^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

2014Mc08,2014McZZ: E(^{3}He)=9 MeV from the 12UD Pelletron tandem accelerator at the University of Tsukuba Tandem Accelerator Complex (UTTAC). Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$, $\gamma\gamma(\theta)$(DCO) using two HPGe detectors. Deduced levels, J, π, multipolarity.

1968Ve04: ^{28}Si(^{3}He,pγ): projectile E=6.2 MeV; annular surface barrier detector, NaI(Tl) detector; measured particle-γ-ray angular correlation, Eγ, Iγ, δ; deduced excited levels, J^{π}.

Others: 2020Lo11,1972La34.

All data are from 2014McZZ unless otherwise stated. In 2014Mc08, data are listed for only the selected levels in the 5595 keV to 6178 keV excitation region. 2014Mc08 is a conference paper related to the 2013 International Conference on Nuclear Data for Science and Technology. 2014McZZ contains the supplementary information of 2014Mc08 and submitted by the authors of 2014Mc08 to XUNDL.

^{30}P Levels

E(level)†	J^{π}‡	Comments
0	1^{+}	
677.10 *10*	0^{+}	
708.71 *7*	1^{+}	
1454.28 *5*	2^{+}	
1973.32 *8*	3^{+}	
2538.88 *18*	(3^{+})	
2723.63 *25*	2^{+}	
2839.40 *8*	(3^{+})	
2937.55 *9*	2^{+}	
3019.5 *8*	1^{+}	
3306.0 *6*	(3^{+})	
3734.07 *20*		
3835.85 *18*	2^{+}	
3928.69 *22*	3^{+}	1968Ve04 reports two additional γ decay branches from the level. These are 3220 keV and 3252 keV (extracted by the evaluators based on the level energy difference). The reported summed up branchings from the two transitions are 10 *6* (1968Ve04). The placement of 3252 keV γ decay branch looks to be suspicious based on the assigned J^{π} value of the level.
4142		E(level): from 1968Ve04. Not reported in 2014McZZ.
4182.95 *19*		
4231.90 *12*	4^{-}	E(level): 1968Ve04 placed two additional 2778 and 4231 keV γ transitions from the level; the placements of these transitions are suspicious based on the assigned J^{π} values of the decaying and feeding levels.
4298.8 *4*	4^{+}	
4344.10 *19*	5^{+}	
4423.0 *11*		
4468.56 *10*		
4502.66 *10*	1^{+}	
4626.00 *11*	3^{-}	E(level): 1968Ve04 placed an additional 3917 keV (extracted by the evaluators based on level energy difference) γ transition from the level; the placement of the transition is suspicious based on the assigned J^{π} values of the decaying and feeding levels.
4736.12 *21*	3^{+}	
4925.8 *3*	(3^{-},5^{-})	E(level): 1968Ve04 placed three additional decay branches from the level. The extracted energies of the corresponding transitions by the evaluators are 1988, 4217 and 4249 keV (based on the level energy differences). The placement of these transitions are suspicious based on the assigned J^{π} value of the level.
4937.8 *6*		
4946.3 *5*		
5026.5 *4*	(4^{-})	
5229.9 *5*		
5411.2 *3*	(2^{-},3^{+})	

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

^{30}P Levels (continued)

E(level)†	J$^{\pi}$‡	Comments
5506.6 *4*		J$^{\pi}$: 1^{-} assignment in 2020Lo11.
5508.75 *18*	(3)	
5573.5 *5*	2^{+}	
5595.7 *3*	4^{+}	J$^{\pi}$: 5^{+} assignment in 2020Lo11.
5599.28 *22*	4^{+}	
5701.2 *3*	1^{+}	
5716.0 *5*	(5^{+})	J$^{\pi}$: spin parity of (5^{+}) in 2014McZZ was proposed based on γ to 3^{+}, assuming the same level at 5719 in (^{3}He,t).
5717.0 *18*	1^{-}	J$^{\pi}$: 1^{-} from 2020Lo11, based on γ decaying to 0^{+}.
5788.8 *5*	(3^{+},4^{+})	J$^{\pi}$: 5^{+} assignment in 2020Lo11, γ to 2^{+} implies a less likely assignment.
5809.7 *4*		J$^{\pi}$: 2^{+} assignment in 2020Lo11; this assignment is suspicious due to the presence of γ decay branch to 5^{+} level.
5895.8 *6*	3^{+}	J$^{\pi}$: from 2020Lo11.
5909.1 *6*		J$^{\pi}$: 2^{-} assignment in 2020Lo11.
5934.43 *21*	4^{+}	J$^{\pi}$: from 2020Lo11. Other: (3^{+}) in 2014McZZ.
5996.80 *20*		J$^{\pi}$: 1^{-} assignment in 2020Lo11, appears that the authors assume to be the same level as 5993 with L=1 in (^{3}He,d) as mentioned in the adopted dataset.
6006.0 *5*		
6093.75 *12*	3^{-}	
6178.46 *16*	(5^{+})	J$^{\pi}$: evaluators′ note: 5^{+} is not completely ruled out by $\gamma(\theta)$ and DCO data; the J^{π} assignment of (6^{+}) by 2014Mc08 appears to be suspicious due to the placements of the two decay branches.
6229.0 *5*	(3^{+},5^{+})	
6269.2 *5*	(2^{-})	
6292.6 *4*	(3,4,5)	
6299.45 *22*		
6471.0 *6*		
6482.0 *20*		
6521.2 *11*		
6597.8 *4*		
6654.2 *9*		
6670.4 *12*		
6788.8 *6*		
6872.90 *12*	3^{+}	
6922.6 *14*		
6978.6 *7*	(3^{+})	
6982.5 *7*		
7015.8 *13*		
7045.2 *6*		
7051.9 *6*	4^{-}	
7120.3 *5*	(2^{+},3^{+})	J$^{\pi}$: (1^{+}) is also included in 2014McZZ, but γ to 4^{+} rules out 1^{+}.
7180.8 *19*		
7202.75 *22*	(6^{+},7^{+})	
7286.9 *5*	(2^{+})	J$^{\pi}$: 2014McZZ made a 2^{+} assignment; but the confirmed assignment can not be made following the results presented in 2014McZZ (Evaluators′ note).
7304.6 *22*		
7305.7 *6*	(2^{-})	
7324.9 *20*	(1^{-})	
7343.2 *8*	(5^{+},6^{+})	
7373.2 *6*	(2,3,4,5,6)	
7382.9 *20*		J$^{\pi}$: (1^{+}) in 2014McZZ, (2^{+},3^{+}) in adopted dataset.
7475.1 *20*		
7495.3 *20*		
7560.9 *7*		
7581.2 *11*	(2^{-})	
7601.4 *9*		
7638.0 *7*		J$^{\pi}$: 5^{+} proposed in 2020Lo11 for 3801.9γ Q feeding a 3^{+} state. The γ placement implies 4^{+}.

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

^{30}P Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	E(level)[†]
7644.5 6	(3+)	7799.2 7	7920.7 8
7687.7 7	(4−)	7891.9 20	7997.0 7
7757.0 8		7920.3 11	8012.2 9
			8248.3 6

† From least-squares fit to Eγ data.
‡ As proposed in 2014McZZ based on previous assignments and angular distribution/correlation data of 2014McZZ.

γ(^{30}P)

In 2014McZZ, DCO values are for 90° and 135° geometry. DCO(2) is for gate on ΔJ=2, quadrupole transition; DCO(1) for gate on ΔJ=1, dipole transition; and DCO(0) for gate on ΔJ=0, dipole transition. In dipole transition, there is possibility of quadrupole admixture if the transition is between the states of the same parity.
In 2020Lo11, the DCO values are typically 0.85 3 for ΔJ=1 transitions; the DCO values are typically 1.21 1 for ΔJ=2 transitions. These calibrated values are obtained by fitting the known transitions of ^{30}P from 2010Ba29.

E_i(level)	J_i^π	Eγ[†]	Iγ[@]	E_f	J_f^π	Mult.[&]	Comments
677.10	0+	677.1 1	100	0	1+	D	A_2=+0.14 1; A_4=+0.06 1; DCO(2)=1.17 3
708.71	1+	708.7 1	100	0	1+	D[a]	A_2=+0.21 8; A_4=+0.04 7; DCO(2)=1.18 2
1454.28	2+	745.5 4	9.0 4	708.71	1+	D	DCO(0)=0.86 5
		1454.24 5	91 4	0	1+	D	A_2=+0.49 1; A_4=−0.002 5; DCO(1)=1.17 3 δ: −1.2 < δ < −0.14 (1968Ve04).
1973.32	3+	519.0[‡]	<4	1454.28	2+		Iγ: from 1968Ve04.
		1264.4 3	59 5	708.71	1+	Q	A_2=+0.250 4; A_4=−0.062 4; DCO(0)=0.79 2 Iγ: from 1968Ve04. δ: −0.21 28 or −2.5 +12−15 (1968Ve04).
		1973.23 9	41 5	0	1+	Q	A_2=+0.25 3; A_4=−0.06 9; DCO(1)=1.75 3 Iγ: from 1968Ve04.
2538.88	(3+)	565.4[‡]	<10	1973.32	3+		Iγ: from 1968Ve04.
		1084.5[‡]	5 4	1454.28	2+		Iγ: from 1968Ve04.
		1830.2 5	<5	708.71	1+	(Q)	DCO(0)=0.9 1 Iγ: from 1968Ve04 (combined branching with 1862 keV γ ray).
		1861.6[‡]	<5	677.10	0+		Iγ: from 1968Ve04 (combined branching with 1830 keV γ ray). Mult.: Evaluators′ note: this transition may be suspected due to implied high multipolarity.
		2538.8 5	95 4	0	1+	Q	A_2=+0.22 7; A_4=−0.22 6; DCO(1)=1.71 4 Iγ: from 1968Ve04. δ: −0.23 +20−39 or −2.4 +7−20 (1968Ve04).
2723.63	2+	750.3[‡]		1973.32	3+		
		1269.3[‡]		1454.28	2+		
		2014.8 5	22.0 2	708.71	1+		
		2046.5[‡]		677.10	0+		
		2723.5 3	78 10	0	1+	D	A_2=+0.560 3; A_4=+0.190 2
2839.40	(3+)	1385.1 1	43 2	1454.28	2+	(D)	DCO(1)=0.97 3 Iγ: other: 28 4 (1968Ve04).
		2130.6 1	49 2	708.71	1+	Q	A_2=+0.30 1; A_4=−0.10 1; DCO(0)=0.99 2 δ: −0.03 +19−29 or −4.5 +26−15 (1968Ve04); Evaluators′

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

γ(^{30}P) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[&]	Comments
							note: probably a typo in quoting the higher δ value in Table 2 of 1968Ve04.
2839.40	(3+)	2839.3 *2*	8 *2*	0	1+		A_2=+0.47 *11*; A_4=−0.10 *17* (1968Ve04) I_γ: other: 22 *3*.
2937.55	2+	964.2 *2*	0.7 *2*	1973.32	3+		
		1483.1 *3*	46.8 *18*	1454.28	2+	D[a]	A_2=+0.18 2; A_4=−0.14 *1*; DCO(1)=1.50 *2*
		2228.7 *1*	7.5 *17*	708.71	1+	D	DCO(0)=1.7 *7*
		2260.4 *3*	30 *1*	677.10	0+	Q	DCO(1)=1.5 *1*
		2937.5 *5*	15.0 *14*	0	1+	D	DCO(0)=0.57 *8*
3019.5	1+	2342.3[c] *8*	100	677.10	0+	D	A_2=−0.74 *14*; A_4=−0.11 *23* (1968Ve04) DCO(1)=0.75 *6*
		3019.3[‡]	<1	0	1+		I_γ: from 1968Ve04.
3306.0	(3+)	2594 *3*	100	708.71	1+		
3734.07		796.5[‡]	7 *3*	2937.55	2+		I_γ: from 1968Ve04.
		2279.7[‡]	18 *6*	1454.28	2+		I_γ: from 1968Ve04.
		3056.8[‡]	29 *5*	677.10	0+		I_γ: from 1968Ve04.
		3733.8 *2*	46 *6*	0	1+		A_2=+1.16 *22*; A_4=−0.22 *31* (1968Ve04) The A_2 value in 1968Ve04 probably a typo; probably it would be A_2=+0.16 *22*.
3835.85	2+	898.2 *2*	60 *6*	2937.55	2+	D[a]	A_2=+0.250 *3*; A_4=−0.037 *3*; DCO(1)=1.7 *2* I_γ: from 1968Ve04.
		2381.5[‡]	16 *4*	1454.28	2+		I_γ: from 1968Ve04.
		3127.2 *3*		708.71	1+	D	DCO(0)=1.4 *1* E_γ: not seen by 1968Ve04.
		3158.6[‡]	18 *6*	677.10	0+		I_γ: from 1968Ve04.
		3835.6[‡]	6 *3*	0	1+		I_γ: from 1968Ve04.
3928.69	3+	991.1 *3*	63 *9*	2937.55	2+	D	A_2=+0.39 *9*; A_4=−0.06 *16* (1968Ve04) DCO(1)=1.0 *2*
		2474.4 *4*	37 *4*	1454.28	2+	D	DCO(1)=1.17 *4*
4142		2688[‡]	16 *5*	1454.28	2+		I_γ: from 1968Ve04.
		3433[‡]	14 *5*	708.71	1+		I_γ: from 1968Ve04.
		4142[‡]	70 *4*	0	1+		I_γ: from 1968Ve04.
4182.95		1245.4[‡]		2937.55	2+		
		1643.9 *5*	4 *1*	2538.88	(3+)		
		3474.3 *3*	75 *17*	708.71	1+		
		4182.7 *3*	21 *6*	0	1+		
4231.90	4−	1392.6 *2*	4 *2*	2839.40	(3+)	D	DCO(2)=0.40 *7*
		1693.0 *3*	24 *3*	2538.88	(3+)	D	DCO(2)=0.59 *2*
		2258.6 *3*	72 *3*	1973.32	3+	D	A_2=−0.220 *4*; A_4=−0.032 *3*; DCO(2)=0.53 *2*
4298.8	4+	2844.1 *12*	100	1454.28	2+	Q	DCO(1)=1.75 *2*
4344.10	5+	1804.9 *3*	5 *2*	2538.88	(3+)	Q	DCO(2)=1.00 *3*
		2370.3 *3*	95 *3*	1973.32	3+	Q	A_2=+0.32 *1*; A_4=−0.12 *1*; DCO(2)=1.07 *9*
4423.0		4422.7 *11*	100	0	1+		
4468.56		4468.2 *1*	100	0	1+		
4502.66	1+	1483.1[‡]		3019.5	1+		
		3048.3 *12*	88 *10*	1454.28	2+	D	A_2=+0.04 *13*; A_4=−0.10 *21* (1968Ve04) DCO(1)=1.18 *3*
		3793.7[‡]		708.71	1+		
		4502.3 *1*	12 *7*	0	1+		A_2=−0.01 *3*; A_4=−0.09 *5* (1968Ve04)
4626.00	3−	1688.4 *1*	30 *4*	2937.55	2+	D	DCO(1)=0.72 *9* A_2=+0.10 *27*; A_4=+0.42 *43* (1968Ve04)
		2652.5 *2*	16 *4*	1973.32	3+	D[a]	DCO(2)=1.0 *2*

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

γ(^{30}P) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[&]	Comments
4626.00	3⁻	3171.6 *6*	54 *3*	1454.28	2⁺	D	A_2=+0.27 *7*; A_4=−0.05 *11* (1968Ve04) DCO(1)=1.3 *3*
4736.12	3⁺	1798.5 *2*	58 *6*	2937.55	2⁺	D	DCO(1)=1.1 *1* A_2=−0.27 *7*; A_4=+0.14 *11* (1968Ve04) I_γ: from 1968Ve04.
		3281.5[c] *9*	18 *5*	1454.28	2⁺		I_γ: from 1968Ve04.
		4027.1[‡]	7.5 *25*	708.71	1⁺		I_γ: assuming half of the value as quoted in 1968Ve04.
		4058.7[‡]	7.5 *25*	677.10	0⁺		I_γ: assuming half of the value as quoted in 1968Ve04.
		4735.7[‡]	9 *5*	0	1⁺		I_γ: from 1968Ve04.
4925.8	(3⁻,5⁻)	627.0[c] *3*	7 *2*	4298.8	4⁺	(D)	DCO(0)=0.8 *3*
		693.8 *3*	81 *24*	4231.90	4⁻	D[a]	A_2=−0.17 *11*; A_4=−0.18 *10*; DCO(2)=1.22 *6*
		3470.4[c] *13*	12 *4*	1454.28	2⁺	(Q)	DCO(1)=1.75 *5* Mult.: evaluators′ note: the assigned multipolarity is suspicious based on the assigned spin-parity of the feeding level; presence of this decay nullifies the possibility of J^πi=5⁻ for the level as assigned in 2014McZZ.
4937.8		4260.5 *6*	100	677.10	0⁺		
4946.3		2972.5 *10*	100	1973.32	3⁺		
5026.5	(4⁻)	1720.3 *6*	19 *3*	3306.0	(3⁺)		
		2186.8 *7*	21 *8*	2839.40	(3⁺)		
		3053.3 *13*	33 *5*	1973.32	3⁺		
		3568[c] *3*	27 *3*	1454.28	2⁺	(Q)	DCO(1)=1.71 *2* Mult.: evaluators′ note: the assigned multipolarity is suspicious based on the assigned spin-parity of the feeding level.
5229.9		2389.8 *9*	33 *5*	2839.40	(3⁺)		
		3256.6 *5*	67 *1*	1973.32	3⁺		
5411.2	(2⁻,3⁺)	2473.7 *5*	30 *5*	2937.55	2⁺		
		2571.7 *6*	16 *8*	2839.40	(3⁺)		
		2872.1[c] *12*	27 *5*	2538.88	(3⁺)	(D)[b]	DCO(2)=0.9 *2*
		3437.6 *5*	27 *7*	1973.32	3⁺	(D)[b]	DCO(2)=0.7 *2*
5506.6		4829.1 *3*	100	677.10	0⁺		A_2=−0.21 *3*; A_4=+0.00 *3* (2020Lo11) DCO=0.85 *2* (2020Lo11) E_γ: other: 4829.1 *5* (2020Lo11).
5508.75	(3)	3535.2 *2*	57 *14*	1973.32	3⁺	D[a]	DCO(2)=0.6 *1* E_γ: weighted average of 3535.3 *2* (2014McZZ), 3535.0 *3* (2020Lo11).
		4054.3 *3*	43 *6*	1454.28	2⁺	D	DCO(1)=1.0 *1* A_2=−0.24 *4*; A_4=+0.09 *5* (2020Lo11) DCO=0.73 *5* (2020Lo11) E_γ: weighted average of 4054.1 *9* (2014McZZ), 4054.3 *3* (2020Lo11).
5573.5	2⁺	627.0[c] *3*	53 *11*	4946.3		(D,Q)	DCO(0)=0.8 *3*
		4122.5[#] *21*		1454.28	2⁺		
		4866.6 *13*	47 *6*	708.71	1⁺		A_2=−0.16 *41*; A_4=+0.01 *35* (2020Lo11) DCO=0.81 *12* (2020Lo11) E_γ: unweighted average of 4865.3 *2* (2014McZZ), 4867.9 *5* (2020Lo11).
5595.7	4⁺	569.3 *5*	20 *2*	5026.5	(4⁻)	D[a]	DCO(1)=1.5 *3*
		2659[c] *4*	8.0 *11*	2937.55	2⁺		
		2756.1 *13*	12 *4*	2839.40	(3⁺)		
		2872.1[c] *14*	60 *5*	2723.63	2⁺	Q	DCO(1)=1.4 *1*

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

γ(^{30}P) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[&]	Comments
5595.7	4+	3056.9[#] 3		2538.88	(3+)		A_2=+0.20 5; A_4=−0.04 6 (2020Lo11) DCO=1.16 11 (2020Lo11)
5599.28	4+	2661.6[#] 2		2937.55	2+		A_2=+0.04 2; A_4=−0.02 3 (2020Lo11) DCO=0.99 6 (2020Lo11)
5701.2	1+	1518.4 4	9.0 8	4182.95			A_2=−0.23 8; A_4=+0.02 10 (2020Lo11) DCO=0.70 19 (2020Lo11) E_γ: weighted average of 1518.5 3 (2014McZZ), 1518.3 2 (2020Lo11).
		2763.4 4	91 14	2937.55	2+	D	DCO(1)=1.3 3 A_2=−0.14 3; A_4=+0.08 6 (2020Lo11) DCO=0.68 4 (2020Lo11) E_γ: unweighted average of 2763.7 2 (2014McZZ), 2763.0 2 (2020Lo11).
		3161.6[#] 19		2538.88	(3+)		A_2=+0.29 7; A_4=+0.06 10 (2020Lo11) DCO=1.17 8 (2020Lo11)
5716.0	(5+)	3742.1 5	100	1973.32	3+	(Q)	DCO(2)=1.00 4
5717.0	1−	5039.4[#] 18		677.10	0+		A_2=−0.24 9; A_4=+0.02 12 (2020Lo11) DCO=0.92 10 (2020Lo11)
5788.8	(3+,4+)	1860.7 7	33 5	3928.69	3+	(D)[b]	DCO(2)=0.8 1
		2851 2	4 1	2937.55	2+		
		3064.3[c] 11	32 2	2723.63	2+		
		4334 2	31 5	1454.28	2+	(D,Q)	DCO(1)=1.3 4
5809.7		1463.8[c] 6	7 3	4344.10	5+		
		3270.9 7	28 4	2538.88	(3+)		A_2=−0.11 3; A_4=+0.01 4 (2020Lo11) DCO=0.86 3 (2020Lo11)
		3837.2 5	65 15	1973.32	3+		A_2=−0.17 7; A_4=+0.08 9 (2020Lo11) DCO=0.82 6 (2020Lo11) E_γ: weighted average of 3835.5 11 (2014McZZ), 3837.3 3 (2020Lo11).
5895.8	3+	869.0 5	5 2	5026.5	(4−)		
		1714.7 17	43 8	4182.95		(D)[a]	DCO(0)=0.84 4 A_2=−0.13 4; A_4=+0.08 5 (2020Lo11) DCO=0.78 3 (2020Lo11) E_γ: unweighted average of 1713.0 6 (2014McZZ), 1716.3 2 (2020Lo11).
		2959.3 14	52 11	2937.55	2+	(D)[a]	DCO(1)=1.3 3 A_2=+0.02 3; A_4=−0.07 4 (2020Lo11) DCO=0.93 5 (2020Lo11) E_γ: unweighted average of 2957.9 12 (2014McZZ), 2960.6 2 (2020Lo11).
5909.1		4451 2	21 4	1454.28	2+		
		5199.4[c] 10	79 24	708.71	1+		A_2=−0.20 9; A_4=−0.12 10 (2020Lo11) DCO=0.79 7 (2020Lo11) E_γ: weighted average of 5197.3 13 (2014McZZ), 5199.8 6 (2020Lo11).
5934.43	4+	1590.2 2		4344.10	5+	D+Q	A_2=+0.03 2; A_4=+0.03 3 (2020Lo11) DCO(2)=1.2 2 DCO=0.85 12 (2020Lo11) E_γ: weighted average of 1590.8 7 (2014McZZ), 1590.1 2 (2020Lo11). Mult.: based on the DCO and $\gamma(\theta)$ data of 2020Lo11.
		2996.6[#] 6		2937.55	2+	Q	A_2=+0.56 11; A_4=+0.14 11 (2020Lo11) DCO=1.06 12 (2020Lo11) Mult.: based on the DCO and $\gamma(\theta)$ data of 2020Lo11.

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

γ(^{30}P) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[&]	Comments
5934.43	4+	3095.0[#] 4		2839.40	(3+)		DCO=0.60 18 (2020Lo11) E_γ: uncertainty of 4.0 in 2020Lo11 − probably a typo, evaluators consider 0.4.
		3961.1[#] 4		1973.32	3+		A_2=−0.41 8; A_4=−0.04 11 (2020Lo11) DCO=0.98 10 (2020Lo11)
5996.80		5287.6 2		708.71	1+		DCO=1.10 12 (2020Lo11)
		5319.1 6		677.10	0+		DCO=0.94 6 (2020Lo11)
6006.0		3165 2	52 4	2839.40	(3+)		
		3467.0 5	48 4	2538.88	(3+)		A_2=+0.00 4; A_4=−0.09 5 (2020Lo11) DCO=1.12 11 (2020Lo11) E_γ: weighted average of 3467.3 5 (2014McZZ), 3466.4 7 (2020Lo11).
		4032.2[#] 8		1973.32	3+		DCO=1.30 37 (2020Lo11)
6093.75	3−	1467.7 1	59 7	4626.00	3−	D[a]	DCO(1)=1.5 3 A_2=+0.33 2; A_4=−0.02 2 (2020Lo11) DCO=1.37 5 (2020Lo11) E_γ: weighted average of 1467.5 3 (2014McZZ), 1467.7 1 (2020Lo11).
		1861.8 1	41 2	4231.90	4−	D	DCO(2)=0.7 3 E_γ: weighted average of 1861.2 5 (2014McZZ), 1861.8 1 (2020Lo11).
6178.46	(5+)	1946.5 1	75 9	4231.90	4−	(D)	A_2=+0.59 21; A_4=−0.10 18; DCO(2)=0.9 1 Mult.: ΔJ=(0,2) listed in 2014Mc08, but ΔJ^π requires D.
		2872.1[c] 12	25 5	3306.0	(3+)	(Q)	DCO(0)=0.9 2
6229.0	(3+,5+)	2300.4 5	65 19	3928.69	3+	(D,Q)	DCO(1)=1.3 4 Mult.: ΔJ=0, dipole or ΔJ=2 quadrupole.
		4255.5 7	35 7	1973.32	3+		
6269.2	(2−)	3545.3 4	100	2723.63	2+	(D)[a]	DCO(1)=1.57 2
6292.6	(3,4,5)	696.8 3	17 7	5595.7	4+		
		1266.1 5	83 11	5026.5	(4−)	(D)	DCO(2)=0.6 1
6299.45		3361.7 2	100	2937.55	2+		
6471.0		1525.3[c] 5	11 10	4946.3			
		1543.9 8	87 6	4925.8	(3−,5−)		
		4495.2 15	2.0 7	1973.32	3+		
6482.0		2299[c] 2	100	4182.95			
6521.2		3982 1	100	2538.88	(3+)		
6597.8		2299[c] 2	10 3	4298.8	4+		
		2365.7 6	4 1	4231.90	4−		
		2668.8 7	13 6	3928.69	3+		DCO(1)=1.4 7
		4624.2 5	73 11	1973.32	3+		DCO(2)=1.1 2
6654.2		2028.1 9	100	4626.00	3−		
6670.4		3830.7[c] 12	100	2839.40	(3+)		
6788.8		2162.3 11	67 20	4626.00	3−		
		4815.3 7	33 20	1973.32	3+		
6872.90	3+	2641.3 3	35 4	4231.90	4−		
		3568[c] 2	29 5	3306.0	(3+)	(D)	DCO(0)=0.8 2
		4899.1 1	36 3	1973.32	3+		
6922.6		3984.8 14	100	2937.55	2+		
6978.6	(3+)	1951.9 11	67 25	5026.5	(4−)	(D)	DCO(1)=0.98 6
		4439.4 7	33 6	2538.88	(3+)		
6982.5		1474.3 7	10 3	5508.75	(3)		
		2032 2	87 48	4946.3			
		3676 2	3 1	3306.0	(3+)		

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

γ(^{30}P) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[&]	Comments
7015.8		3281.5[c] *12*	100	3734.07			
7045.2		1039.2 *4*	100	6006.0			
7051.9	4^-	2025.3 *5*	100	5026.5	(4^-)	(D)[a]	DCO(1)=1.72 *4*
7120.3	$(2^+,3^+)$	1525.3[c] *5*	19 *4*	5595.7	4^+		
		4181.4 *6*	81 *20*	2937.55	2^+	(D)[b]	DCO(0)=0.6 *2*
7180.8		1463.8[c] *6*	100	5717.0	1^-		
7202.75	$(6^+,7^+)$	2858.5 *1*	100	4344.10	5^+	(D,Q)	DCO(2)=0.9 *2*
7286.9	(2^+)	2342.3[c] *8*	50 *3*	4946.3		(D)	DCO(1)=0.75 *6*
		3357.5 *4*	50 *12*	3928.69	3^+		
7304.6		1587.6[c] *12*	100	5717.0	1^-		
7305.7	(2^-)	1212.3 *6*	36 *5*	6093.75	3^-		
		1587.6[c] *12*	12 *5*	5717.0	1^-	[E3]	Mult.: evaluators′ note: this transition may be suspected due to implied high multipolarity.
		3470.4[c] *13*	52 *11*	3835.85	2^+	D[a]	DCO(1)=1.5 *5*
7324.9	(1^-)	4387 *2*	100	2937.55	2^+	D	DCO(2)=0.6 *1*
7343.2	$(5^+,6^+)$	1747.4 *7*	100	5595.7	4^+	(D,Q)	DCO(2)=1.0 *3*
7373.2	(2,3,4,5,6)	1463.8[c] *6*	21 *4*	5909.1			
		1584.5 *5*	89 *10*	5788.8	$(3^+,4^+)$	(D)	DCO(2)=1.5 *2*
7382.9		4445 *2*	100	2937.55	2^+	(D)	DCO(0)=0.5 *1*
7475.1		2849 *2*	100	4626.00	3^-		
7495.3		1778.3[c] *7*	100	5717.0	1^-		
7560.9		3261.9 *5*	100	4298.8	4^+		
7581.2	(2^-)	2955.0 *11*	100	4626.00	3^-	(D)	DCO(0)=1.1 *2*
7601.4		2654.9 *7*	100	4946.3			
7638.0		3801.9 *6*	100	3835.85	2^+	Q	A_2=+0.59 *9*; A_4=+0.03 *12* (2020Lo11) DCO=1.17 *8* (2020Lo11) E_γ: from 2020Lo11. Other: 3801.3 *13* (2014Mc08,2014McZZ). Placement from 2014Mc08,2014McZZ consistent with earlier work. In 2020Lo11, 3801.9 *9* γ is placed from 5775.9 (J^π=5^+) keV level − shown as the same level as 5788.8 of literature, where it does not fit well. The placement in 2014Mc08,2014McZZ appears to be more consistent. The evaluators consider this placement and avoid to include 5775.9 as a new level in ^{30}P.
7644.5	(3^+)	3461.6 *7*	39 *4*	4182.95			
		4706 *1*	61 *8*	2937.55	2^+	(D)	DCO(0)=0.75 *7*
7687.7	(4^-)	1459.1 *8*	35 *10*	6229.0	$(3^+,5^+)$	(D)	DCO(2)=0.5 *2*
		1778.3[c] *7*	34 *11*	5909.1			
		2659[c] *4*	31 *3*	5026.5	(4^-)		
7757.0		2809.1 *9*	59 *9*	4946.3			
		3830.7[c] *12*	41 *18*	3928.69	3^+		
7799.2		754.0 *3*	100	7045.2		D	DCO(1)=1.00 *7*
7891.9		5052 *2*	100	2839.40	(3^+)		
7920.3		3184[c] *1*	100	4736.12	3^+		
7920.7		3184[c] *1*	19 *4*	4736.12	3^+		
		5197.3[c] *13*	81 *24*	2723.63	2^+		
7997.0		3059.3 *7*	18 *6*	4937.8			
		4262.2 *9*	82 *10*	3734.07			
8012.2		3064.3[c] *11*	26 *10*	4946.3			
		3830.7[c] *12*	74 *3*	4182.95			
8248.3		1777.3 *1*	100	6471.0			

Continued on next page (footnotes at end of table)

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04 (continued)

γ(^{30}P) (continued)

† From 2014McZZ, except where otherwise noted.

‡ Reported in 1968Ve04, but not reported in 2014Mc08, 2014McZZ, not adopted if absent in other studies. Eγ calculated from level energy difference and recoil energy subtracted and omitted in the least squares fit to deduce the level energies.

From 2020Lo11.

@ From 2014McZZ, except where otherwise noted. The averages of the intensity values measured at 90° and 135° (2014McZZ).

& Mult=D indicates ΔJ=1, dipole or dipole+quadrupole transition unless otherwise stated. Mult=Q indicates ΔJ=2, quadrupole (most likely E2) transition.

[a] Mult=D indicates ΔJ=0, dipole or dipole with some quadrupole admixture.

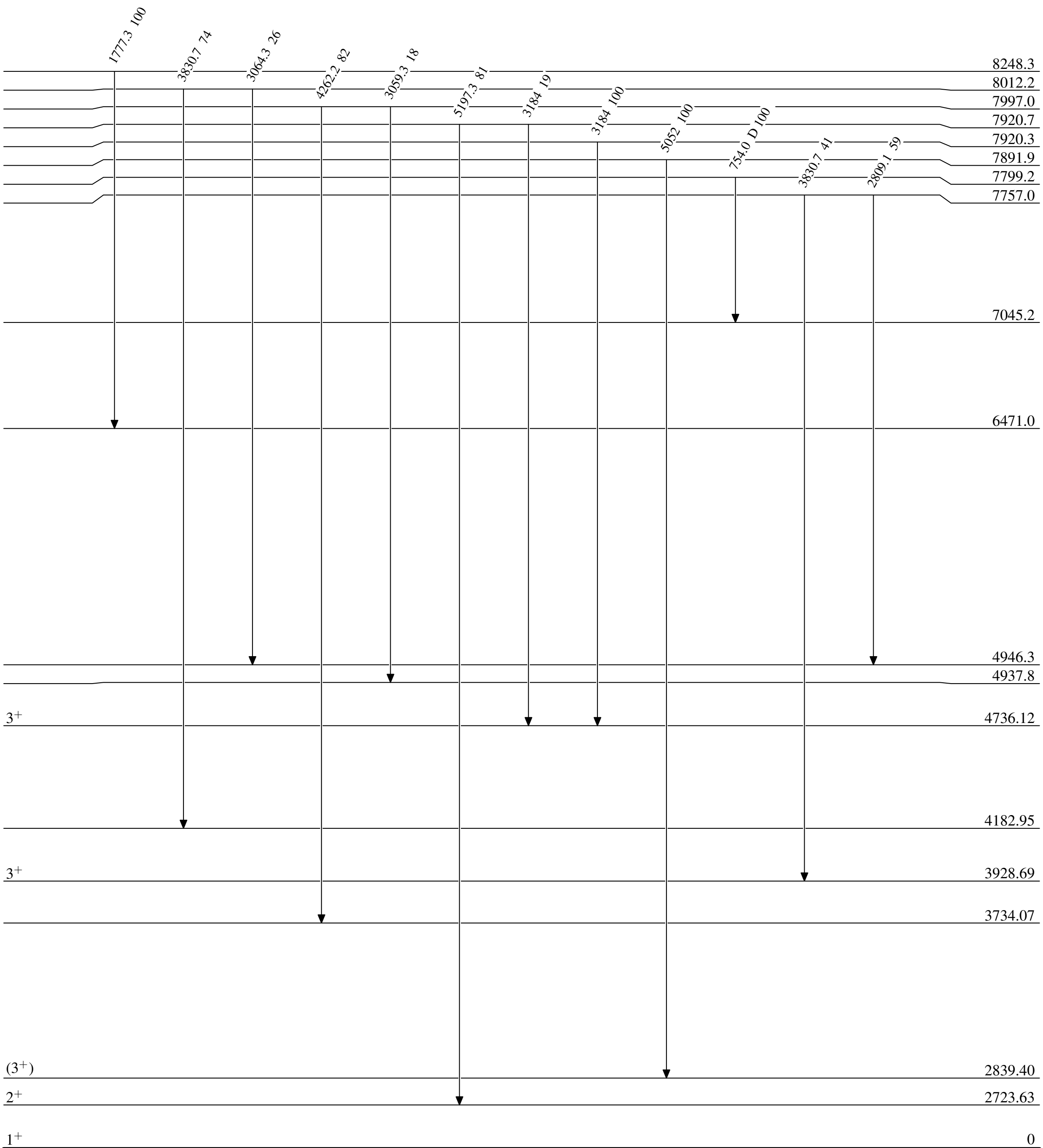
[b] Mult=D indicates ΔJ=0 or 1, dipole or dipole with some quadrupole admixture.

[c] Multiply placed.

$^{28}Si(^{3}He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme

Intensities: % photon branching from each level

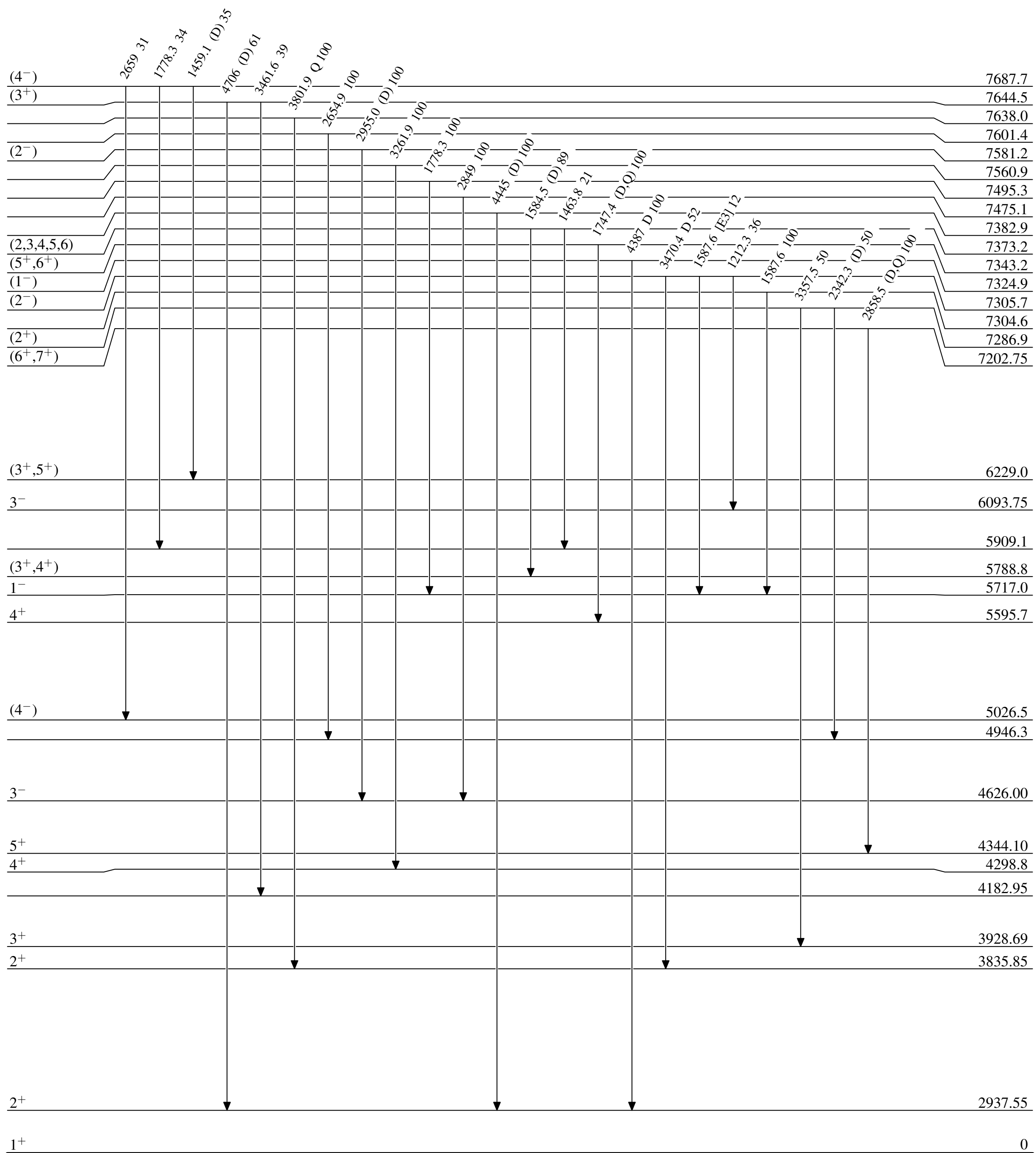


$^{30}_{15}P_{15}$

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level

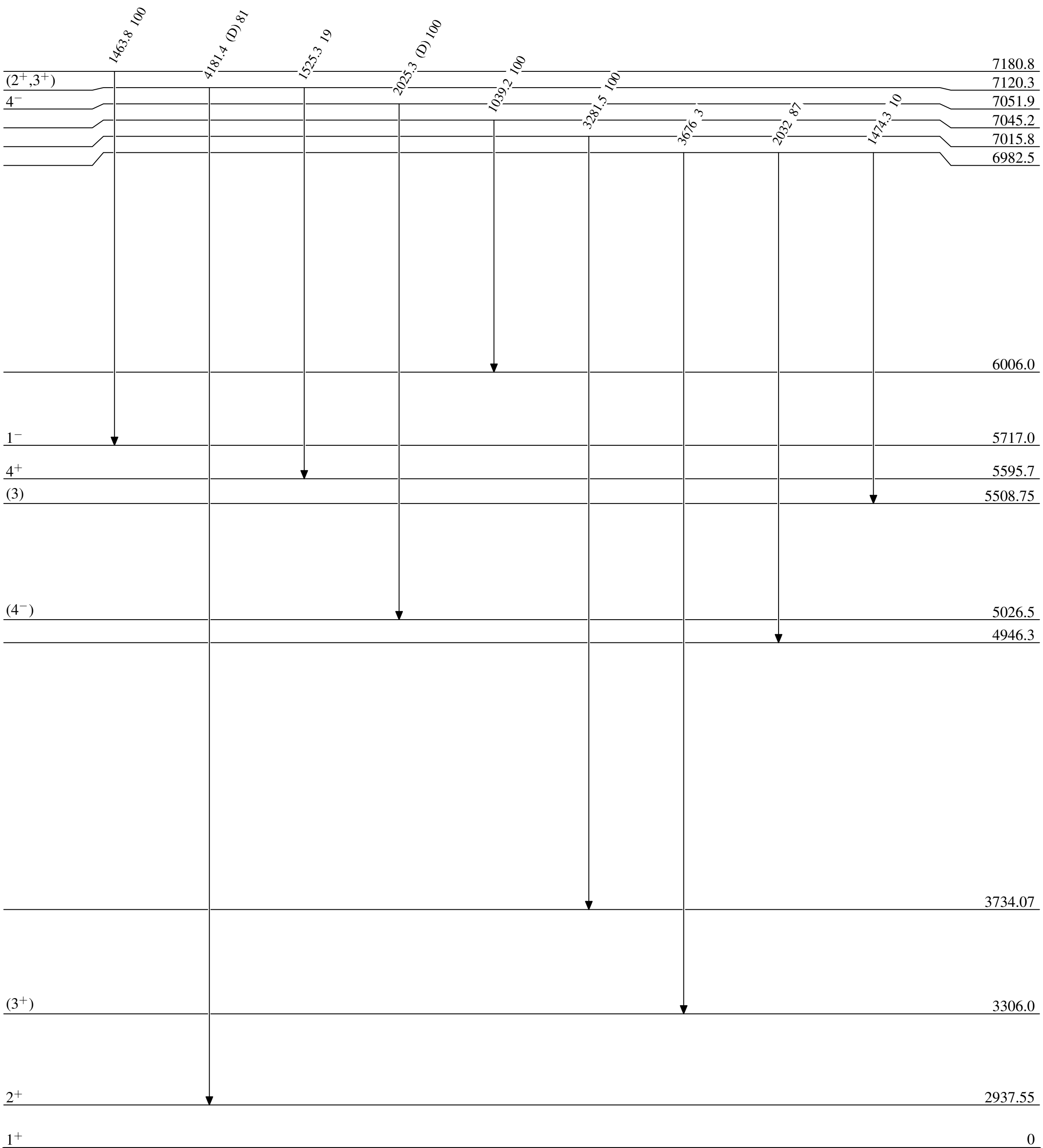


$^{30}_{15}P_{15}$

$^{28}Si(^{3}He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level

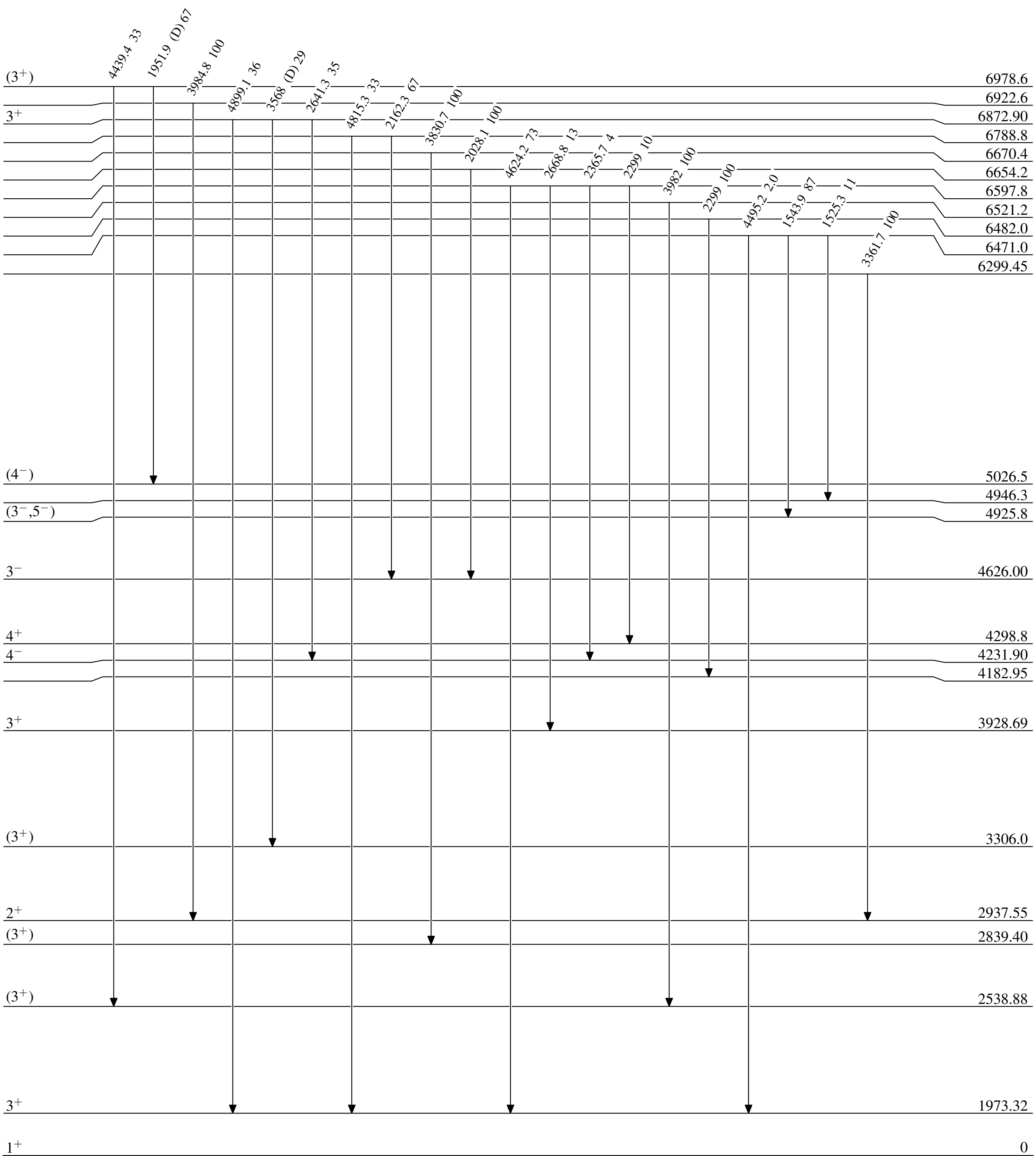


$^{30}_{15}P_{15}$

$^{28}Si(^{3}He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level

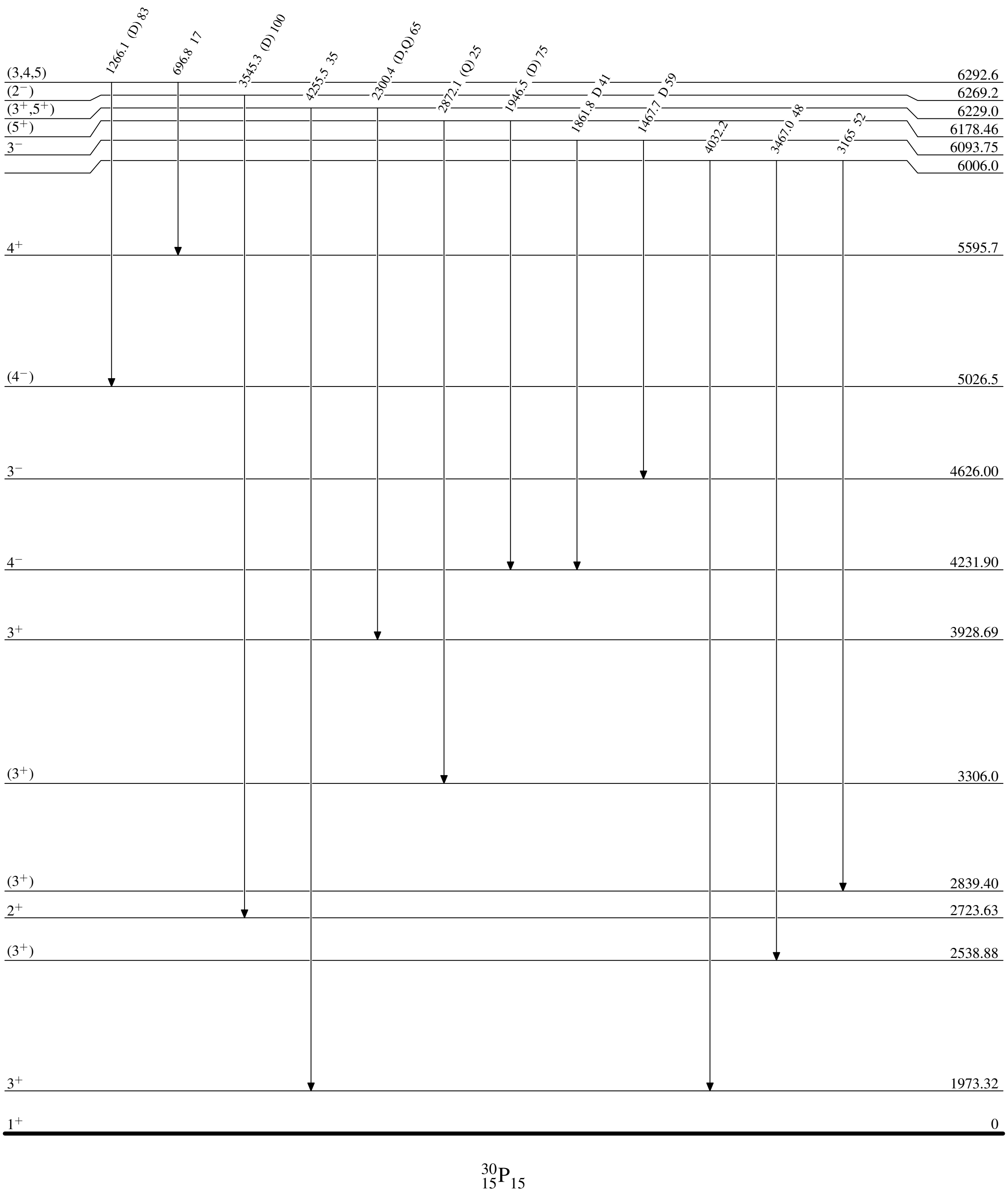


$^{30}_{15}P_{15}$

$^{28}Si(^{3}He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

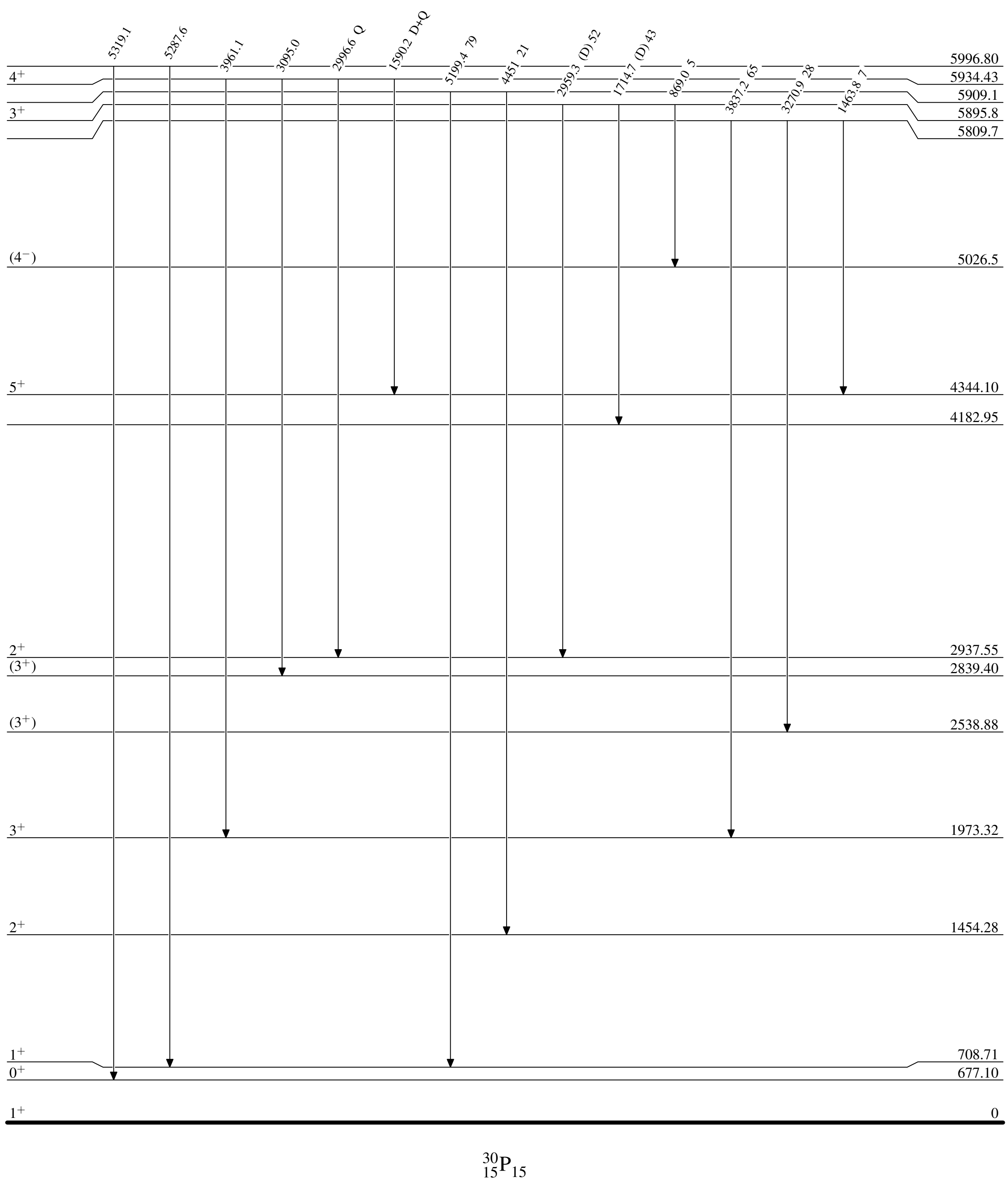
Intensities: % photon branching from each level



$^{28}Si(^3He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

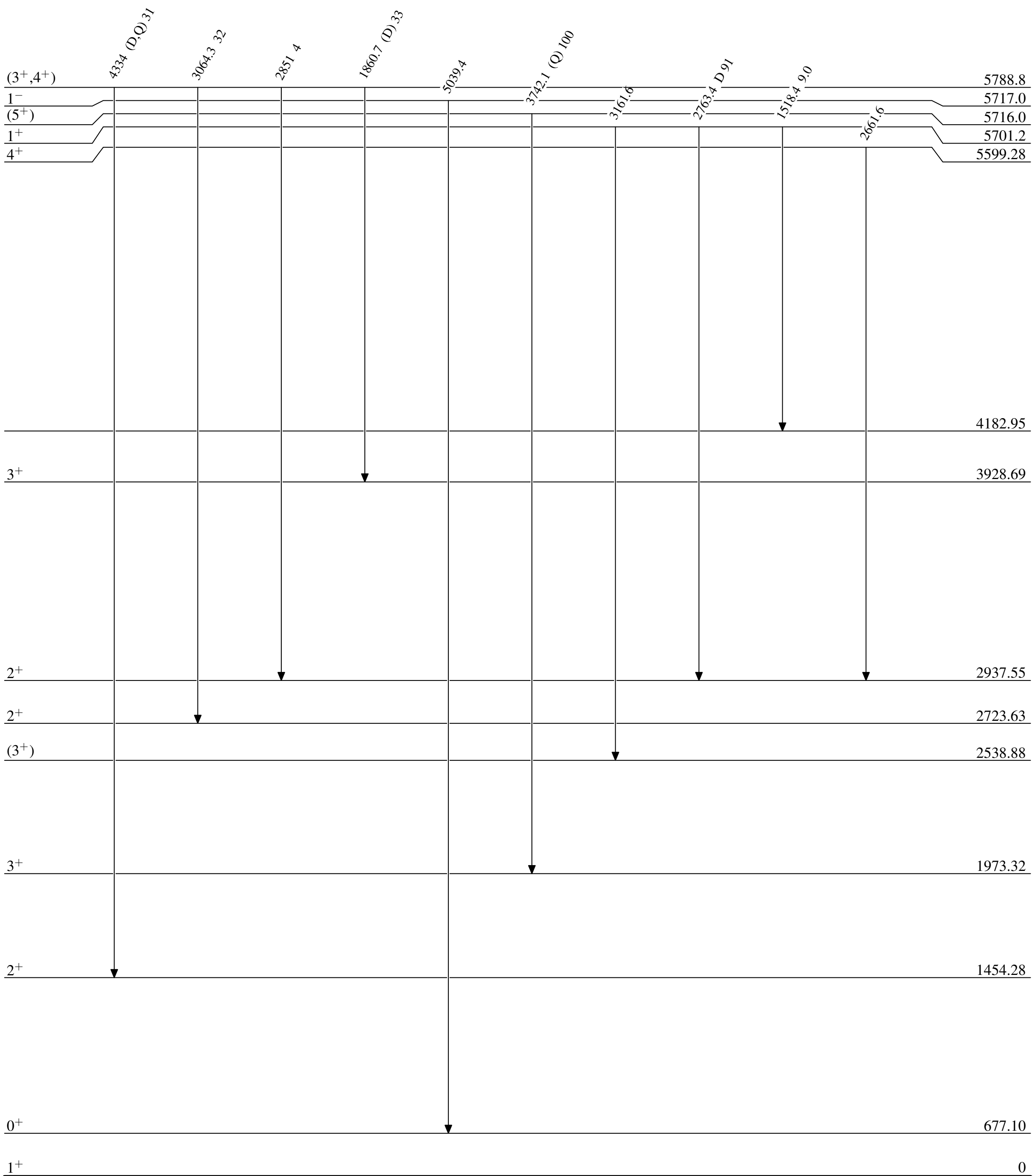
Intensities: % photon branching from each level



^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level

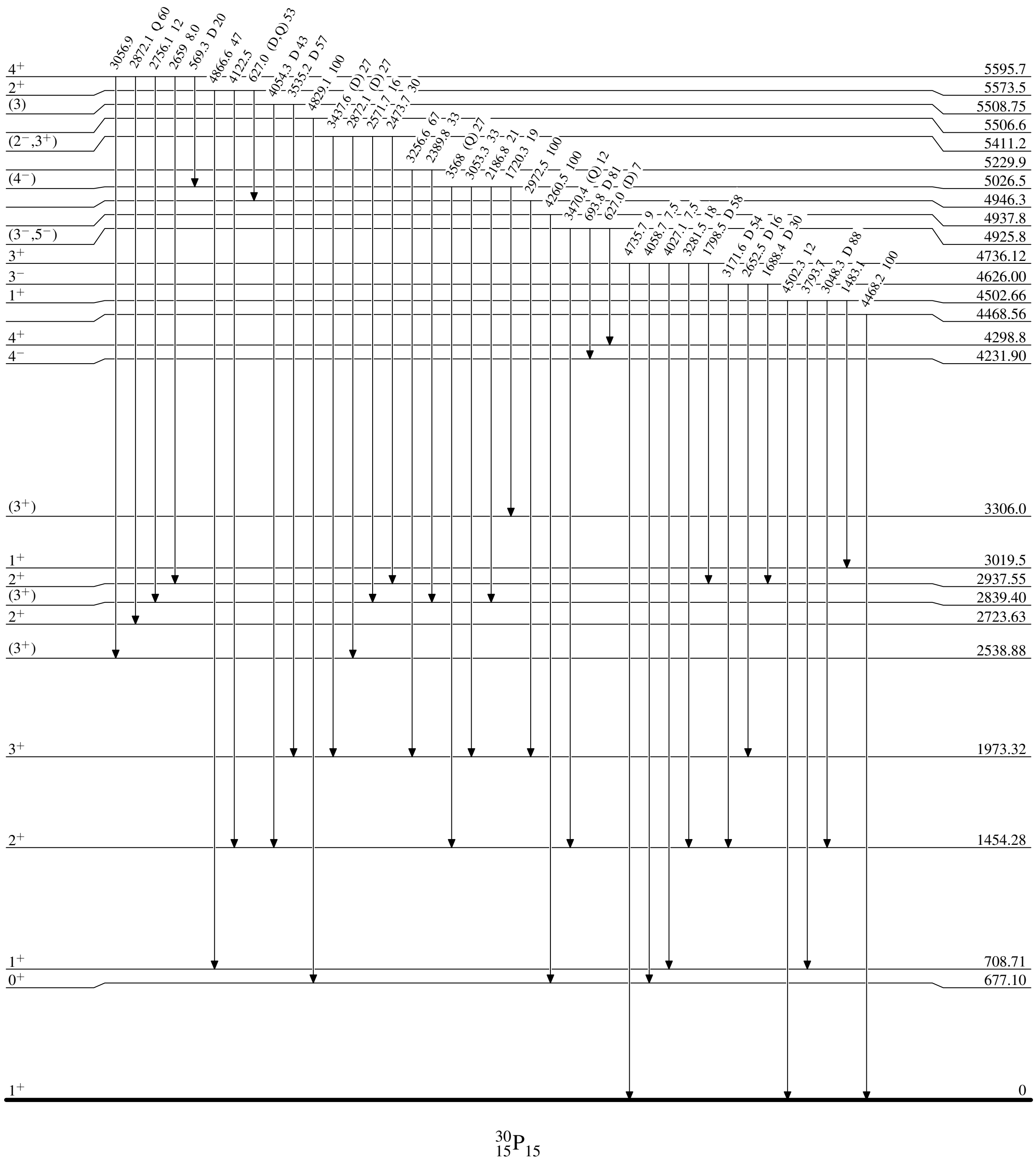


$^{30}_{15}P_{15}$

$^{28}Si(^{3}He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

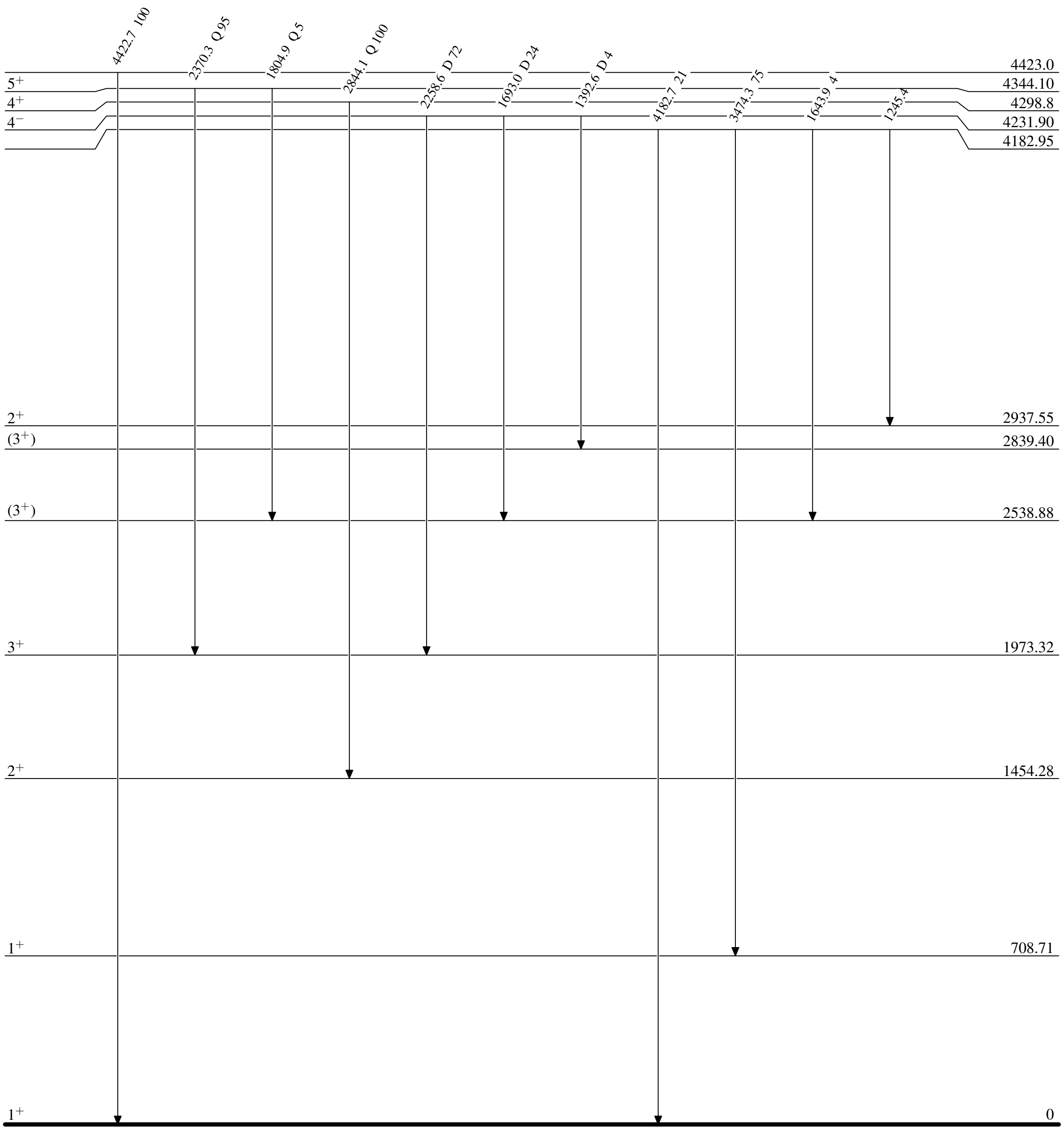
Intensities: % photon branching from each level



$^{28}Si(^3He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level

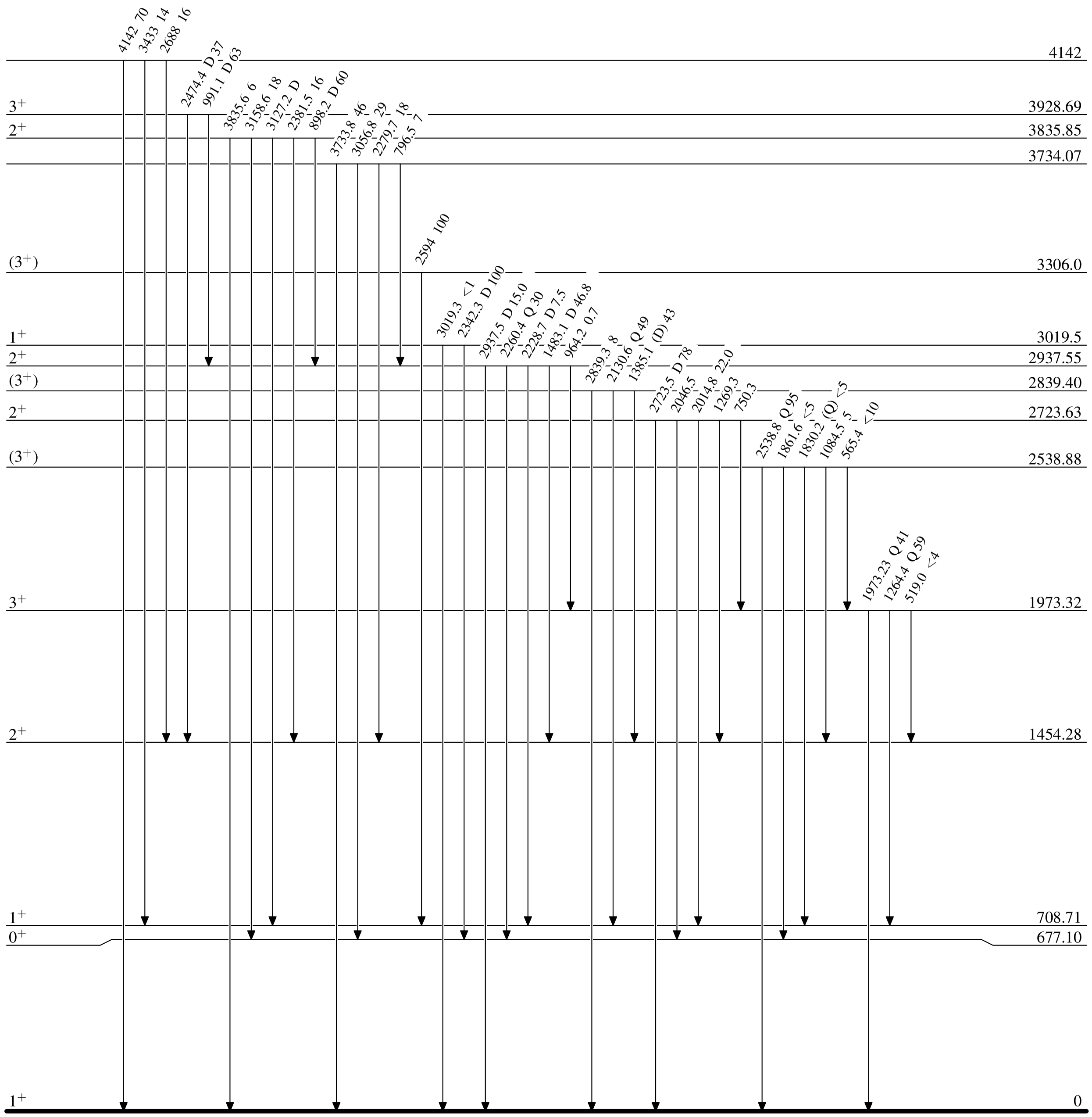


$^{30}_{15}P_{15}$

$^{28}Si(^{3}He,p\gamma)$ 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level

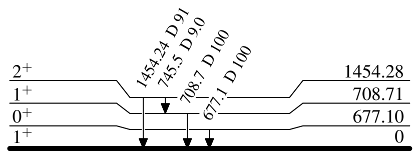


$^{30}_{15}P_{15}$

^{28}Si(^{3}He,pγ) 2014Mc08,2014McZZ,1968Ve04

Level Scheme (continued)

Intensities: % photon branching from each level



$^{30}_{15}P_{15}$