

$^{28}\text{Si}(^{24}\text{Mg},\alpha\text{pn}\gamma)$ 1999Le30,1999OI01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 91, 1 (2000)	15-Jul-2000

Additional information 1.

$E(^{24}\text{Mg})=100$ MeV (1999Le30); Si target enriched to 99.9% of 0.4 mg/cm². GASP γ -ray array: 40 Compton suppressed HP Ge detectors with an inner ball of 80 BGO crystals for γ rays. 4 π ISIS array: 40 E- Δ E Si telescopes for charged particles. γ , $\gamma\gamma$, $\gamma(\theta)$, DCO. Level energies, J^π , determined. See also, 1998Le43.

$^{24}\text{Mg}(^{28}\text{Si},\alpha\text{pn}\gamma)$: $E(^{24}\text{Mg})=87$ MeV (1999OI01); Mg target of 500 $\mu\text{g}/\text{cm}^2$. PEX apparatus: 4 Euroball cluster detectors at 104.6° and 145.8°. A dodecahedral silicon-wafer array of 31 detectors for charged particles. A neutron wall of 15 liquid scintillators. γ , $\gamma\gamma$, $\gamma(\theta)$. Level energies, J^π determined.

 ^{46}V Levels

E(level) [†]	J^π [‡]	Comments
0.0 ^{&}	0 ⁺	T: 1 isobaric state analog to the ground state of ^{46}Ti .
801.9 ^b 8	3 ⁺	
914.9 ^{&} 7	2 ⁺	T: 1 isobaric state analog to the 889-keV state of ^{46}Ti .
994.2 [@] 8	1 ⁺	
1178.9 ^c 10	4 ⁺	
1223.8 ^b 9	5 ⁺	
1236.6 [@] 10	(0 ⁻)	
1253.9 ^d 10		
1366.0 [#] 7	2	
1375.6 ^a 9	3 ⁺	
1537.9 ^c 9	6 ⁺	
1602.7 ^b 10	7 ⁺	
1665.5 [@] 11	3	
1724.8 ^a 9	5 ⁺	
1794.9 ^d 14		
1955.3 [#] 9	4 ⁻	
2053.3 ^{&} 11	4 ⁺	T: 1 isobaric state analog to the 2010-keV state of ^{46}Ti .
2387.1 [@] 10	5 ⁻	
2427.9 ^d 14		
2922.5 [#] 9	6 ⁻	
3093.9 ^b 12	9 ⁺	
3314.3 ^c 11	8 ⁺	
3364.8 ^{&} 14	6 ⁺	T: 1 isobaric state analog to the 3300-keV state of ^{46}Ti .
3405.6 ^d 11	(6 ⁻)	
3521.1 [@] 15	7 ⁻	
3640.9 ^a 11	7 ⁺	
4182.7 [#] 11	8 ⁻	
4223.2 ^d 11	(7 ⁻)	
4474.8 ^d 11	(8 ⁻)	
4566.9 ^b 16	11 ⁺	
4842.9 ^{&} 14	(8 ⁺)	T: (1) from 1999Le30.
4917.1 ^c 13	10 ⁺	
4931.0 [@] 18	9 ⁻	
4944.9 ^d 12	(9 ⁻)	

Continued on next page (footnotes at end of table)

$^{28}\text{Si}(^{24}\text{Mg},\alpha\text{pn}\gamma)$ **1999Le30,1999O101 (continued)** ^{46}V Levels (continued)

E(level) [†]	J ^π [‡]	Comments
5281.9 [#] 13	10 ⁻	
6253.9 [@] 20	11 ⁻	
7106.0 ^b 19	13 ⁺	
7165.0 [#] 16	12 ⁻	
7728.1 ^{&} 16	(11 ⁺)	T: (1) from 1999Le30.
8198.0 [@] 23	13 ⁻	
8269.1 ^{&} 19	(12 ⁺)	T: (1) from 1999Le30.
8488.9 ^b 21	15 ⁺	
9811.1 [#] 19	14 ⁻	
10106.0 ^{&} 24	(14 ⁺)	T: (1) from 1999Le30.
10849.0 [@] 25	15 ⁻	
11758.1 24	(16 ⁺)	
11778.8 [#] 22	16 ⁻	
13629 [@] 3	17 ⁻	

[†] Deduced from a least-square fit to γ -energies assuming γ -ray energy uncertainties of 1 keV.

[‡] Deduced from γ -ray angular distribution and the DCO ratios (1997LE30).

[#] Band(A): band built on 1366 (2⁻) level.

[@] Band(B): band built on 994 (1⁻) level.

[&] Band(C): T=1 g.s. band.

^a Band(D): T=0 band built on 1376 (3⁺) level.

^b Band(E): T=0 band built on $K^\pi=3^+$ isomeric state.

^c Band(F): T=0 band built on 1179 (4⁺) level.

^d Band(G): band built on 1254 level, not observed In 1999O101.

 $\gamma(^{46}\text{V})$

$E_i(\text{level})$	J_i^π	E_γ [†]	E_f	J_f^π	Mult. [#]	$E_i(\text{level})$	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult. [#]
801.9	3 ⁺	802	0.0	0 ⁺		1724.8	5 ⁺	349		1375.6	3 ⁺	
914.9	2 ⁺	914.9	0.0	0 ⁺	E2			500		1223.8	5 ⁺	E2
994.2	1 ⁺	994	0.0	0 ⁺		1794.9		541 [@]		1253.9		
1178.9	4 ⁺	377	801.9	3 ⁺	E2	1955.3	4 ⁻	230 [@]		1724.8	5 ⁺	
1223.8	5 ⁺	422	801.9	3 ⁺				580 [@]		1375.6	3 ⁺	
1236.6	(0 ⁻)	242 [@]	994.2	1 ⁺				589		1366.0	2	
1253.9		339 [@]	914.9	2 ⁺				732 [@]		1223.8	5 ⁺	
		452 [@]	801.9	3 ⁺		2053.3	4 ⁺	678	100 20	1375.6	3 ⁺	M1
1366.0	2	129 [@]	1236.6	(0 ⁻)		2387.1	5 ⁻	334		2053.3	4 ⁺	
		372	994.2	1 ⁺				721.5		1665.5	3	
		451	914.9	2 ⁺				849 [@]		1537.9	6 ⁺	
		1366	0.0	0 ⁺		2427.9		1174 [@]		1253.9		
1375.6	3 ⁺	461	914.9	2 ⁺	M1	2922.5	6 ⁻	967.7		1955.3	4 ⁻	
1537.9	6 ⁺	314	1223.8	5 ⁺	E2			1198 [@]		1724.8	5 ⁺	
		359	1178.9	4 ⁺				1384 [@]		1537.9	6 ⁺	
1602.7	7 ⁺	379	1223.8	5 ⁺				1698 [@]		1223.8	5 ⁺	
1665.5	3	750.5	914.9	2 ⁺		3093.9	9 ⁺	1491		1602.7	7 ⁺	

Continued on next page (footnotes at end of table)

$^{28}\text{Si}(^{24}\text{Mg},\alpha\text{pn}\gamma)$ **1999Le30,1999OI01 (continued)** $\gamma(^{46}\text{V})$ (continued)

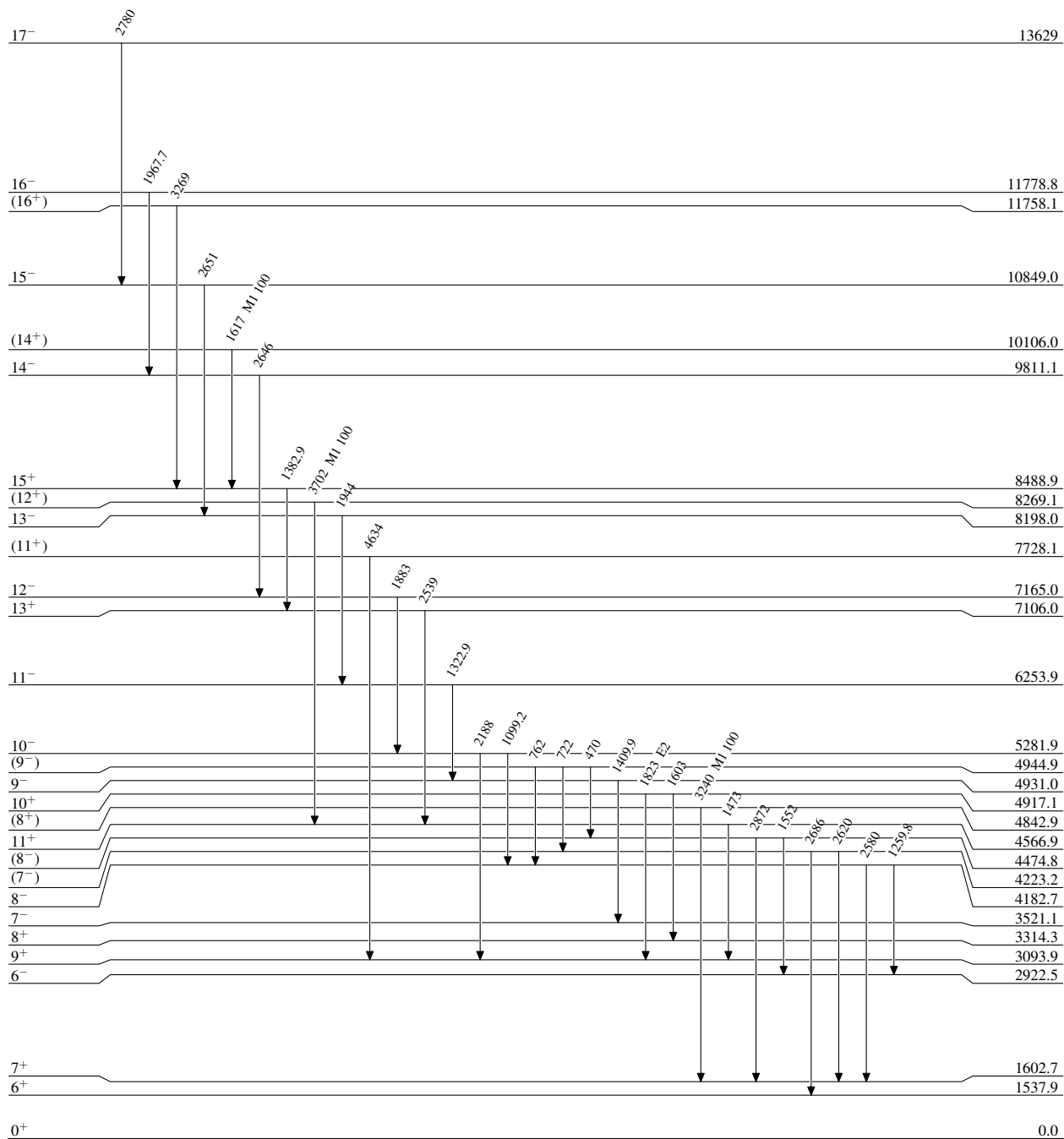
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]	Comments
3314.3	8 ⁺	1712		1602.7	7 ⁺		From 1999OI01, not given in 1999Le30.
		1776		1537.9	6 ⁺		
3364.8	6 ⁺	1640	100 40	1724.8	5 ⁺	M1	
3405.6	(6 ⁻)	1450 @		1955.3	4 ⁻		
		1868 @		1537.9	6 ⁺		
3521.1	7 ⁻	1134		2387.1	5 ⁻		
3640.9	7 ⁺	1915		1724.8	5 ⁺		
		2418 @		1223.8	5 ⁺	E2	
4182.7	8 ⁻	1259.8		2922.5	6 ⁻		
		2580 @		1602.7	7 ⁺		
4223.2	(7 ⁻)	2620 @		1602.7	7 ⁺		
		2686 @		1537.9	6 ⁺		
4474.8	(8 ⁻)	1552 @		2922.5	6 ⁻		
		2872 @		1602.7	7 ⁺		
4566.9	11 ⁺	1473		3093.9	9 ⁺		
4842.9	(8 ⁺)	3240 @	100 45	1602.7	7 ⁺	M1	
4917.1	10 ⁺	1603		3314.3	8 ⁺		
		1823		3093.9	9 ⁺	E2	
4931.0	9 ⁻	1409.9		3521.1	7 ⁻		
4944.9	(9 ⁻)	470 @		4474.8	(8 ⁻)		
		722 @		4223.2	(7 ⁻)		
		762 @		4182.7	8 ⁻		
5281.9	10 ⁻	1099.2		4182.7	8 ⁻		
		2188 @		3093.9	9 ⁺		
6253.9	11 ⁻	1322.9		4931.0	9 ⁻		
7106.0	13 ⁺	2539		4566.9	11 ⁺		
7165.0	12 ⁻	1883		5281.9	10 ⁻		
7728.1	(11 ⁺)	4634 @		3093.9	9 ⁺		
8198.0	13 ⁻	1944		6253.9	11 ⁻		
8269.1	(12 ⁺)	3702 @	100 30	4566.9	11 ⁺	M1	
8488.9	15 ⁺	1382.9		7106.0	13 ⁺		
9811.1	14 ⁻	2646 @		7165.0	12 ⁻		
10106.0	(14 ⁺)	1617 @	100 30	8488.9	15 ⁺	M1	
10849.0	15 ⁻	2651 @		8198.0	13 ⁻		
11758.1	(16 ⁺)	3269 @		8488.9	15 ⁺		
11778.8	16 ⁻	1967.7 @		9811.1	14 ⁻		
13629	17 ⁻	2780 @		10849.0	15 ⁻		

[†] From average of 1999Le30 and 1999OI01, except as noted.[‡] From 1999Le30.[#] From DCO analysis, 1999Le30.

@ From 1999Le30, not given in 1999OI01.

$^{28}\text{Si}(^{24}\text{Mg}, \alpha p n \gamma)$ 1999Le30,1999Ol01Level Scheme

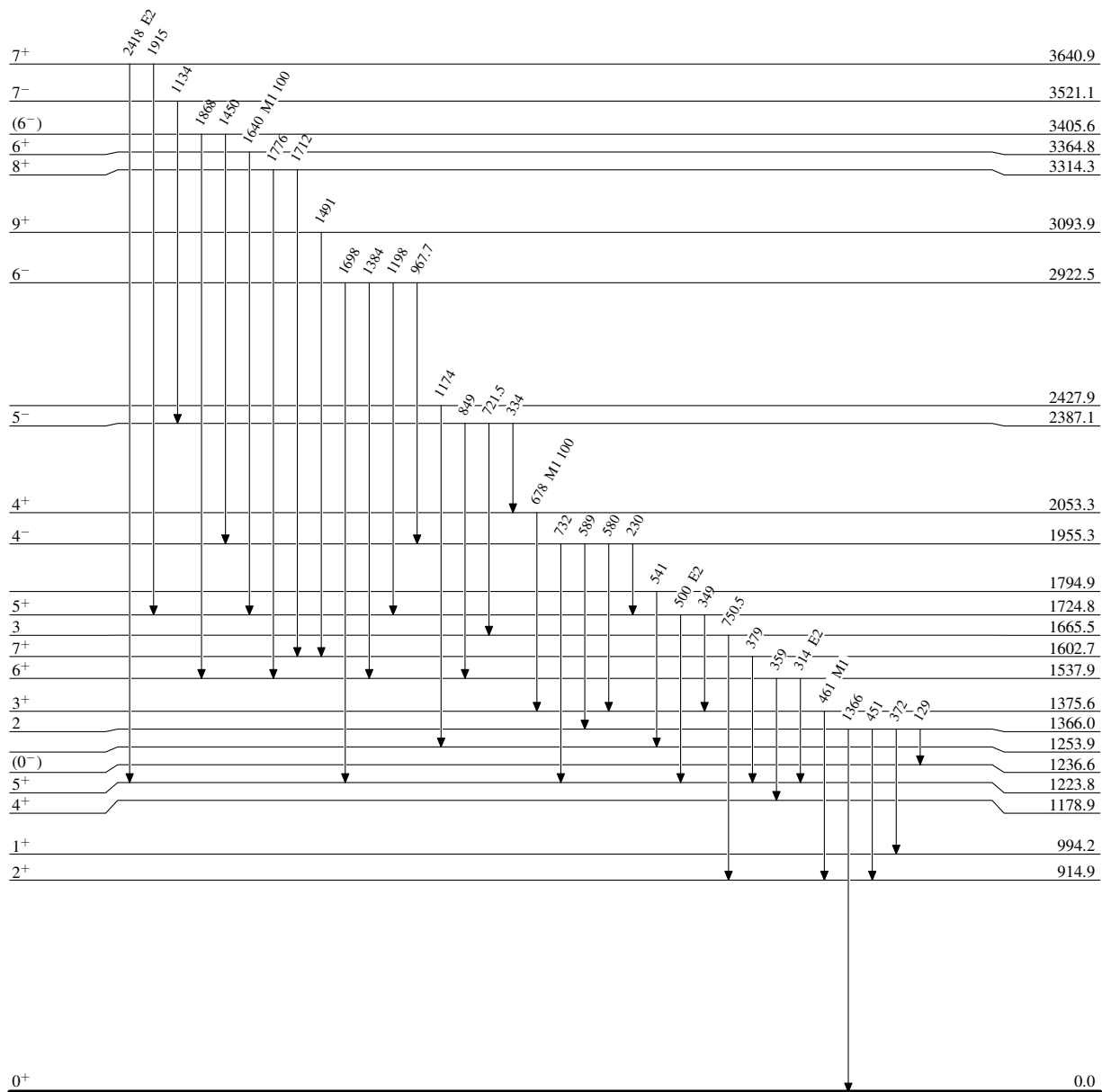
Intensities: Relative photon branching from each level



$^{28}\text{Si}(^{24}\text{Mg}, \alpha p n \gamma)$ 1999Le30,1999OI01

Level Scheme (continued)

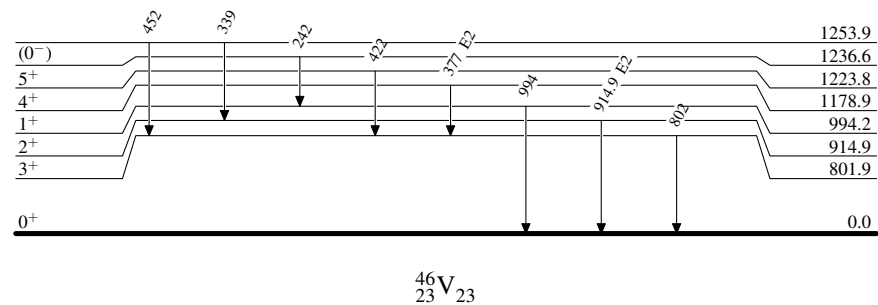
Intensities: Relative photon branching from each level

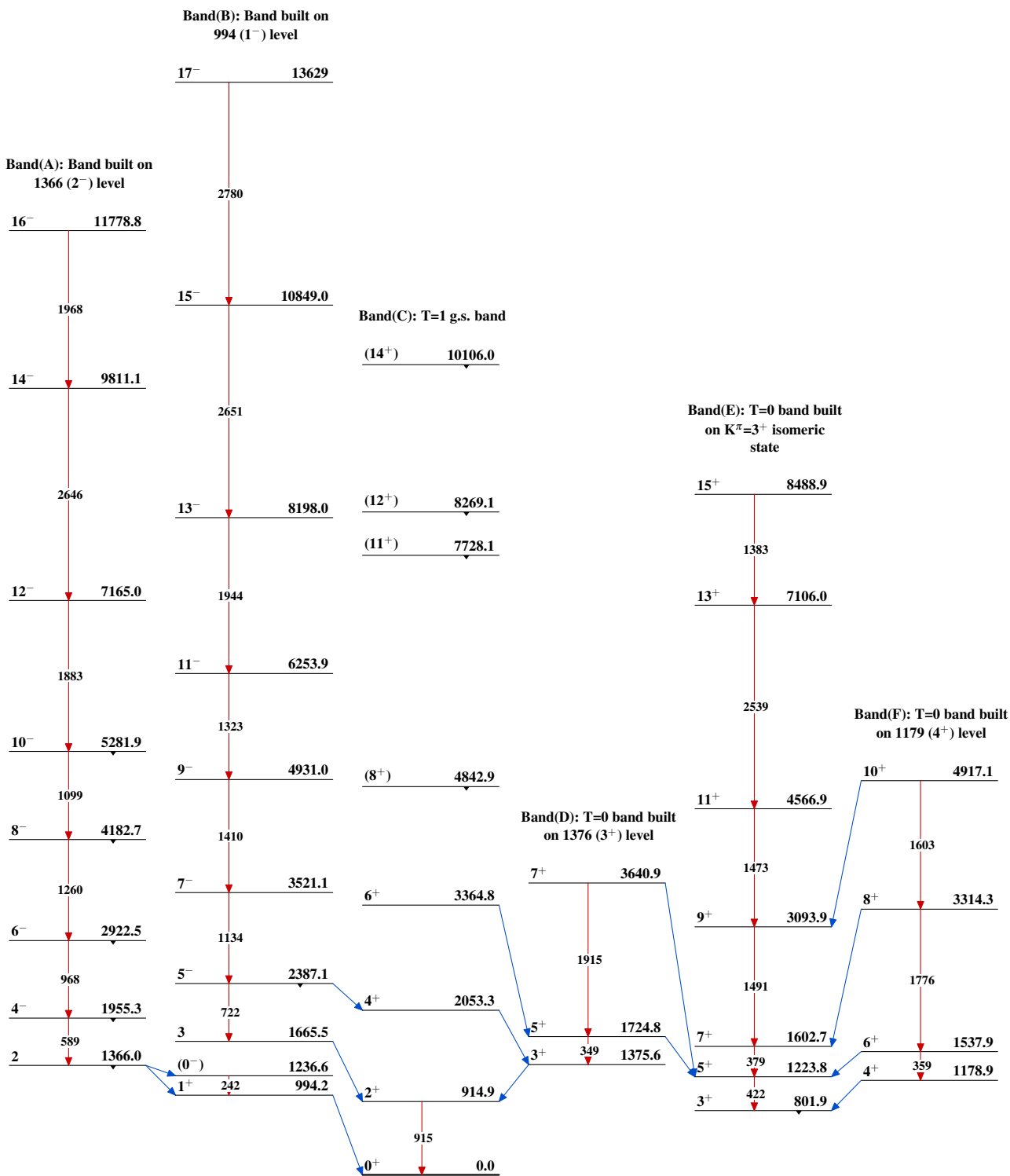
 $^{46}_{23}\text{V}_{23}$

$^{28}\text{Si}(^{24}\text{Mg},\alpha\text{pn}\gamma)$ 1999Le30,1999Ol01

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{28}\text{Si}(^{24}\text{Mg}, \alpha \text{pn} \gamma)$ 1999Le30,1999Ol01

$^{28}\text{Si}(^{24}\text{Mg},\alpha\text{pn}\gamma)$ 1999Le30,1999Ol01 (continued)

Band(G): Band built on 1254 level,
not observed in 1999Ol01

