

⁴⁰Ca(⁵⁰Cr,3pn γ), ⁵⁸Ni(³²S,3pn γ) 1991Gr16

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh		NDS 124, 1 (2015)	30-Nov-2014

1991Gr16: E(⁵⁰Cr)=170 MeV, E(³²S)=110, 120, 130 MeV. Measured E γ , I γ , $\gamma\gamma$ and $\gamma\gamma(\theta)$ (DCO) using POLYTESSA array, 5 LEPS, and five Compton-suppressed Ge detectors.

Additional information 1.

⁸⁶Nb Levels

A 1030.4+x level proposed by 1991Gr16 is omitted here. See comment for 782.2 γ .

E(level) [‡]	J [†]	Comments
0	(6 ⁺)	Additional information 2.
26.37 25		E(level): level from 1997Ta10.
274.53 [#] 25	(8 ⁺)	
494.6 [@] 4	(6 ⁻)	
725.2 [#] 4	(9 ⁺)	
888.4 [@] 6	(7 ⁻)	
1134.6 [#] 5	(10 ⁺)	
1284.5 [@] 7	(8 ⁻)	
1601.9 [#] 5	(11 ⁺)	
1712.5 [@] 7	(9 ⁻)	
2028.4 8	(10 ⁻)	E(level): level proposed (evaluator) based on a 2026+x level in (³² S,3pn γ).
2212.7 [#] 7	(12 ⁺)	
2456.9 10		E(level): level from (³² S,3pn γ).
2685.5 [#] 8	(13 ⁺)	
2781.7 [@] 10	(12 ⁻)	E(level): level proposed (evaluator) based on a 2780+x level in (³² S,3pn γ). This replaces 2038+x level in 1991Gr16.
3469.8 [#] 12	(14 ⁺)	
3988.5 [#] 22	(15 ⁺)	
4841.8 [#] 24	(16 ⁺)	

[†] From (³²S,3pn γ). Spin labels J and K in figure 10 of 1991Gr16 correspond to (6⁻) and (8⁺), respectively.

[‡] From least-squares fit to E γ values. The two bands are shown as disconnected in table 3 and figure 10 of 1991Gr16. But using results from (³²S,3pn γ), the two bands are shown here as based on a common level, assumed here as the ground state of ⁸⁶Nb.

[#] Band(A): $\Delta J=1$, band #1.

[@] Band(B): $\Delta J=1$, band #2.

							<u>γ(⁸⁶Nb)</u>		
E γ	I γ	E _i (level)	J _i [†]	E _f	J _f [†]	Mult.	Comments		
26.3 3	45 31	26.37		0	(6 ⁺)		I γ : 45 +35-27 (1991Gr16). Placement from (³² S,3pn γ) (1997Ta10). 1991Gr16 placed this γ from a 274.5+x to 248+x.		
^x 112.2 [†] 4	15 4								
248.1 3	173 10	274.53	(8 ⁺)	26.37		D+Q	Placement from (³² S,3pn γ) (1997Ta10). 1991Gr16 placed this γ from a 248+x level. The 248+x level in 1991Gr16 is omitted here. DCO=0.47 6.		

Continued on next page (footnotes at end of table)

$^{40}\text{Ca}(^{50}\text{Cr},3\text{pn}\gamma), ^{58}\text{Ni}(^{32}\text{S},3\text{pn}\gamma)$ **1991Gr16** (continued) $\gamma(^{86}\text{Nb})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	Comments
274.6 3	96 7	274.53	(8 ⁺)	0	(6 ⁺)	(Q)	DCO=0.77 7.
^x 305.6 [†] 4	12 3						
316.0 4	22 5	2028.4	(10 ⁻)	1712.5	(9 ⁻)		Placement from (³² S,3pn γ) (1997Ta10).
324.8 3	33 4	2781.7	(12 ⁻)	2456.9			
^x 361.0 5	12 4						
393.8 5	63 16	888.4	(7 ⁻)	494.6	(6 ⁻)	D+Q	DCO=0.57 10.
396.5 5	18 8	1284.5	(8 ⁻)	888.4	(7 ⁻)	D+Q	DCO=0.52 12.
409.6 5	18 4	1134.6	(10 ⁺)	725.2	(9 ⁺)		
428.2 4	29 3	1712.5	(9 ⁻)	1284.5	(8 ⁻)	D+Q	DCO=1.10 20.
428.2 [‡]		2456.9		2028.4	(10 ⁻)		
450.7 3	73 5	725.2	(9 ⁺)	274.53	(8 ⁺)	D+Q	DCO=0.61 13.
467.3 3	47 5	1601.9	(11 ⁺)	1134.6	(10 ⁺)	D+Q	DCO=0.43 6.
472.8 5	14 3	2685.5	(13 ⁺)	2212.7	(12 ⁺)	D+Q	DCO=0.53 18.
494.6 4	100	494.6	(6 ⁻)	0	(6 ⁺)	D+Q	DCO=2.21 18.
^x 521.7 6	21 6						Placed from a 3302+x level (1997Ta10).
611.2 8	25 5	2212.7	(12 ⁺)	1601.9	(11 ⁺)		
^x 724.4 7	39 8						
744.1 [‡]		2456.9		1712.5	(9 ⁻)		
753.8 10	27 4	2781.7	(12 ⁻)	2028.4	(10 ⁻)	Q	DCO=2.2 5.
^x 782.2 8	24 5						E_γ : this γ is placed from a 1030.4+x level in 1991Gr16. Neither the 782 γ nor the 1030+x level is reported by 1997Ta10.
790.0 7	31 4	1284.5	(8 ⁻)	494.6	(6 ⁻)		
823.2 7	24 3	1712.5	(9 ⁻)	888.4	(7 ⁻)	Q	DCO=2.2 5.
860.0 5	135 10	1134.6	(10 ⁺)	274.53	(8 ⁺)	Q	DCO=1.20 17.
876.6 8	27 4	1601.9	(11 ⁺)	725.2	(9 ⁺)		
^x 906.4 10	15 8						Placed from a 3687+x level (1997Ta10).
1077.7 8	43 5	2212.7	(12 ⁺)	1134.6	(10 ⁺)	Q	DCO=1.13 15.
1083.6 8	20 4	2685.5	(13 ⁺)	1601.9	(11 ⁺)		
^x 1090.2 10	15 7						Placed from a 4777+x level (1997Ta10).
^x 1126 1	12 6						Placed from a 5442+x level (1997Ta10).
^x 1218 1	14 7						Placed from a 3902+x level (1997Ta10).
1257.1 10	12 4	3469.8	(14 ⁺)	2212.7	(12 ⁺)	Q	DCO=1.1 3.
1303 2	8 4	3988.5	(15 ⁺)	2685.5	(13 ⁺)		
1372 2	8 4	4841.8	(16 ⁺)	3469.8	(14 ⁺)		

[†] γ not reported by 1997Ta10 in (³²S,3pn γ).

[‡] From (³²S,3pn γ).

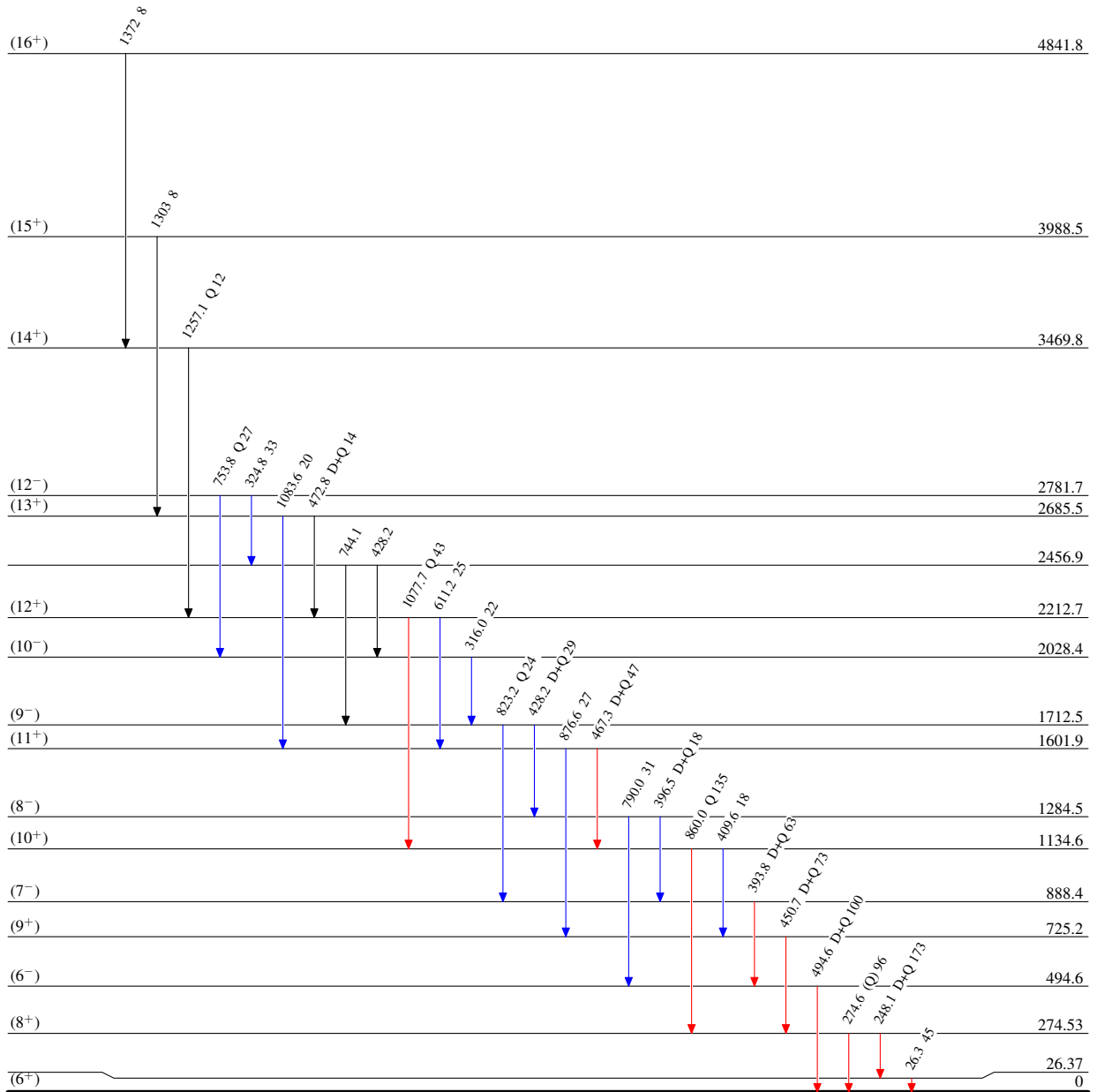
^x γ ray not placed in level scheme.

$^{40}\text{Ca}(^{50}\text{Cr},3\text{pn}\gamma),^{58}\text{Ni}(^{32}\text{S},3\text{pn}\gamma)$ 1991Gr16

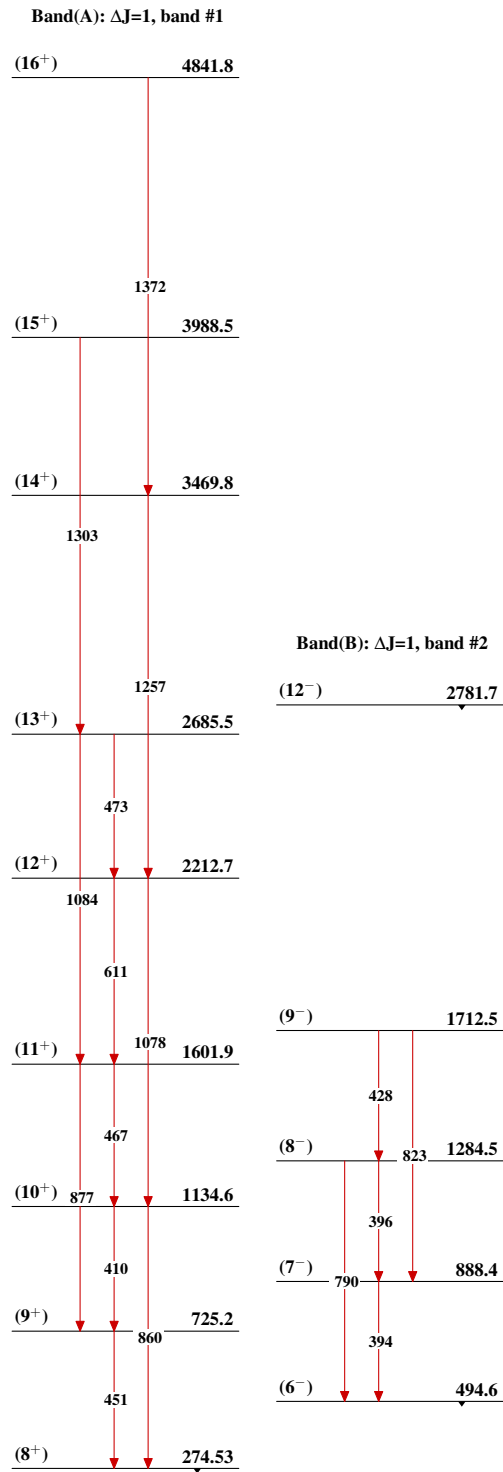
Level Scheme
Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$



$^{86}_{41}\text{Nb}_{45}$

$^{40}\text{Ca}(^{50}\text{Cr},3\text{pn}\gamma), ^{58}\text{Ni}(^{32}\text{S},3\text{pn}\gamma)$ 1991Gr16 $^{86}_{41}\text{Nb}_{45}$