

$^{28}\text{Si}(^{58}\text{Ni},\text{p}2\text{n}\gamma)$ 2007Fi07,1991Gr01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 125, 201 (2015)	31-Dec-2014

2007Fi07: E(^{58}Ni)=204,215 MeV. Measured E_γ , I_γ , $\gamma(\theta)$, $\gamma\gamma$ and recoil- γ coincidences using Gammasphere array consisting of 95 Compton-suppressed HPGe detectors. Reaction products separated according to their mass to charge ratio using the Fragment Mass Analyzer (FMA); two position-sensitive channel plate detectors and an ionization chamber at the focal plane of the FMA allowed for Z identification.

1991Gr01: E(^{58}Ni)=195 MeV. Measured E_γ , I_γ , $\gamma\gamma$ and recoil- γ coincidences using 20 Compton-suppressed Ge detectors. Reaction products separated according to their mass to charge ratio using the Daresbury Recoil Separator (RS); an ionization chamber at the focal plane of the RS allowed for Z identification.

The level scheme of **1991Gr01** is confirmed by **2007Fi07**, the latter of which is more extensive and adopted here.

^{83}Nb Levels

E(level) [†]	J ^π [‡]	E(level) [†]	J ^π [‡]	E(level) [†]	J ^π [‡]	E(level) [†]	J ^π [‡]
0 [#]	5/2 ⁺	641.5 ^a 3	7/2 ⁻	1441.4 [@] 6	(15/2 ⁺)	2689.1 ^{?&} 12	(17/2 ⁻)
129.52 [@] 16	7/2 ⁺	710.0 [@] 3	11/2 ⁺	1720.9 [#] 5	(17/2 ⁺)	2777.3 [#] 7	(21/2 ⁺)
229.03 ^a 19	3/2 ⁻	873.7 [#] 3	13/2 ⁺	1721.1 ^{&} 7	(13/2 ⁻)	4009.3 [#] 21	(25/2 ⁺)
251.15 [#] 16	9/2 ⁺	941.5 ^{&} 4	(9/2 ⁻)	2236.2 ^{?a} 11	(15/2 ⁻)	5241 [#] 3	(29/2 ⁺)
379.94 ^{&} 24	5/2 ⁻	1325.2 ^a 5	(11/2 ⁻)	2484.4 [@] 21	(19/2 ⁺)	6664 [#] 4	(33/2 ⁺)

[†] From a least-squares fit to E_γ , by evaluator.

[‡] As proposed by **2007Fi07** based on decay patterns, multipolarity assignments and comparison with projected shell model calculations.

[#] Band(A): $K^\pi=5/2^+$, $\alpha=+1/2$. Configuration= $\pi 5/2[422]$.

[@] Band(a): $K^\pi=5/2^+$, $\alpha=-1/2$. Configuration= $\pi 5/2[422]$.

[&] Band(B): $K^\pi=3/2^-$, $\alpha=+1/2$. Configuration= $\pi 3/2[301]$.

^a Band(b): $K^\pi=3/2^-$, $\alpha=-1/2$. Configuration= $\pi 3/2[301]$.

$\gamma(^{83}\text{Nb})$

E_γ [†]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	δ [‡]	Comments
121.6 2	71 3	251.15	9/2 ⁺	129.52	7/2 ⁺	D+Q	+0.15 6	
129.5 2	100 5	129.52	7/2 ⁺	0	5/2 ⁺	D+Q	+0.20 7	
150.9 2	45 3	379.94	5/2 ⁻	229.03	3/2 ⁻	D+Q	+0.14 9	
163.4 4	5 3	873.7	13/2 ⁺	710.0	11/2 ⁺			
229.0 2	114 6	229.03	3/2 ⁻	0	5/2 ⁺	D		I_γ : includes a contribution from a contaminant γ ray in ^{84}Nb .
250.6 [@] 5	<10	379.94	5/2 ⁻	129.52	7/2 ⁺			
251.2 2	28 4	251.15	9/2 ⁺	0	5/2 ⁺	Q		
261.5 3	27 5	641.5	7/2 ⁻	379.94	5/2 ⁻	D+Q	+0.19 17	
299.8 4	17 5	941.5	(9/2 ⁻)	641.5	7/2 ⁻			
384 1	<8	1325.2	(11/2 ⁻)	941.5	(9/2 ⁻)			
412.4 4	26 7	641.5	7/2 ⁻	229.03	3/2 ⁻			
458.8 3	26 7	710.0	11/2 ⁺	251.15	9/2 ⁺			
561.9 5	29 9	941.5	(9/2 ⁻)	379.94	5/2 ⁻			
580 1	30 16	710.0	11/2 ⁺	129.52	7/2 ⁺			
622.7 3	78 10	873.7	13/2 ⁺	251.15	9/2 ⁺	Q		
683.6 5	25 10	1325.2	(11/2 ⁻)	641.5	7/2 ⁻			
731.3 5	25 10	1441.4	(15/2 ⁺)	710.0	11/2 ⁺			

Continued on next page (footnotes at end of table)

${}^{28}\text{Si}({}^{58}\text{Ni},\text{p}2\text{n}\gamma)$ 2007Fi07,1991Gr01 (continued) $\gamma({}^{83}\text{Nb})$ (continued)

E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π
779.6 6	28 11	1721.1	(13/2 ⁻)	941.5	(9/2 ⁻)	1056.4 5	32 8	2777.3	(21/2 ⁺)	1720.9	(17/2 ⁺)
847.2 4	72 14	1720.9	(17/2 ⁺)	873.7	13/2 ⁺	1232 [#] 2	53 [#]	4009.3	(25/2 ⁺)	2777.3	(21/2 ⁺)
911 [@] 1	18 9	2236.2?	(15/2 ⁻)	1325.2	(11/2 ⁻)	1232 [#] 2	53 [#]	5241	(29/2 ⁺)	4009.3	(25/2 ⁺)
968 [@] 1	21 11	2689.1?	(17/2 ⁻)	1721.1	(13/2 ⁻)	1423 2	8	6664	(33/2 ⁺)	5241	(29/2 ⁺)
1043 2	16 9	2484.4	(19/2 ⁺)	1441.4	(15/2 ⁺)						

[†] From 20007Fi07. The data at $E({}^{58}\text{Ni})=204$ MeV and 215 MeV were combined.

[‡] From $\gamma(\theta)$ measurements in 2007Fi07. No details on A_2 or A_4 coefficients were given by the authors.

[#] Multiply placed with undivided intensity.

[@] Placement of transition in the level scheme is uncertain.

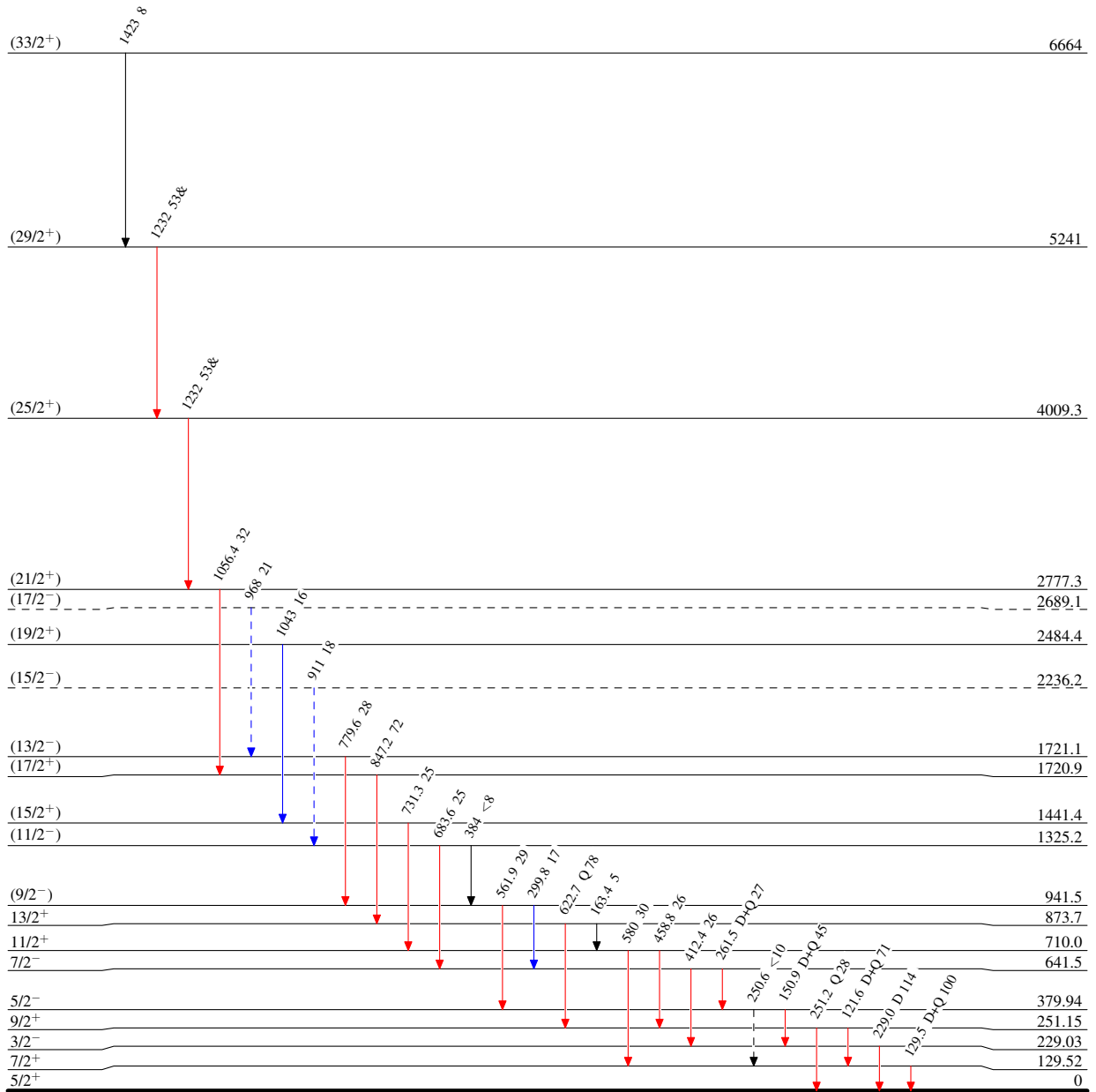
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Level Scheme

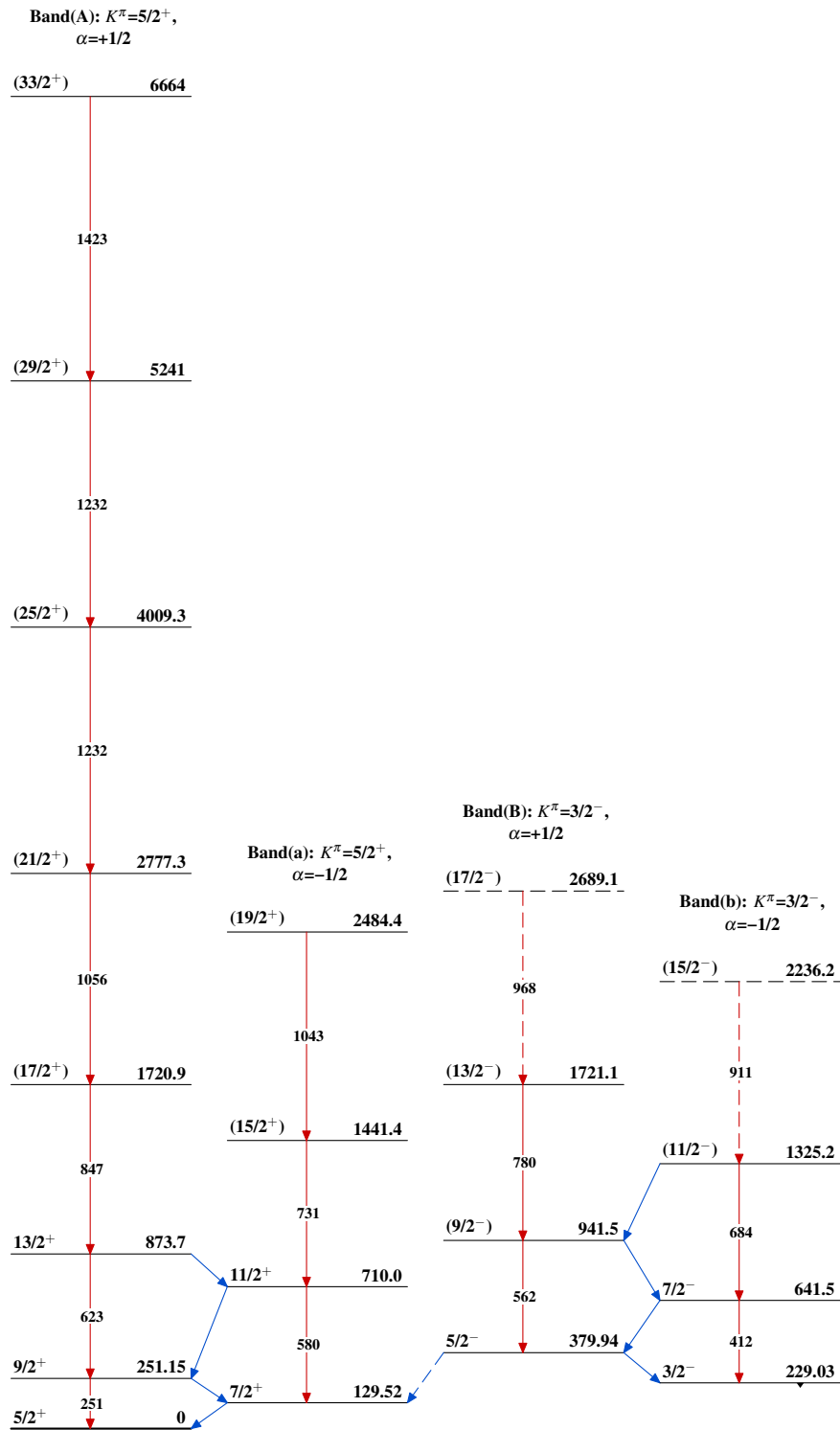
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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



$^{83}_{41}\text{Nb}_{42}$

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