

²⁸Si(⁵⁸Ni,np γ) 1991Gr16

Type	Author	Citation	History	Literature Cutoff Date
Full Evaluation	D. Abriola and M. Galan	NDS 110,2815 (2009)		30-Sep-2009

1991Gr16: E=195 MeV measured: γ , $\gamma\gamma$, X γ , DCO.

⁸⁴Nb Levels

Unknown Band Heads X and Y in 1991Gr16 were assigned by evaluators by comparing data with 1999Ma23: X=570.4 keV and Y=337.9 keV.

E(level)	J π	E(level)	J π	E(level)	J π	E(level)	J π
337.7 \ddagger	(5 ⁻)	1267.7 \ddagger	(8 ⁻)	2774.3 \dagger	(12 ⁺)	4151.3 \dagger	(15 ⁺)
565.7 \ddagger	(6 ⁻)	1707.3 \dagger	(10 ⁺)	2986.3 \dagger	(13 ⁺)	5471.3 \dagger	(17 ⁺)
570.3 \dagger	(7 ⁺)	1765.7 \ddagger	(9 ⁻)	3114.7 \ddagger	(12 ⁻)	6905.3 \dagger	(19 ⁺)
865.3 \dagger	(8 ⁺)	1991.3 \dagger	(11 ⁺)	3772.7 \ddagger	(13 ⁻)		
923.7 \ddagger	(7 ⁻)	2121.7 \ddagger	(10 ⁻)	4044.3 \dagger	(14 ⁺)		
1201.3 \dagger	(9 ⁺)	2753.7 \ddagger	(11 ⁻)	4087.7 \ddagger	(14 ⁻)		

\dagger Band(A): band-1. Possible configuration= $\pi g_{9/2} \otimes \nu(f, p$ or $g)$.

\ddagger Band(B): band-2. Possibly a π - band with possible configuration= $\nu g_{9/2} \otimes \pi(f, p)$.

$\gamma(^{84}\text{Nb})$

E γ	I γ	E _i (level)	J π_i	E _f	J π_f	Mult. \dagger	Comments
^x 114.5 3	7 2						
^x 140.0 6	5 3						
^x 143.3 6	14 3						
^x 192.3 ^b 6	9 3						
228.0 4	105 [#] 8	565.7	(6 ⁻)	337.7 (5 ⁻)		(M1,E2) \ddagger	
^x 232.1 7	18 4						
232.1 ^{&} 7	18 4	570.3	(7 ⁺)	337.7 (5 ⁻)			
^x 238.7 4	30 5						
^x 259.5 ^a 4	15 4						
284.1 4	39 3	1991.3	(11 ⁺)	1707.3 (10 ⁺)		(M1,E2) \ddagger	Mult.: R(DCO)=0.59 5.
294.8 4	126 [#] 10	865.3	(8 ⁺)	570.3 (7 ⁺)		(E2) \ddagger	Mult.: R(DCO)=1.01 14.
336.5 4	100	1201.3	(9 ⁺)	865.3 (8 ⁺)		(D,E2) \ddagger	Mult.: R(DCO)=0.74 4.
358.2 4	27 5	923.7	(7 ⁻)	565.7 (6 ⁻)		(M1,E2) \ddagger	Mult.: R(DCO)=1.00 8.
^x 465.0 5	22 4						
^x 472.2 6	10 5						
586.2 6	41 5	923.7	(7 ⁻)	337.7 (5 ⁻)		(E2)	
631.3 ^d 6	14 3	1201.3	(9 ⁺)	570.3 (7 ⁺)			
701.9 6	84 6	1267.7	(8 ⁻)	565.7 (6 ⁻)		(E2) \ddagger	Mult.: R(DCO)=1.44 11.
^x 783.5 ^c 10	19 7						
789.6 8	99 8	1991.3	(11 ⁺)	1201.3 (9 ⁺)		(E2) \ddagger	Mult.: R(DCO)=1.08 8.
841.7 8	52 [@] 10	1765.7	(9 ⁻)	923.7 (7 ⁻)		(E2)	
842.6 8	109 [@] 15	1707.3	(10 ⁺)	865.3 (8 ⁺)		(E2)	
854.3 8	95 10	2121.7	(10 ⁻)	1267.7 (8 ⁻)		(E2) \ddagger	Mult.: R(DCO)=1.43 11.
^x 896.7 10	27 6						

Continued on next page (footnotes at end of table)

$^{28}\text{Si}(^{58}\text{Ni},\text{np}\gamma)$ 1991Gr16 (continued) $\gamma(^{84}\text{Nb})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
972.3 10	59 15	4087.7	(14 ⁻)	3114.7	(12 ⁻)	(E2)	
988.5 ^e 15	60 [@] 20	2753.7	(11 ⁻)	1765.7	(9 ⁻)	(E2)	
993.5 15	81 [@] 25	3114.7	(12 ⁻)	2121.7	(10 ⁻)	(E2)	
995.4 8	125 [@] 20	2986.3	(13 ⁺)	1991.3	(11 ⁺)	(E2) [‡]	Mult.: R(DCO)=1.09 7.
1019 ^f 2	53 10	3772.7?	(13 ⁻)	2753.7	(11 ⁻)	(E2)	
1067.6 10	68 18	2774.3	(12 ⁺)	1707.3	(10 ⁺)	(E2)	
^x 1073.4 10	43 10						
1165.2 10	88 12	4151.3	(15 ⁺)	2986.3	(13 ⁺)	(E2) [‡]	Mult.: R(DCO)=1.02 10.
^x 1170.0 10	59 20						
1270 ^f 2	43 7	4044.3?	(14 ⁺)	2774.3	(12 ⁺)	(E2)	
1320.2 15	50 15	5471.3	(17 ⁺)	4151.3	(15 ⁺)	(E2)	
^x 1339 1	50 15						
^x 1386 2	27 10						
1434 2	45 15	6905.3	(19 ⁺)	5471.3	(17 ⁺)	(E2)	

[†] Authors' assignments are based on DCO ratio measurements and observation that the high-spin states populated in heavy-ion reactions decay via cascades of stretched E2 and E2/M1 transitions. They assign multipolarities for transition without DCO ratios as tentative.

[‡] Authors have determined these from measured DCO ratios.

[#] Intensity may be reduced due to long lifetimes.

[@] Doublet. Intensity estimated from coin gates.

[&] Unplaced γ ray in 1991Gr16 placed by the evaluators based on results from $^{58}\text{Ni}(^{28}\text{Si},\text{pn}\gamma)$ in 1999Ma23.

^a γ placed from 566 to 306 level In Adopted Levels, Gammas.

^b γ placed from 865 to 674 level In Adopted Levels, Gammas.

^c Probably the same As 781.3 γ from 1590 level In $^{58}\text{Ni}(^{28}\text{Si},\text{pn}\gamma)$.

^d This γ defines a separate level At 1206 keV In $^{58}\text{Ni}(^{28}\text{Si},\text{pn}\gamma)$.

^e A 988 γ is placed from a 5072 level In $^{58}\text{Ni}(^{28}\text{Si},\text{pn}\gamma)$ study.

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

^x γ ray not placed in level scheme.

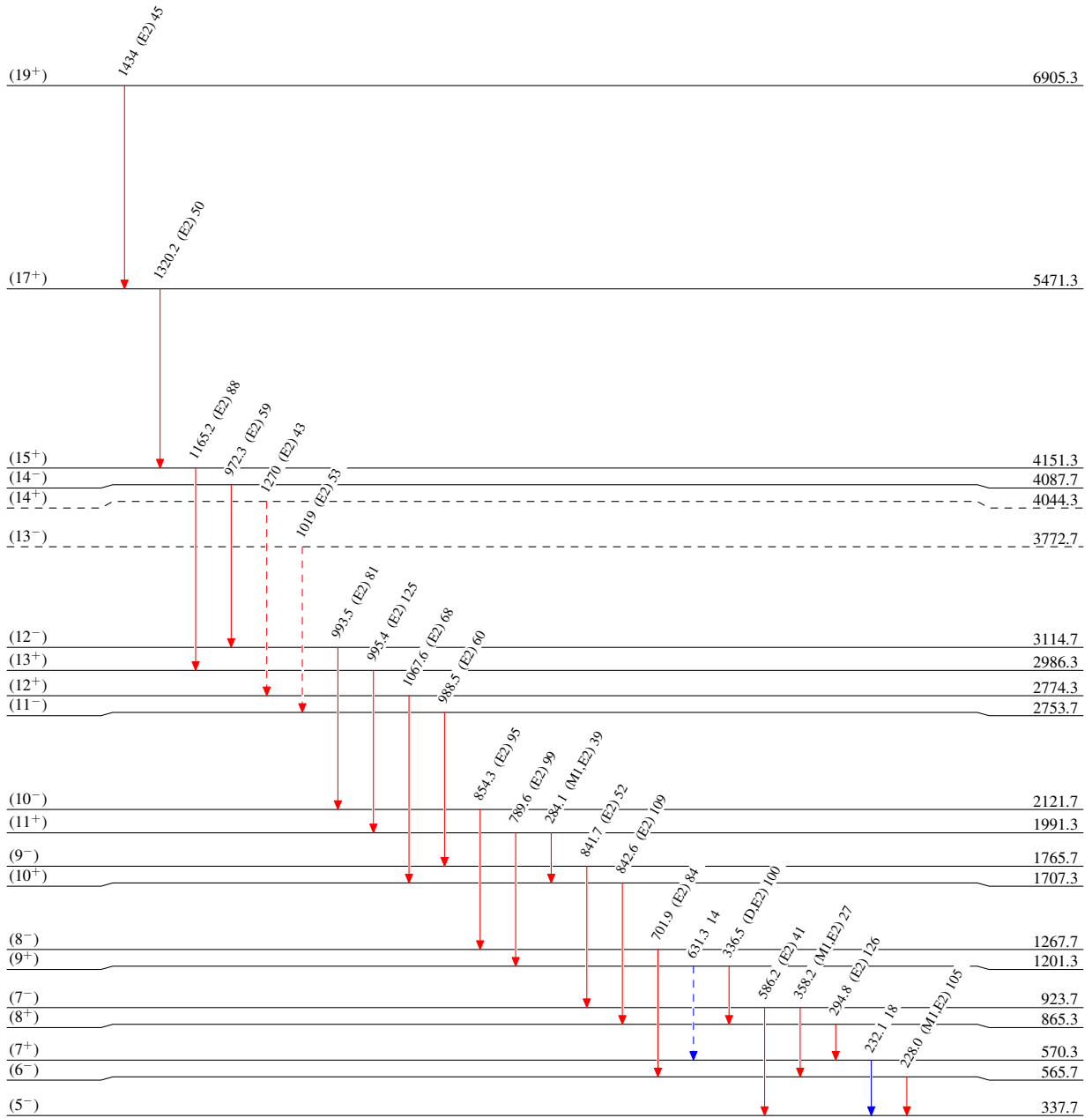
$^{28}\text{Si}(^{58}\text{Ni},\text{np}\gamma)$ 1991Gr16

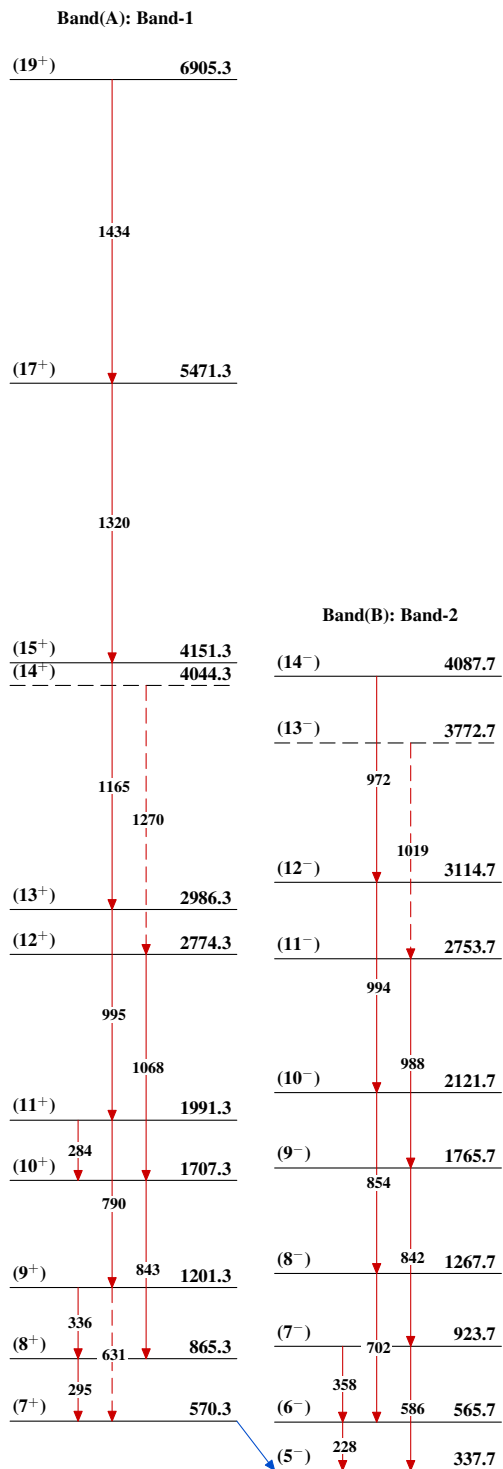
Legend

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)

 $^{84}_{41}\text{Nb}_{43}$

$^{28}\text{Si}(^{58}\text{Ni},n\gamma)$ 1991Gr16 $^{84}_{41}\text{Nb}_{43}$