^{128}Te(^{16}O,5nγ):barc 2007Ku12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	P. K. Joshi, B. Singh, S. Singh, A. K. Jain	NDS 138, 1 (2016)	15-Oct-2016

2007Ku12: E=85 MeV beam provided by 14-UD Pelletron accelerator and Bhabha Atomic Research Centre. Enriched target. Measured Eγ, Iγ, $\gamma\gamma(\theta)$, $\gamma\gamma(\theta)$(DCO), γ(lin pol) using six Compton-suppressed Clover Ge detectors at angles of 30°, 90°, 130°, 230°, 270° and 330°. An array of 14 NaI(Tl) detectors was used as a multiplicity filter.

^{139}Nd Levels

E(level)[†]	J$^\pi$	T$_{1/2}$	Comments
0.0	3/2$^+$		$\nu d_{3/2}$ orbital.
231.0[‡] *3*	11/2$^-$	5.50 h *20*	%IT=13.0 *10* T$_{1/2}$: from Adopted Levels. $\nu h^{-1}_{11/2}\otimes(0^+$ of e-e core).
896.4[‡] *4*	15/2$^-$		$\nu h^{-1}_{11/2}\otimes$(first 2$^+$ of e-e core).
1098.9 *4*	13/2$^-$		$\nu h^{-1}_{11/2}\otimes$(first 2$^+$ of e-e core).
1944.0 *5*	15/2$^{(-)}$		$\nu h^{-1}_{11/2}\otimes$(second 2$^+$ of e-e core).
1967.4 *5*	17/2$^-$		$\nu h^{-1}_{11/2}\otimes$(first 4$^+$ of e-e core).
1990.6 *5*	15/2$^-$		
2053.8[‡] *5*	19/2$^-$		$\nu h^{-1}_{11/2}\otimes$(first 4$^+$ of e-e core).
2246.4 *5*	17/2$^{(-)}$		
2542.9 *6*	19/2$^-$		
2571.9[#] *5*	19/2$^+$		
2616.4 *6*	17/2		J$^\pi$: 17/2$^{(-)}$ in figure 1 of 2007Ku12, 17/2 in authors′ table I, the latter should be the assignment according to e-mail reply of Aug 8, 2007 from R. Palit.
2622.9[‡] *5*	21/2$^-$		$\nu h^{-1}_{11/2}\otimes$(first 6$^+$ of e-e core).
2712.0[‡] *5*	23/2$^-$		$\nu h^{-1}_{11/2}\otimes$(first 6$^+$ of e-e core).
2720.9 *5*	19/2$^{(+)}$		
2843.4[#] *5*	21/2$^+$		
3076.9[#] *6*	23/2$^+$		
3079.0 *6*	(21/2)		
3237.9 *7*	(23/2)		
3300.3[#] *6*	25/2$^+$		
3495.8 *7*	27/2$^-$		
3531.5[#] *7*	27/2$^+$		
3730.5 *7*	(25/2)		
3824.2[‡] *6*	25/2$^-$		
3839.6[@] *6*	25/2$^-$		
3967.3[#] *7*	29/2$^+$		
3979.9[@] *6*	27/2$^-$		
4292.5[@] *7*	29/2$^-$		
4333.8[#] *8*	31/2$^+$		
4449.5 *9*	31/2$^-$		
4715.5 *8*	(31/2)		J$^\pi$: (29/2) in figure 1 of 2007Ku12, (31/2$^-$) in authors′ table I. According to e-mail reply of Aug 8, 2007 from R. Palit J^π should be (31/2).
4755.5[@] *8*	31/2$^-$		
4803.8 *9*	(31/2)		
4822.0 *9*	(31/2$^+$)		
4855.1 *9*	33/2$^+$		
4912.2[#] *9*	33/2$^+$		
5114.7 *9*	33/2$^+$		

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^{139}Nd Levels (continued)

E(level)[†]	J$^\pi$	Comments
5165.3 *10*	(35/2$^+$)	
5289.0 *9*	33/2$^-$	
5391.5[@] *9*	33/2$^-$	
5520.7 *9*	(35/2$^+$)	
5549.5 *10*	(35/2)	J$^\pi$: (31/2) in figure 1 of 2007Ku12, (35/2$^-$) in authors′ table I. According to e-mail reply of Aug 8, 2007 from one of the authors, J^π should be (35/2).
5694.7[@] *10*	35/2$^-$	
6114.6[@] *10*	37/2$^-$	
6377.0 *12*	(39/2)	J$^\pi$: (39/2) in figure 1 of 2007Ku12, (39/2$^+$) in authors′ table I. According to e-mail reply of Aug 8, 2007 from one of the authors, J^π should be (39/2).
6490.2[@] *10*	39/2$^-$	
7101.9[@] *12*	(41/2)	

[†] From least-squares fit to Eγ data.
[‡] Band(A): Band built on $\nu h^{-1}_{11/2}$. Triaxial rotor plus particle configuration.
[#] Band(B): $\pi[h_{11/2}g_{7/2}]\otimes\nu h_{11/2}$.
[@] Band(C): $\pi h^2_{11/2}\otimes\nu h^{-1}_{11/2}$. Tentative assignment as a magnetic-dipole rotational band. Crosses $\pi[h^2_{11/2}g^2_{7/2}]\otimes\nu h_{11/2}$ configuration at 33/2$^-$.

γ(^{139}Nd)

DCO′s obtained with gate on 665.4-keV transition with ΔJ=2, quadrupole, unless noted otherwise.

E$_\gamma$[†]	I$_\gamma$	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.	Comments
86.4 *5*	3.1 *5*	2053.8	19/2$^-$	1967.4	17/2$^-$	[M1]	
89.0 *3*	14.43 *23*	2712.0	23/2$^-$	2622.9	21/2$^-$	D	DCO=0.49 *6*
104.5 *5*	5.22 *18*	2720.9	19/2$^{(+)}$	2616.4	17/2	D	DCO=0.54 *9*
122.5 *3*	16.2 *3*	2843.4	21/2$^+$	2720.9	19/2$^{(+)}$	D	DCO=0.61 *6*
140.3 *3*	16.4 *3*	3979.9	27/2$^-$	3839.6	25/2$^-$	D	DCO=0.41 *5*
149.0 *5*	8.56 *24*	2720.9	19/2$^{(+)}$	2571.9	19/2$^+$	D	DCO=0.71 *13* Mult.: ΔJ=0 transition.
155.7 *5*	6.49 *19*	3979.9	27/2$^-$	3824.2	25/2$^-$	D	DCO=0.56 *11*
158.9 *5*	4.2 *3*	3237.9	(23/2)	3079.0	(21/2)		
169.2 *5*	2.0 *3*	2712.0	23/2$^-$	2542.9	19/2$^-$		
223.4 *3*	40.8 *8*	3300.3	25/2$^+$	3076.9	23/2$^+$	D	DCO=0.62 *4*
231.0 *3*		231.0	11/2$^-$	0.0	3/2$^+$	M4	Mult.: from Adopted Gammas.
231.2 *3*	35.5 *11*	3531.5	27/2$^+$	3300.3	25/2$^+$	D	DCO=0.61 *5*
233.6 *3*	43.9 *14*	3076.9	23/2$^+$	2843.4	21/2$^+$	D	DCO=0.68 *7*
249.4 *5*	2.99 *15*	3979.9	27/2$^-$	3730.5	(25/2)		
255.8[‡] *5*	8.50 *23*	2246.4	17/2$^{(-)}$	1990.6	15/2$^-$	D	DCO=0.85 *17*
271.4 *3*	30.7 *7*	2843.4	21/2$^+$	2571.9	19/2$^+$	D	DCO=0.71 *7*
302.4 *5*	7.26 *23*	2246.4	17/2$^{(-)}$	1944.0	15/2$^{(-)}$		
303.2 *5*	8.3 *4*	5694.7	35/2$^-$	5391.5	33/2$^-$	D	DCO=0.61 *8*
310.2 *5*	4.9 *3*	5165.3	(35/2$^+$)	4855.1	33/2$^+$		
312.6 *3*	27.7 *6*	4292.5	29/2$^-$	3979.9	27/2$^-$	M1	DCO=0.52 *5* POL=−0.05 *2*.
325.5[‡] *5*	3.42 *15*	2571.9	19/2$^+$	2246.4	17/2$^{(-)}$	D	DCO=0.96 *19*
358.1 *5*	2.88 *17*	3079.0	(21/2)	2720.9	19/2$^{(+)}$		

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γ(^{139}Nd) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
366.5 *3*	18.8 *3*	4333.8	31/2$^+$	3967.3	29/2$^+$	M1	DCO=0.54 *8* POL=−0.13 *3*.
375.6 *3*	10.23 *18*	6490.2	39/2$^-$	6114.6	37/2$^-$	(M1)	DCO=0.41 *6* POL=−0.02 *2*.
405.7 *5*	6.17 *19*	5694.7	35/2$^-$	5289.0	33/2$^-$	M1	DCO=0.56 *11* POL=−0.04 *2*.
419.9 *3*	11.7 *5*	6114.6	37/2$^-$	5694.7	35/2$^-$	D	DCO=0.41 *6*
423.0[#] *5*	5.40 *23*	4715.5	(31/2)	4292.5	29/2$^-$	D	DCO=1.15 *12*
435.8 *3*	29.2 *4*	3967.3	29/2$^+$	3531.5	27/2$^+$	M1	DCO=0.44 *4* POL=−0.12 *3*.
448.4[@] *5*	<2	3979.9	27/2$^-$	3531.5	27/2$^+$		
463.0 *5*	22.1 *5*	4755.5	31/2$^-$	4292.5	29/2$^-$	M1	DCO=0.44 *7* POL=−0.04 *2*.
474.5[‡] *3*	13.72 *25*	2720.9	19/2$^{(+)}$	2246.4	17/2$^{(-)}$	E1	DCO=1.05 *14* POL=+0.09 *4*.
492.7 *5*	2.65 *23*	3730.5	(25/2)	3237.9	(23/2)		
521.3 *5*	9.87 *18*	4855.1	33/2$^+$	4333.8	31/2$^+$	M1	DCO=0.64 *11* POL=−0.15 *6*.
533.5 *5*	9.34 *23*	5289.0	33/2$^-$	4755.5	31/2$^-$	(M1)	DCO=0.50 *5* POL=−0.010 *11*.
569.0 *3*	31.2 *7*	2622.9	21/2$^-$	2053.8	19/2$^-$	M1	DCO=0.42 *5* POL=−0.030 *16*.
578.4 *5*	7.0 *3*	4912.2	33/2$^+$	4333.8	31/2$^+$	M1	DCO=0.57 *17* POL=−0.19 *5*.
601.8[@] *5*	2.80 *19*	3839.6	25/2$^-$	3237.9	(23/2)		
604.5 *3*	40.7 *11*	2571.9	19/2$^+$	1967.4	17/2$^-$	E1	DCO=0.68 *6* POL=+0.07 *3*.
611.7 *5*	3.5 *3*	7101.9	(41/2)	6490.2	39/2$^-$		
636.0 *3*	11.4 *3*	5391.5	33/2$^-$	4755.5	31/2$^-$	M1	DCO=0.51 *8* POL=−0.12 *5*.
655.4 *5*	3.3 *3*	2622.9	21/2$^-$	1967.4	17/2$^-$		
658.3 *5*	4.5 *8*	2712.0	23/2$^-$	2053.8	19/2$^-$		
665.4[‡] *3*	100	896.4	15/2$^-$	231.0	11/2$^-$	E2	DCO=2.11 *14* POL=+0.14 *3*.
679.6 *5*	2.0 *4*	3979.9	27/2$^-$	3300.3	25/2$^+$		
761.0[@] *5*		4292.5	29/2$^-$	3531.5	27/2$^+$		DCO<2.0
762.7 *5*	3.0 *6*	3839.6	25/2$^-$	3076.9	23/2$^+$		
780.9 *5*	4.1 *4*	5114.7	33/2$^+$	4333.8	31/2$^+$		
783.8 *5*	8.16 *23*	3495.8	27/2$^-$	2712.0	23/2$^-$	E2	DCO=0.87 *16* POL=+0.10 *3*.
802.3 *5*	6.81 *17*	4333.8	31/2$^+$	3531.5	27/2$^+$	E2	DCO=0.87 *17* POL=+0.13 *5*.
834.0 *5*	6.0 *6*	5549.5	(35/2)	4715.5	(31/2)	Q	DCO=1.3 *4* Initial level energy=4715.6 listed in table I of 2007Ku12 is a misprint according to e-mail reply from one of the authors.
845.1 *5*	5.9 *4*	1944.0	15/2$^{(-)}$	1098.9	13/2$^-$		
854.7 *5*	3.91 *23*	4822.0	(31/2$^+$)	3967.3	29/2$^+$		
867.9[‡] *3*	21.7 *4*	1098.9	13/2$^-$	231.0	11/2$^-$	M1	DCO=0.83 *9* POL=−0.06 *2*.
891.7[‡] *3*	13.1 *3*	1990.6	15/2$^-$	1098.9	13/2$^-$	(M1)	DCO=1.04 *13* POL=−0.02 *3*.
953.7 *5*	3.9 *3*	4449.5	31/2$^-$	3495.8	27/2$^-$	Q	DCO=1.02 *18*
1025.2 *5*	3.5 *3*	3079.0	(21/2)	2053.8	19/2$^-$		

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^{128}Te(^{16}O,5nγ):barc 2007Ku12 (continued)

γ(^{139}Nd) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
1071.0 *3*	43.5 *13*	1967.4	17/2$^-$	896.4	15/2$^-$	M1	DCO=0.39 *4* POL=−0.07 *2*.
1112.2 *5*	6.65 *17*	3824.2	25/2$^-$	2712.0	23/2$^-$	(M1)	DCO=0.49 *10* POL=−0.01 *2*.
1127.6 *3*	15.6 *3*	3839.6	25/2$^-$	2712.0	23/2$^-$	M1	DCO=0.37 *6* POL=−0.12 *7*.
1157.4 *3*	38.1 *12*	2053.8	19/2$^-$	896.4	15/2$^-$	E2	DCO=1.10 *8* POL=+0.08 *3*.
1186.9 *5*	2.9 *3*	5520.7	(35/2$^+$)	4333.8	31/2$^+$		
1211.7 *5*	3.17 *23*	6377.0	(39/2)	5165.3	(35/2$^+$)		
1308.0 *5*	2.3 *4*	4803.8	(31/2)	3495.8	27/2$^-$		
1350.0 *5*	4.3 *2*	2246.4	17/2$^{(-)}$	896.4	15/2$^-$		
1646.5 *5*	4.4 *5*	2542.9	19/2$^-$	896.4	15/2$^-$	Q	DCO=1.18 *8*
1713.0[‡] *5*	3.0 *3*	1944.0	15/2$^{(-)}$	231.0	11/2$^-$	Q	DCO=2.2 *5*
1720.0 *5*	9.6 *8*	2616.4	17/2	896.4	15/2$^-$	D	DCO=0.48 *10*

[†] Uncertainty assigned as 0.3 keV for Iγ>10 and 0.5 keV for Iγ<10, based on a general statement by 2007Ku12.
[‡] DCO obtained with gate on 233.6-keV transition with ΔJ=1, dipole or dipole+quadrupole.
[#] DCO obtained with gate on 312.6-keV transition with ΔJ=1, dipole or dipole+quadrupole.
[@] Placement of transition in the level scheme is uncertain.

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Level Scheme

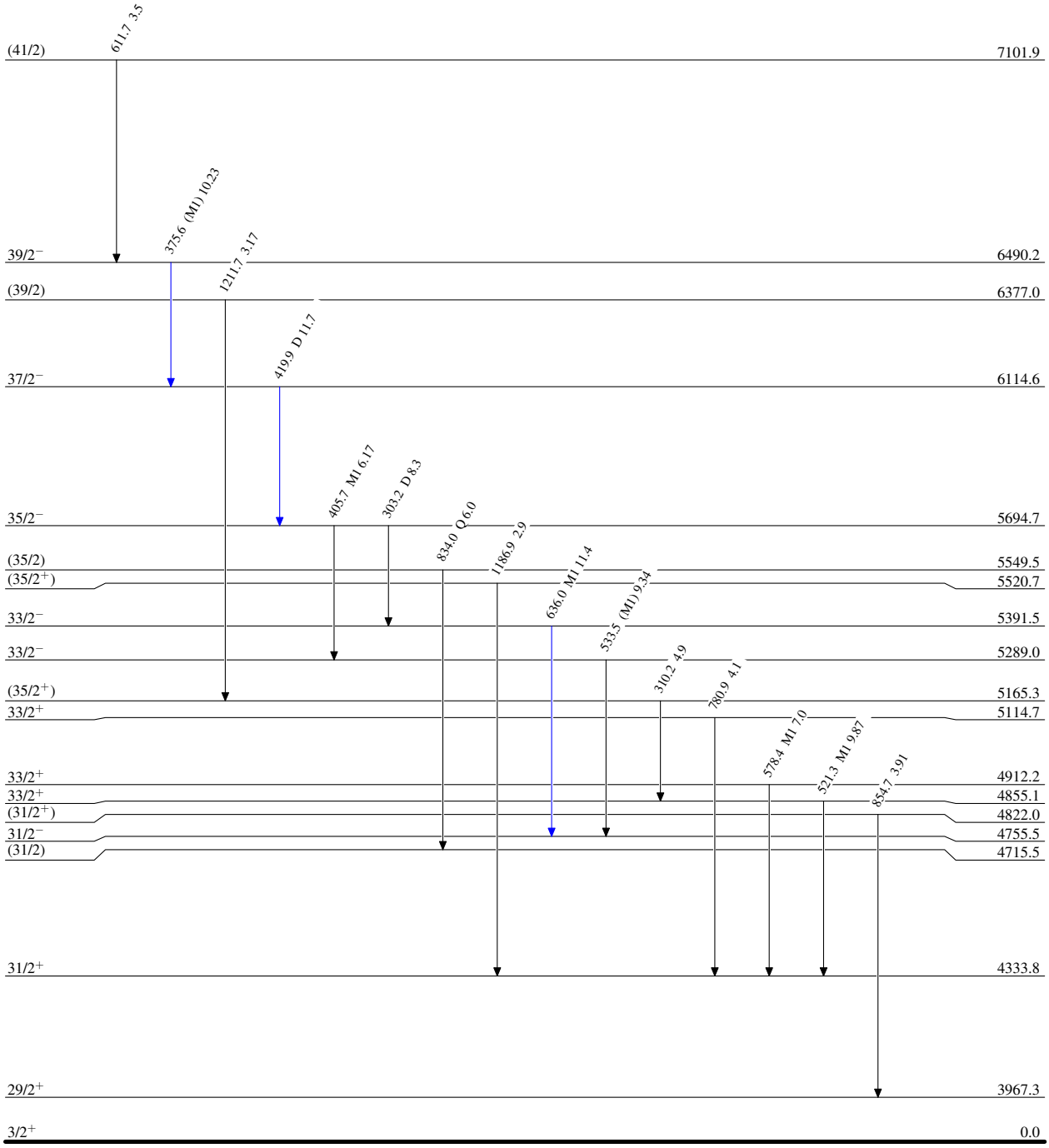
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



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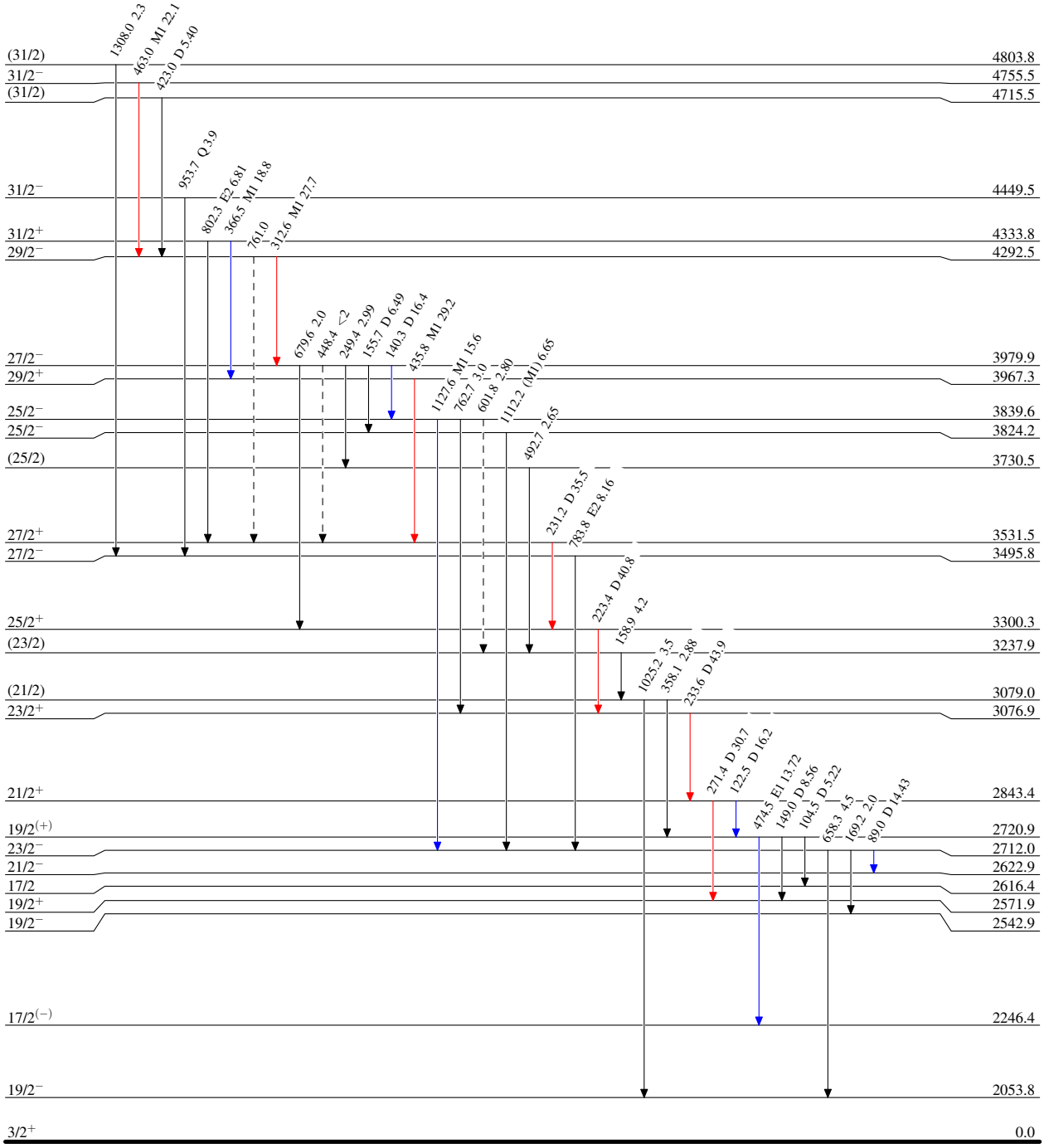
Level Scheme (continued)

Intensities: Relative I_γ

Legend

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



$^{139}_{60}Nd_{79}$

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Level Scheme (continued)

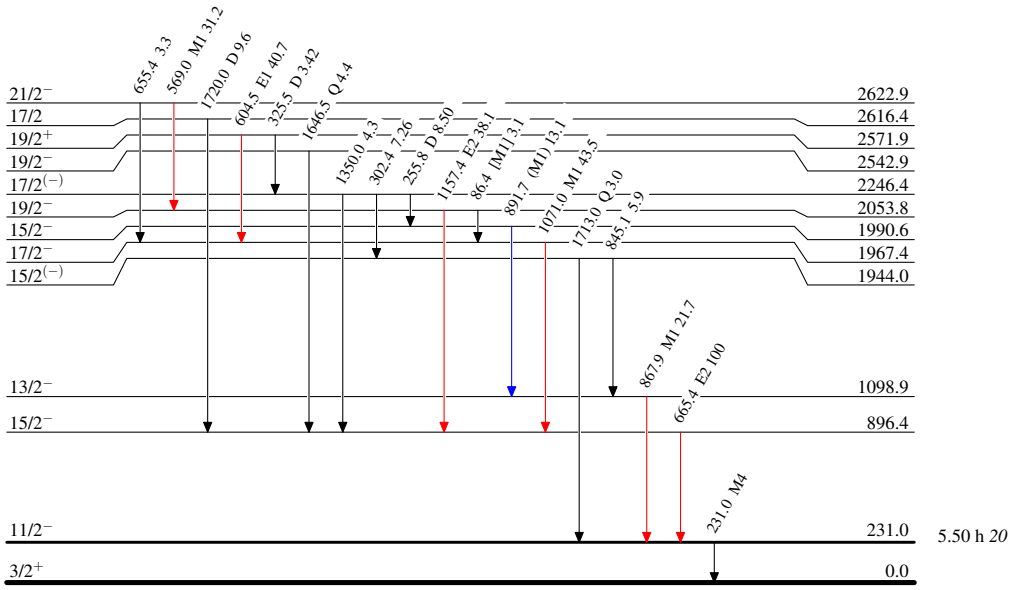
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



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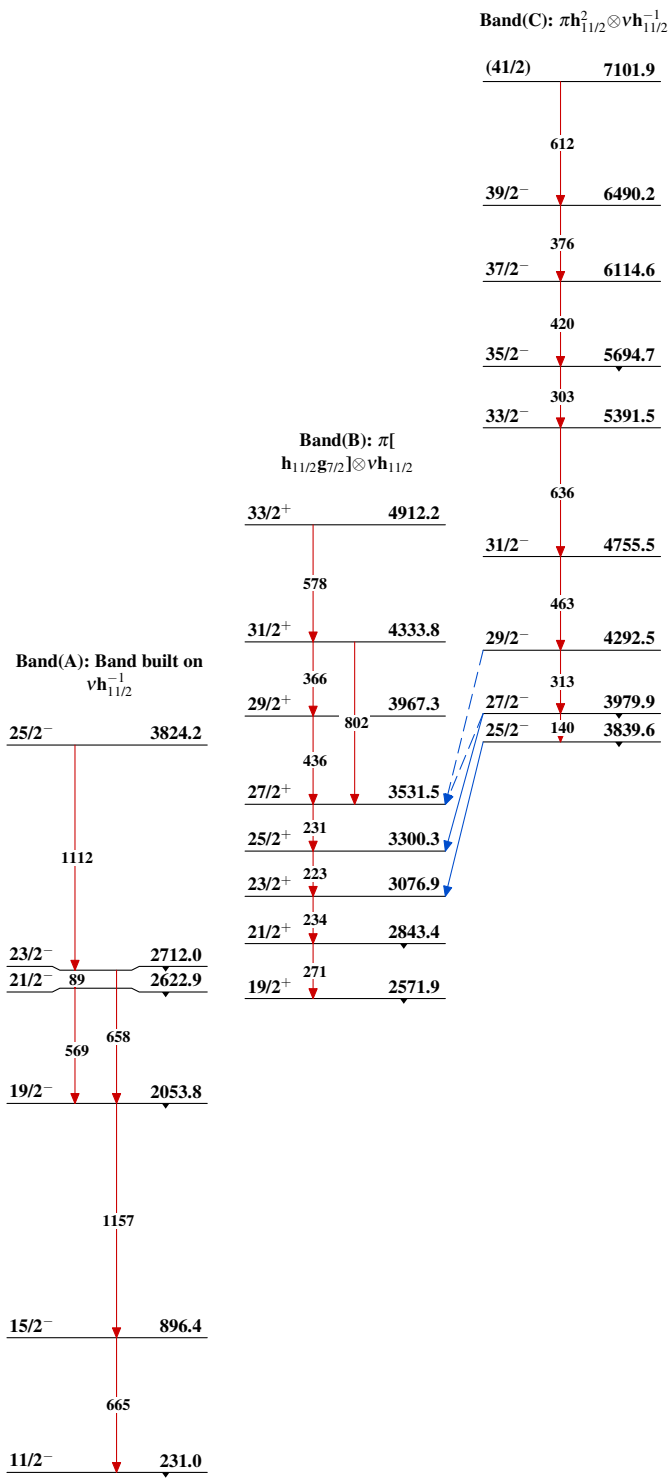

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