100 *23* from (^{18}O,p2nγ) is discrepant.
		3652.8 *33*	21 *11*	1847.72	5/2$^+$			E_γ: weighted average of 3655.3 *25* from (^{18}O,p2nγ) and 3648.4 *33* from (t,pγ).
5547.3		1355.0 *6*	100	4192.3	5/2$^+$			
5557.4	3/2	1365.1		4192.3	5/2$^+$			
		3709.2 *30*	100 *20*	1847.72	5/2$^+$			
		4125.4		1431.72	3/2$^+$			
		5557.3 *40*	100 *20*	0.0	1/2$^+$			
5638.27	11/2$^-$	185.6[@] *3*	79.6 *23*	5452.68	9/2$^-$	(M1)	1.05×10^{-3} *2*	B(M1)(W.u.)=0.157 *+27−20* E_γ: others: 186.0 *8* from (^{18}O,p2nγ) and 185.4 *6* from (α,pγ). I_γ: weighted average of 73 *4* from (^{18}O,p2nγ), 79.9 *18* from (^{13}C,αpnγ), and 85 *4* from (α,pγ). Mult.: D, ΔJ=1 from γγ(θ)(DCO) in (^{18}O,p2nγ); Δπ=no from level scheme.
		1412.0 *2*	100.0 *23*	4226.19	7/2$^-$	E2	7.65×10^{-5} *11*	B(E2)(W.u.)=0.92 *+16−12* E_γ: from (α,pγ). Others: 1412.3 *7* from (^{18}O,p2nγ) and 1411.9 *4* from (^{13}C,αpnγ); 1420.8 *30* from (t,pγ) is discrepant. I_γ: from (^{13}C,αpnγ). Others: 100.0 *24* from (^{18}O,p2nγ) and 100 *4* from (α,pγ). Mult.: from pγ(θ) and γγ(lin pol) in (α,pγ) and also γγ(θ)(DCO) and γγ(lin pol) in (^{18}O,p2nγ).
5674.1	1/2$^+$	5673.6 *30*	100	0.0	1/2$^+$	[M1]	0.00151 *2*	B(M1)(W.u.)>0.0025
5728.8	(7/2)	3880.8[#] *25*	100	1847.72	5/2$^+$			
5730	3/2	5730	100	0.0	1/2$^+$			
5785.1	(1/2,3/2,5/2$^+$)	5784.6 *30*	100	0.0	1/2$^+$	[D,E2]		Mult.: M2 ruled out by RUL. B(E2)(W.u.)>0.4 if E2.
5810.1	(1/2 to 7/2$^+$)	3271.3[#] *26*	100	2538.60	3/2$^+$			
5814.6	(3/2$^+$,5/2,7/2$^+$)	2186.8 *14*	83 *28*	3627.9	7/2$^+$	[D,E2]		B(E2)(W.u.)=7 *+7−3* if E2.
		3966.6	100 *28*	1847.72	5/2$^+$	[D,E2]		B(E2)(W.u.)=0.44 *+40−18* if E2.
		4381.5 *34*	94 *28*	1431.72	3/2$^+$	[D,E2]		B(E2)(W.u.)=0.25 *+23−11* if E2.
5925.8	(7/2)	4077.8[#] *26*	100	1847.72	5/2$^+$			
5972.6	(1/2,3/2,5/2$^+$)	5972.0 *30*	100	0.0	1/2$^+$			
5991.6		4143.6[#] *30*	100	1847.72	5/2$^+$			
6114.7		1923.3 *20*	100 *18*	4192.3	5/2$^+$			
		2064.8 *26*	79 *18*	4048.3	5/2$^+$			

$^{33}_{15}P_{18}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{33}P)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
6114.7		2624.0		3490.58	$5/2^+$			
6125	(1/2,3/2,5/2$^+$)	6124 *5*	100	0.0	$1/2^+$	[D,E2]		Mult.: M2 ruled out by RUL. B(E2)(W.u.)=0.19 *+22−9* if E2.
6182.3	(1/2$^+$,3/2,5/2$^+$)	2134		4048.3	$5/2^+$			
		6181.7 *35*	100	0.0	$1/2^+$	[D,E2]		Mult.: M2 ruled out by RUL. B(E2)(W.u.)>0.16 if E2.
6325.1		4477.1[#] *30*	100	1847.72	$5/2^+$			
6423.8	(5/2)$^+$	2795.8 *23*	100	3627.9	$7/2^+$			
6502.5	(1/2 to 7/2$^+$)	3963.6 *28*	100	2538.60	$3/2^+$			
6518.6	(13/2,15/2$^-$)	880.3[@] *12*	100	5638.27	$11/2^-$			
6555.4		2927.4[#] *24*	100	3627.9	$7/2^+$			
6625.4	(1/2 to 7/2$^+$)	4086.5[#] *28*	100	2538.60	$3/2^+$			
6807.9	(9/2)	1169.2 *8*	100 *11*	5638.27	$11/2^-$			E_γ: weighted average of 1170 *1* from (^{18}O,p2nγ) and 1168.6 *8* from (^{13}C,αpnγ). I_γ: from (^{13}C,αpnγ). Other: 100 *40* from (^{18}O,p2nγ).
		2582.1 *14*	20 *5*	4226.19	$7/2^-$			E_γ: weighted average of 2586.2 *30* from (^{18}O,p2nγ) and 2581.6 *10* from (^{13}C,αpnγ). I_γ: from (^{13}C,αpnγ). Other: 80 *30* from (^{18}O,p2nγ) is discrepant.
6936.3	(13/2$^-$)	1297.9[@] *4*	100.0[@] *31*	5638.27	$11/2^-$	(E2(+M1))		E_γ: other: 1298.1 *10* from (^{18}O,p2nγ). Mult.,δ: δ(Q/D)=−18 *10* from 1298γ-1412$\gamma(\theta)$ and −2.6 *29* from 2091γ-1298$\gamma(\theta)$ for J(6936)=13/2 in (^{13}C,αpnγ); $\Delta\pi$=no from level scheme.
		1484.2[@] *9*	13.8[@] *29*	5452.68	$9/2^-$			
6987.6	(7/2$^-$,9/2,11/2$^-$)	1349.4[@] *10*	49[@] *10*	5638.27	$11/2^-$			
		1535.4[@] *11*	36[@] *7*	5452.68	$9/2^-$			
		2761.0[@] *11*	100[@] *11*	4226.19	$7/2^-$			E_γ: other: 2760.8 *19* from (^{18}O,p2nγ).
7997.6		2359.2[#] *20*	100	5638.27	$11/2^-$			
8085.6	(13/2)	2448.0[#] *22*	100[#] *30*	5638.27	$11/2^-$			
		2632.0[#] *24*	60[#] *30*	5452.68	$9/2^-$			
9078.2	(11/2)	2090.6[@] *5*	50.3[@] *29*	6987.6	(7/2$^-$,9/2,11/2$^-$)	D(+Q)	−0.1 *1*	Other: Eγ=2090.7 *15*, Iγ=50 *25* from (^{18}O,p2nγ). Mult.,δ: from $\gamma\gamma(\theta)$ in (^{13}C,αpnγ) for J(9078)=11/2 or 15/2.
		2141.7 *7*	100.0 *35*	6936.3	(13/2$^-$)			E_γ: weighted average of 2141.6 *10* from (^{18}O,p2nγ) and 2141.8 *7* from (^{13}C,αpnγ). I_γ: from (^{13}C,αpnγ). Other: 100 *50* from (^{18}O,p2nγ).
		2269.8[@] *12*	18.9[@] *29*	6807.9	(9/2)			

$^{33}_{15}P_{18}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{33}P)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
9078.2	(11/2)	3440[@] *2*	25.3[@] *25*	5638.27	11/2$^-$			
10105.9	(9/2$^-$,13/2)	1027.6[@] *3*	100.0[@] *18*	9078.2	(11/2)	D(+Q)	+0.1 *1*	Other: Eγ=1028.0 *10*, Iγ=100 *40* from (^{18}O,p2nγ). Mult.,δ: from $\gamma\gamma(\theta)$ in (^{13}C,αpnγ) for J(10106)=13/2 or 17/2; ΔJ=1 from $\gamma\gamma(\theta)$(DCO) in (^{18}O,p2nγ).
		3169.7 *12*	19.4 *15*	6936.3	(13/2$^-$)			Eγ: weighted average of 3170.3 *19* from (^{18}O,p2nγ) and 3169.4 *12* from (^{13}C,αpnγ). Iγ: from (^{13}C,αpnγ). Other: 29 *14* from (^{18}O,p2nγ).
		3587[@] *2*	13.4[@] *17*	6518.6	(13/2,15/2$^-$)			
		4468[@] *3*	5.7[@] *11*	5638.27	11/2$^-$			

† From (t,pγ), unless otherwise noted. Eγ values without uncertainties are deduced by the evaluators from level-energy differences.

‡ From p$\gamma(\theta)$ and p$\gamma\gamma(\theta)$ in (t,pγ) and/or (α,pγ), with electric or magnetic nature determined based on RUL and measured $T_{1/2}$ where available, unless otherwise noted.

From (^{18}O,p2nγ).

@ From (^{13}C,αpnγ).

& 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.

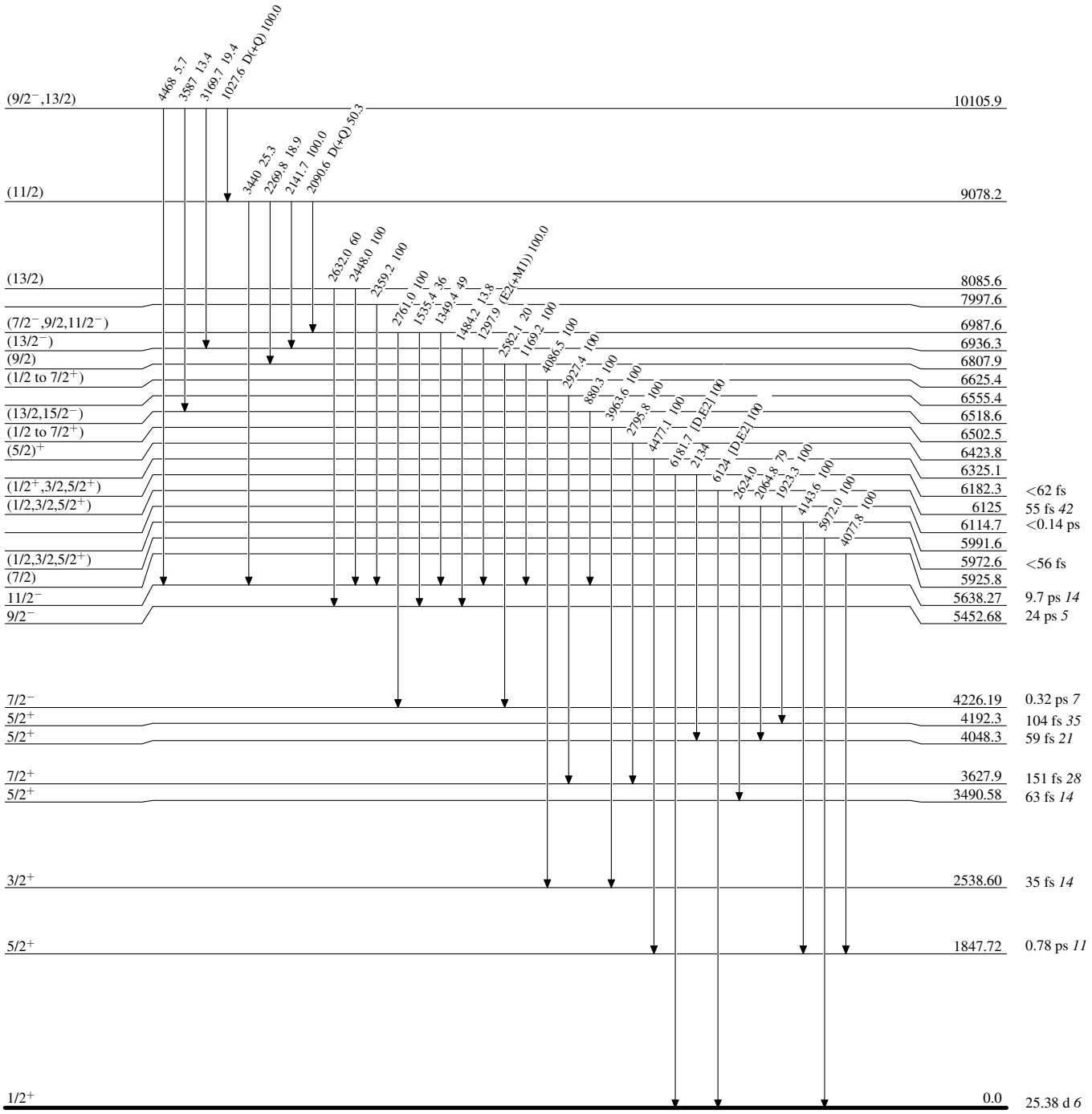
a Placement of transition in the level scheme is uncertain.

$^{33}_{15}P_{18}$-13

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

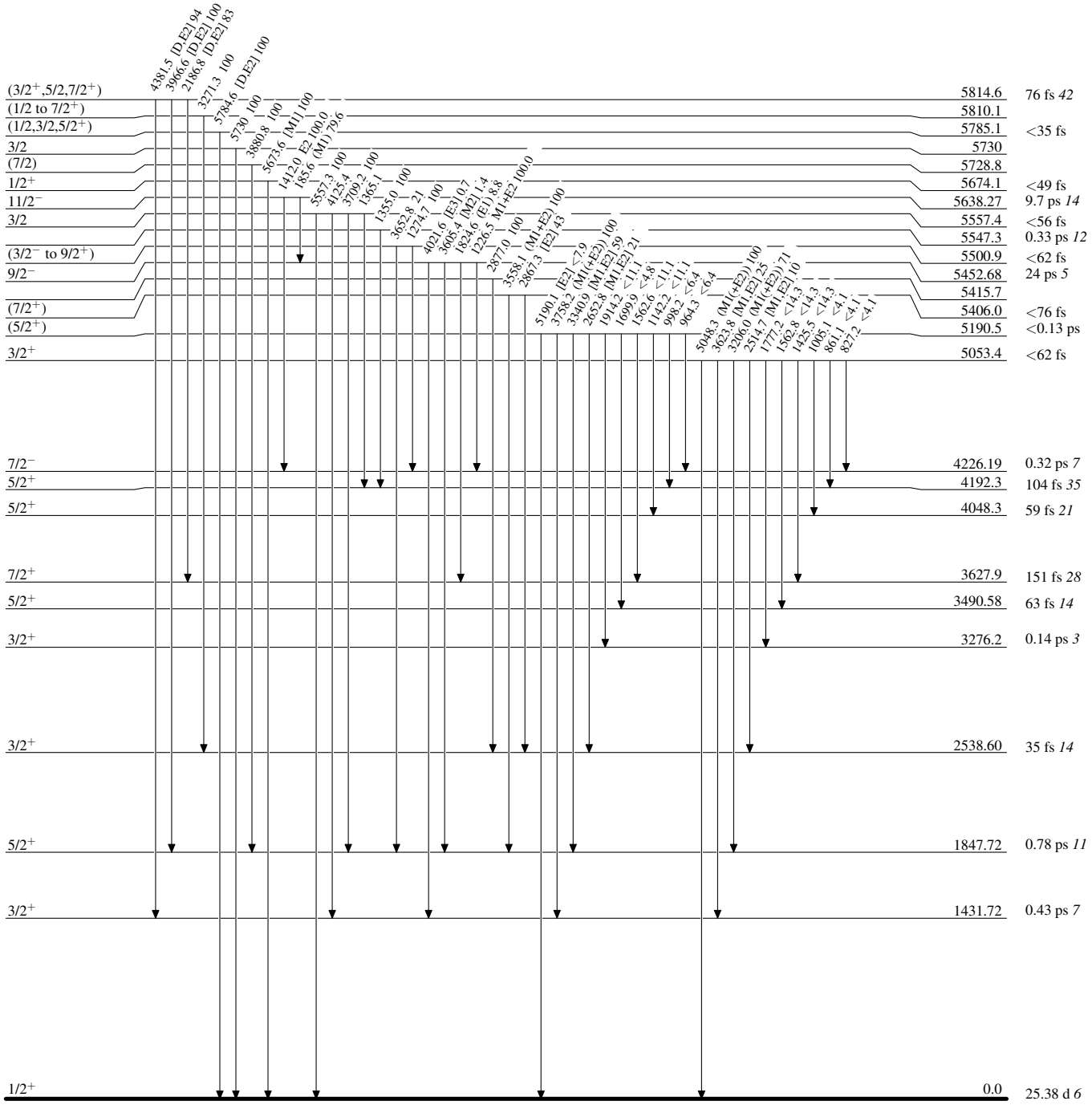


$^{33}_{15}P_{18}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{33}_{15}P_{18}$

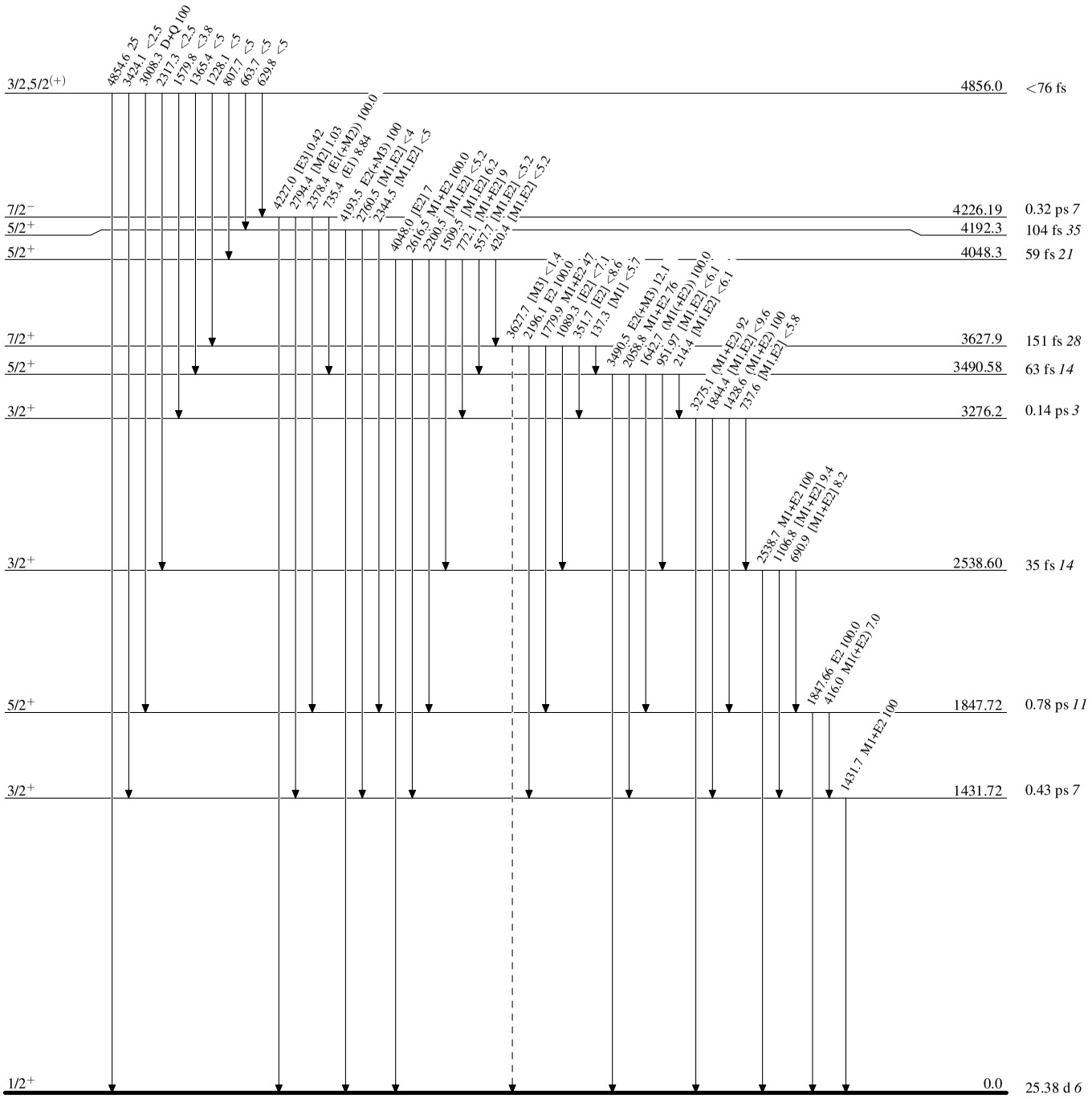
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{33}_{15}P_{18}$