

$^{28}\text{Si}(^{28}\text{Si},2\alpha p\gamma)$ E=125 MeV 1998Ca26

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows	NDS 108, 923 (2007)	20-Feb-2007

Measured E_γ , I_γ , $\gamma\gamma$, $\gamma(\theta)$, $\gamma\gamma(\theta)$ (DCO), and lifetimes using 8π γ spectrometer with 20 detectors.

^{47}V Levels

E(level) [†]	J^π ^{‡@}	$T_{1/2}$ [#]	E(level) [†]	J^π ^{‡@}	$T_{1/2}$ [#]
0 ^a	3/2 ⁻ &		4133.4 ^a 15	19/2 ⁻	0.49 ps 7
87.6 ^b 6	5/2 ⁻ &		5000.4 ^d 17	17/2 ⁺	
145.7 ^a 7	7/2 ⁻ &		5500.4 ^b 17	(21/2 ⁻)	0.05 ps 3
259.6 ^c 5	3/2 ⁺ &		5729.7 ^c 13	(19/2 ⁺)	0.23 ps 4
660.6 ^d 9	5/2 ⁺ &		5903.4 ^a 17	(23/2 ⁻)	0.35 ps 5
1138.6 ^c 8	7/2 ⁺ &		6869.7 ^d 16	21/2 ⁺	
1271.8 ^b 8	9/2 ⁻ &		7400.4 ^b 18	(25/2 ⁻)	0.24 ps 3
1294.4 ^a 9	11/2 ⁻ &		7725.7 ^c 16	(23/2 ⁺)	<0.07 ps
1747.6 ^d 9	9/2 ⁺ &		7884.4 ^a 19	(27/2 ⁻)	0.097 ps 21
2415.7 ^c 9	11/2 ⁺ ^e	1.0 ps 4	9608.8 ^c 19	(27/2 ⁺)	0.08 ps 4
2558.2 ^b 10	13/2 ⁻ ^f		10005.5 ^a 24	(31/2 ⁻)	0.24 ps 3
2614.3 ^a 12	15/2 ⁻ ^g	>1.7 ps	10769.5 ^b 24	(29/2 ⁻)	<0.10 ps
3271.6 ^d 9	13/2 ⁺	>2 ps	11945 ^c 3	(31/2 ⁺)	<0.12 ps
3954.6 ^c 11	15/2 ⁺ ^h	0.37 ps 6	14038 ^a 4	(35/2 ⁻)	<0.08 ps

[†] From least-squares fit to E_γ 's (evaluator).

[‡] Assignments based on previous work, DCO's, and lifetime measurements. Detailed arguments added by evaluator.

[#] From Doppler shift attenuation method.

[@] Assignments from 1998Ca26 based on previous work, angular distributions, DCO, and life-time measurements. Parentheses added by evaluator.

& From the Adopted Levels.

^a Band(A): g.s. band, $\alpha=-1/2$. See band footnotes In the Adopted Levels for a comparison of band assignments In this and the other three (HI,xny) datasets.

^b Band(B): g.s. band, $\alpha=+1/2$. See band footnotes In the Adopted Levels for a comparison of band assignments In this and the other three (HI,xny) datasets.

^c Band(C): 3/2⁺ band, $\alpha=-1/2$. See band footnotes In the Adopted Levels for a comparison of band assignments In this and the other three (HI,xny) datasets.

^d Band(D): 3/2⁺ band, $\alpha=+1/2$. See band footnotes In the Adopted Levels for a comparison of band assignments In this and the other three (HI,xny) datasets.

^e J→J-2 E2 γ to 7/2⁺.

^f M1 γ from 15/2⁻ and γ to 9/2⁻.

^g J→J-2 E2 γ to 11/2⁻.

^h J→J-2 E2 γ to 11/2⁺.

ⁱ 1362 γ -1904 γ placed As 25/2⁻,7397→21/2⁻,6035→19/2⁻,4131 by 1998Be69 In $^{24}\text{Mg}(^{28}\text{Si},\alpha p\gamma)$ and 2001Br32 In $^{28}\text{Si}(^{28}\text{Si},2\alpha p\gamma)$ E=115 MeV.

$^{28}\text{Si}(^{28}\text{Si},2\alpha p\gamma) E=125 \text{ MeV}$ **1998Ca26 (continued)**

$\gamma(^{47}\text{V})$

Angular distributions (AD) and directional correlations of oriented nuclei (DCO) measured At 37° and 79°. An AD of ≈0.8 suggests J→J-1 dipole and of ≈1.5 suggests J→J dipole or J→J-2 quadrupole transition. The DCO ratio has values for stretched dipole and quadrupole γ_2 transitions of ≈1 and ≈1.5 for dipole γ_1 and ≈0.5 and ≈1 for quadrupole γ_1 ; same ambiguity for J→J dipole and J→J-2 quadrupole transitions As In AD.

E_γ †	I_γ ‡	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. #	Comments
56 I	1.9	2614.3	15/2 ⁻	2558.2	13/2 ⁻	M1	
58 I		145.7	7/2 ⁻	87.6	5/2 ⁻		
88 I		87.6	5/2 ⁻	0	3/2 ⁻		
146 I		145.7	7/2 ⁻	0	3/2 ⁻		
172.2 @ 6		259.6	3/2 ⁺	87.6	5/2 ⁻		
259.4 @ 5		259.6	3/2 ⁺	0	3/2 ⁻		
401 I		660.6	5/2 ⁺	259.6	3/2 ⁺		
403 ^d I	<3	5903.4	(23/2 ⁻)	5500.4?	(21/2 ⁻)		
478 I		1138.6	7/2 ⁺	660.6	5/2 ⁺		
484 I	8.2	7884.4	(27/2 ⁻)	7400.4	(25/2 ⁻)	M1	DCO=0.58 5 Mult.: J→J-1 D from AD and DCO. M1 from comparison to RUL.
609 I		1747.6	9/2 ⁺	1138.6	7/2 ⁺		
668 I	2.0	2415.7	11/2 ⁺	1747.6	9/2 ⁺	D,E2	
683 I	1.0	3954.6	15/2 ⁺	3271.6	13/2 ⁺	D,E2	
729 I	<0.6	5729.7	(19/2 ⁺)	5000.4	17/2 ⁺		
764 I	2.0	10769.5	(29/2 ⁻)	10005.5	(31/2 ⁻)		
856 I	1.5	3271.6	13/2 ⁺	2415.7	11/2 ⁺	D,E2	
879 I		1138.6	7/2 ⁺	259.6	3/2 ⁺		
966 @		6869.7	21/2 ⁺	5903.4	(23/2 ⁻)		
1087 I		1747.6	9/2 ⁺	660.6	5/2 ⁺		
1126 I		1271.8	9/2 ⁻	145.7	7/2 ⁻		
1144 I	0.5	2415.7	11/2 ⁺	1271.8	9/2 ⁻	D,E2	
1149 I		1294.4	11/2 ⁻	145.7	7/2 ⁻		
1184 I		1271.8	9/2 ⁻	87.6	5/2 ⁻		
1264 I		2558.2	13/2 ⁻	1294.4	11/2 ⁻		
1277 I	17	2415.7	11/2 ⁺	1138.6	7/2 ⁺	E2 ^b	
1286 I		2558.2	13/2 ⁻	1271.8	9/2 ⁻		
1320 I	100	2614.3	15/2 ⁻	1294.4	11/2 ⁻	E2 ^c	DCO=1.13 5
1343 @ ^d		2614.3	15/2 ⁻	1271.8	9/2 ⁻		
1367 & ^d I	2.0	5500.4?	(21/2 ⁻)	4133.4	19/2 ⁻	D,E2	
1497 I	18	7400.4	(25/2 ⁻)	5903.4	(23/2 ⁻)	D ^a	
1519 I	80	4133.4	19/2 ⁻	2614.3	15/2 ⁻	D,E2	
1524 I	8.1	3271.6	13/2 ⁺	1747.6	9/2 ⁺	D,E2	
1539 I	11	3954.6	15/2 ⁺	2415.7	11/2 ⁺	E2 ^b	
1601 @		1747.6	9/2 ⁺	145.7	7/2 ⁻		
1729 I	4.5	5000.4	17/2 ⁺	3271.6	13/2 ⁺		
1770 I	59	5903.4	(23/2 ⁻)	4133.4	19/2 ⁻	(E2)	DCO=1.16 4 Mult.: J→J or J→J-2 from AD and DCO. ≠ M2 from comparison to RUL. ≠ J→J from existence of cascade transition?
1775 I	5.9	5729.7	(19/2 ⁺)	3954.6	15/2 ⁺	(E2)	Mult.: J→J or J→J-2 from AD. ≠ M2 from comparison to RUL. ≠ J→J from existence of cascade transition?
1869 I	1.2	6869.7	21/2 ⁺	5000.4	17/2 ⁺	Q	Mult.: J→J or J→J-2 from AD. ≠ J→J from existence of cascade transition.
1883 I	2.2	9608.8	(27/2 ⁺)	7725.7	(23/2 ⁺)	E2	DCO=1.9 2

Continued on next page (footnotes at end of table)

${}^{28}\text{Si}({}^{28}\text{Si},2\alpha p\gamma)$ E=125 MeV **1998Ca26** (continued) $\gamma({}^{47}\text{V})$ (continued)

E_γ [†]	I_γ [‡]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [#]	Comments
							Mult.: J→J-2 Q from DCO (J→J-1 gate). ≠ M2 from comparison to RUL.
1900 ^{&} 1	2.1	7400.4	(25/2 ⁻)	5500.4?	(21/2 ⁻)	D,E2	
1977 1	0.5	3271.6	13/2 ⁺	1294.4	11/2 ⁻	D,E2	
1981 1	10	7884.4	(27/2 ⁻)	5903.4	(23/2 ⁻)	E2 ^c	DCO=1.0 1
1996 1	1.8	7725.7	(23/2 ⁺)	5729.7	(19/2 ⁺)	D,E2	
2121 2	10	10005.5	(31/2 ⁻)	7884.4	(27/2 ⁻)	E2	DCO=1.2 1
							Mult.: J→J-2 Q from DCO. ≠ M2 from comparison to RUL.
2336 2	1.7	11945	(31/2 ⁺)	9608.8	(27/2 ⁺)	D,E2	DCO=2.6 5
							Mult.: J→J or J→J-2 from AD. ≠ M2 from comparison to RUL.
2885 2	4.1	10769.5	(29/2 ⁻)	7884.4	(27/2 ⁻)	D ^a	
4032 2	3.9	14038	(35/2 ⁻)	10005.5	(31/2 ⁻)	E2	Mult.: J→J-2 Q from AD. ≠ M2 from comparison to RUL.

[†] Uncertainty 1 keV for $E_\gamma < 2$ MeV and 2 keV for $E_\gamma > 2$ MeV.

[‡] Relative intensities. See Table III of **1998Ca26** for branching ratios.

[#] From comparison to RUL, except As noted (evaluator). Detailed arguments by evaluator based on interpretation of AD's and DCO's given Table III of **1998Ca26** and comparison to RUL.

[@] From the Adopted Gammas.

[&] Assigned order based on relative $F(\tau)$ values. 1362 γ -1904 γ placed As 25/2⁻,7397→21/2⁻,6035→19/2⁻,4131 by **1998Be69** In ${}^{24}\text{Mg}({}^{28}\text{Si},\alpha p\gamma)$ and **2001Br32** ${}^{28}\text{Si}({}^{28}\text{Si},2\alpha p\gamma)$ E=115 MeV.

^a J→J-1 D from AD.

^b J→J or J→J-2 from AD. ≠ J→J from existence of cascade transition; ≠ M2 from comparison to RUL.

^c J→J or J→J-2 from AD and DCO. ≠ J→J from existence of cascade transition; ≠ M2 from comparison to RUL.

^d Placement of transition in the level scheme is uncertain.

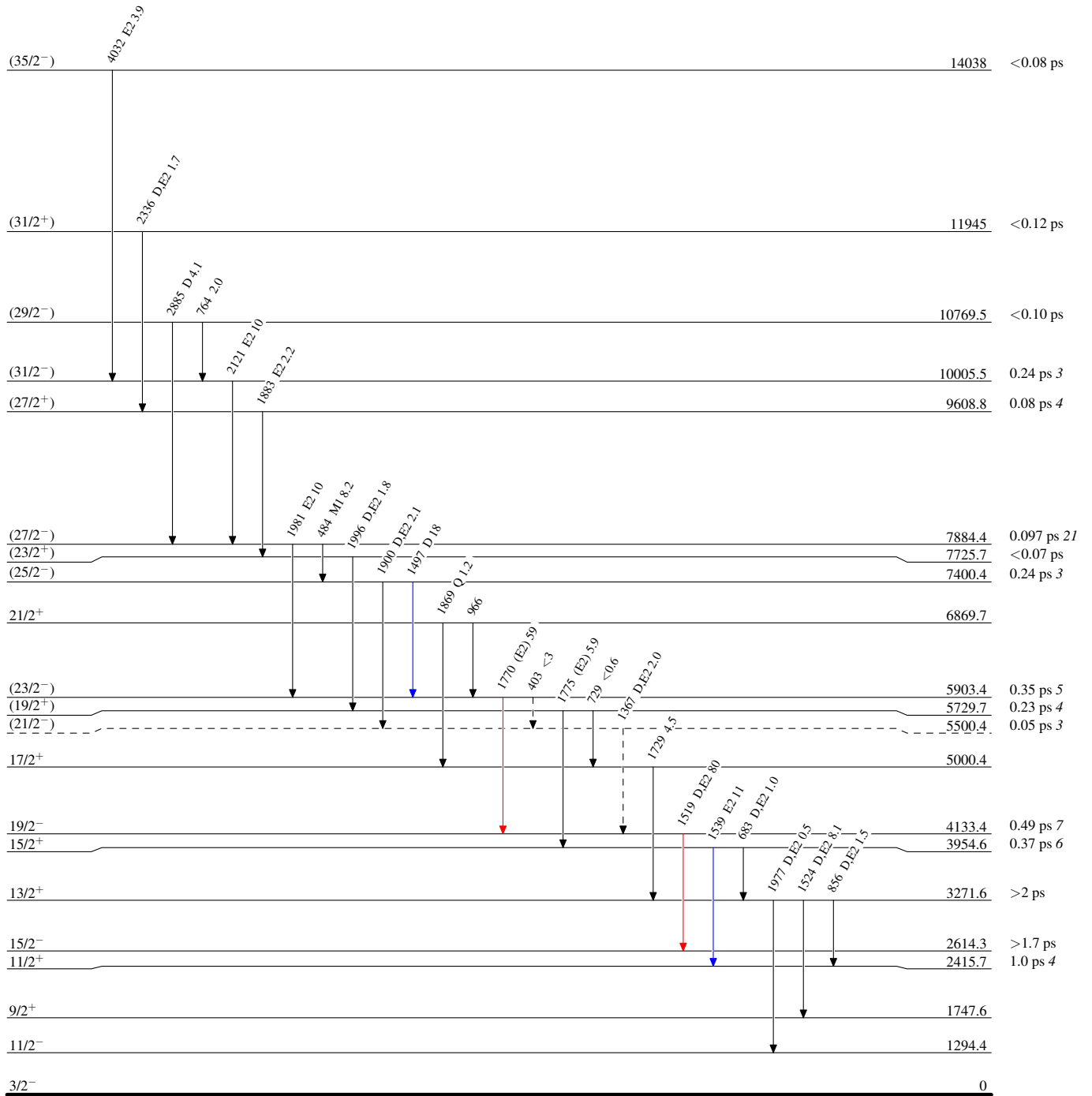
${}^{28}\text{Si}({}^{28}\text{Si}, 2\alpha p\gamma) E=125 \text{ MeV}$ 1998Ca26

Legend

Level Scheme

Intensities: Relative I_γ

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - -→ γ Decay (Uncertain)



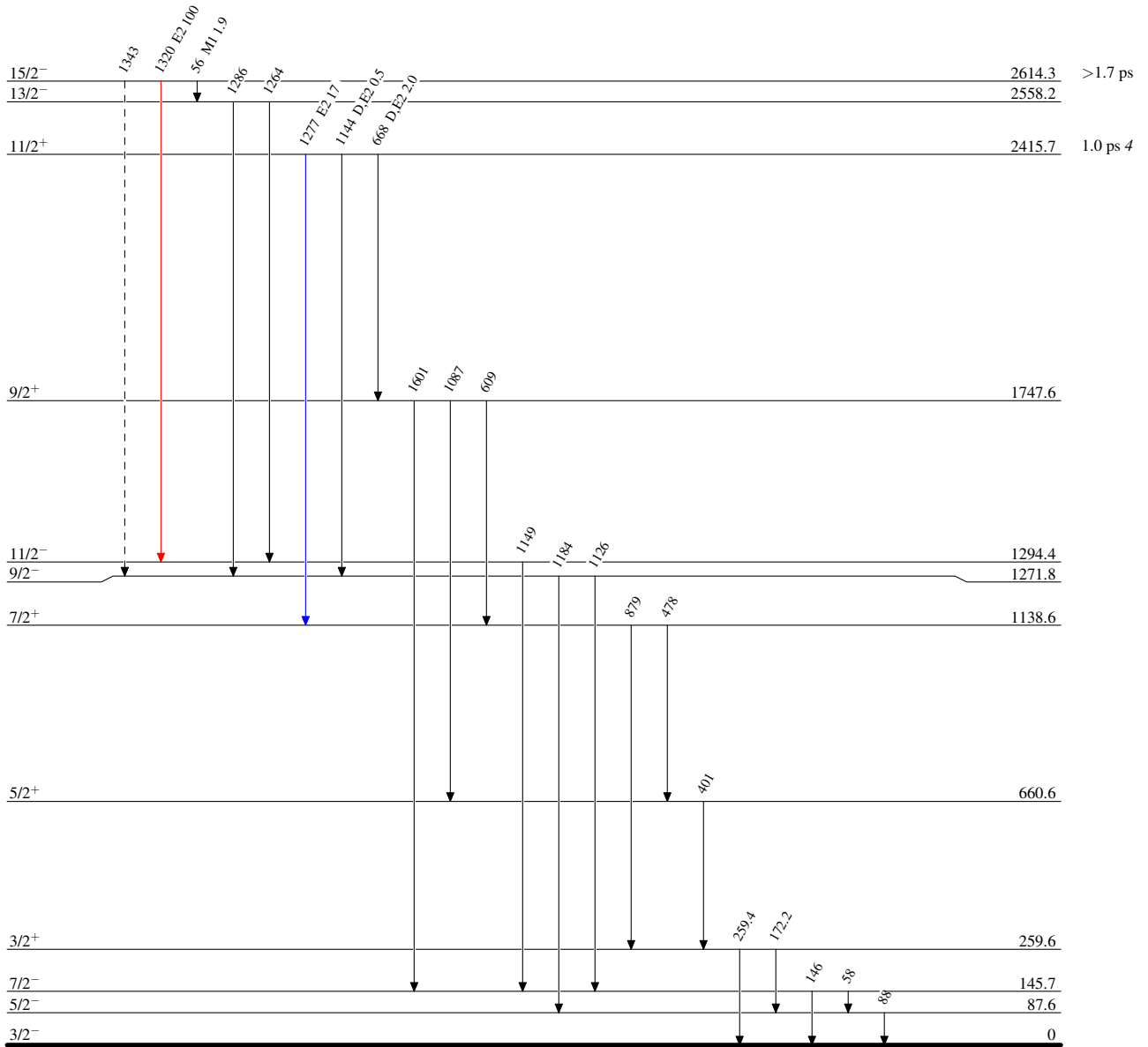
${}^{28}\text{Si}({}^{28}\text{Si}, 2\alpha p\gamma) E=125 \text{ MeV}$ 1998Ca26

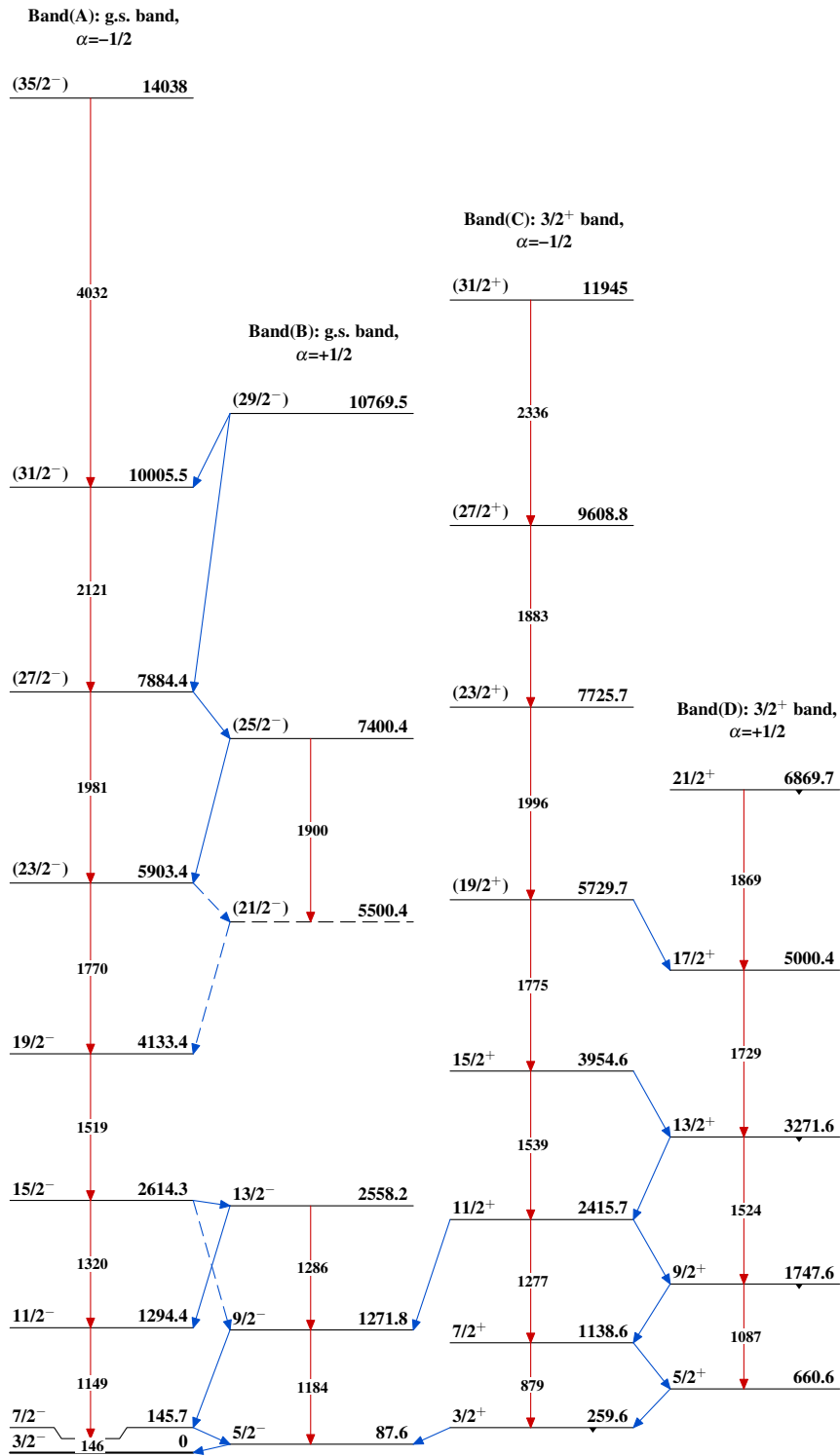
Legend

Level Scheme (continued)

Intensities: Relative I_γ

- \longrightarrow $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- \longrightarrow $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- \longrightarrow $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- \dashrightarrow γ Decay (Uncertain)

 ${}^{47}_{23}\text{V}_{24}$

${}^{28}\text{Si}({}^{28}\text{Si}, 2\alpha p \gamma) E=125 \text{ MeV}$ 1998Ca26 ${}^{47}_{23}\text{V}_{24}$