^{163}Dy(^{16}O,4nγ) 1978Wa16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 102, 719 (2004)	1-Jun-2004

E(^{16}O)=83-89 MeV. Measured Eγ, Iγ, $\gamma\gamma$ coin, nγ coin, $\gamma(\theta)$. Ge(Li), Ge, NE213 detectors.

^{175}W Levels

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
0.0[#]	(1/2$^-$)		
75.02[#] *9*	(3/2$^-$)		
89.21[#] *9*	(5/2$^-$)		
104.03[@] *17*	(5/2$^-$)	45 ns *12*	$T_{1/2}$: from $\gamma\gamma$(t).
196.27[@] *17*	(7/2$^-$)		
234.95[&] *15*	(7/2$^+$)	216 ns *6*	$T_{1/2}$: from nγ(t).
259.65[#] *12*	(7/2$^-$)		
265.60[&] *23*	(9/2$^+$)		
284.13[#] *14*	(9/2$^-$)		
314.52[@] *19*	(9/2$^-$)		
330.56[&] *21*	(11/2$^+$)		
409.11[&] *22*	(13/2$^+$)		
457.47[@] *20*	(11/2$^-$)		
540.34[#] *17*	(11/2$^-$)		
550.79[&] *22*	(15/2$^+$)		
573.53[#] *17*	(13/2$^-$)		
623.69[@] *21*	(13/2$^-$)		
660.70[&] *23*	(17/2$^+$)		
812.16[@] *23*	(15/2$^-$)		
891.69[&] *24*	(19/2$^+$)		
905.26[#] *22*	(15/2$^-$)		
944.26[#] *21*	(17/2$^-$)		
1016.05[&] *25*	(21/2$^+$)		
1019.91[@] *24*	(17/2$^-$)		
1246.5[@] *3*	(19/2$^-$)		
1339.3[&] *3*	(23/2$^+$)		
1343.1[#] *3*	(19/2$^-$)		
1384.0[#] *3*	(21/2$^-$)		
1469.3[&] *3*	(25/2$^+$)		
1488.0[@] *3*	(21/2$^-$)		
1746.9?[@] *3*	(23/2$^-$)		
1844.4[#] *3*	(23/2$^-$)		
1876.7[&] *3*	(27/2$^+$)		
1881.7[#] *3*	(25/2$^-$)		
2007.3[@] *3*	(25/2$^-$)		
2011.4[&] *3*	(29/2$^+$)		
2410.7[#] *3*	(29/2$^-$)		
2484.4[&] *3*	(31/2$^+$)		
2629.7[&] *4*	(33/2$^+$)		

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^{163}Dy(^{16}O,4nγ) 1978Wa16 (continued)

^{175}W Levels (continued)

E(level)[†]	Jπ[‡]
2908.4[#] *4*	(33/2$^-$)
3142.3[&] *4*	(35/2$^+$)
3310.7[&] *4*	(37/2$^+$)
3447.2[#] *4*	(37/2$^-$)
4038.7[&] *5*	(41/2$^+$)

[†] Deduced by evaluator from a least-squares fit to γ-ray energies.
[‡] Spin assignments are based on rotational structure, γ-ray decay patterns, $\gamma(\theta)$ and systematics of N=101 nuclei.
[#] 1/2(521) band.
[@] 5/2(512) band.
[&] 7/2(633), strongly mixed by Coriolis coupling with the other members of the i13/2 intruder orbital.

γ(^{175}W)

Eγ	Iγ	Ei(level)	Jiπ	Ef	Jfπ	Mult.	δ[†]	Comments
(14.2[‡])		89.21	(5/2$^-$)	75.02	(3/2$^-$)			
(14.8[‡])		104.03	(5/2$^-$)	89.21	(5/2$^-$)			
(24.5[‡])		284.13	(9/2$^-$)	259.65	(7/2$^-$)			
(29.0[‡])		104.03	(5/2$^-$)	75.02	(3/2$^-$)			
(30.7[‡])		265.60	(9/2$^+$)	234.95	(7/2$^+$)			
38.69 *10*	267 *30*	234.95	(7/2$^+$)	196.27	(7/2$^-$)	E1		Mult.: from α(exp)<3, based on transition intensity balance.
64.91 *10*	108 *11*	330.56	(11/2$^+$)	265.60	(9/2$^+$)	(M1+E2)	0.34 *6*	Mult.: from intensity balance at 331-keV level and theoretical α.
75.00 *10*	20 *5*	75.02	(3/2$^-$)	0.0	(1/2$^-$)			Iγ: delayed Iγ=67 *7*.
78.54 *10*	48 *5*	409.11	(13/2$^+$)	330.56	(11/2$^+$)			
[x]84.95 *15*	8 *2*							
89.23 *10*	11 *3*	89.21	(5/2$^-$)	0.0	(1/2$^-$)			Iγ: delayed Iγ=29 *4*.
92.25 *10*	25 *5*	196.27	(7/2$^-$)	104.03	(5/2$^-$)			Iγ: delayed Iγ=72 *9*.
95.60 *15*	16[#] *3*	330.56	(11/2$^+$)	234.95	(7/2$^+$)			
[x]104.21 *15*	10 *2*							
109.96 *15*	33 *10*	660.70	(17/2$^+$)	550.79	(15/2$^+$)			
[x]117.10 *25*	17 *4*							
118.26 *12*	42 *5*	314.52	(9/2$^-$)	196.27	(7/2$^-$)	(M1+E2)	−0.7 *+3 −7*	A_2=−0.51 *14*; A_4=−0.10 *16*.
124.32 *15*	16 *2*	1016.05	(21/2$^+$)	891.69	(19/2$^+$)			
130.92 *10*	233 *23*	234.95	(7/2$^+$)	104.03	(5/2$^-$)			A_2=−0.088 *13*; A_4=+0.030 *16*.
141.73 *12*	119 *15*	550.79	(15/2$^+$)	409.11	(13/2$^+$)			A_2=−0.52 *4*; A_4=+0.10 *4* for doublet.
142.96 *16*	≤100[@]	457.47	(11/2$^-$)	314.52	(9/2$^-$)			A_2=−0.52 *4*; A_4=+0.10 *4* for doublet.
143.80 *25*	≤100[@]	409.11	(13/2$^+$)	265.60	(9/2$^+$)			
145.74 *12*	16 *4*	234.95	(7/2$^+$)	89.21	(5/2$^-$)			
166.21 *15*	33 *4*	623.69	(13/2$^-$)	457.47	(11/2$^-$)			
170.50 *20*	8 *3*	259.65	(7/2$^-$)	89.21	(5/2$^-$)			
[x]172.85 *16*	23 *4*							
184.62 *10*	71 *7*	259.65	(7/2$^-$)	75.02	(3/2$^-$)			
188.45 *14*	21 *3*	812.16	(15/2$^-$)	623.69	(13/2$^-$)			
194.92 *10*	165 *17*	284.13	(9/2$^-$)	89.21	(5/2$^-$)			A_2=+0.229 *20*; A_4=−0.012 *25*.
[x]205.00 *20*	14 *5*							
207.74[e] *20*	17 *3*	1019.91	(17/2$^-$)	812.16	(15/2$^-$)			

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^{163}Dy(^{16}O,4nγ) 1978Wa16 (continued)

$\gamma(^{175}W)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
210.46[e] *20*	14 *4*	314.52	(9/2$^-$)	104.03	(5/2$^-$)		
220.21 *10*	126 *10*	550.79	(15/2$^+$)	330.56	(11/2$^+$)		A_2=+0.251 *19*; A_4=−0.028 *25*.
231.00 *10*	68 *10*	891.69	(19/2$^+$)	660.70	(17/2$^+$)	(M1+E2)	δ: −0.38 *9* or −1.7 *2* from angular distribution and deduced from relative intensities and conversion coefficients. A_2=−0.71 *4*; A_4=0.13 *4*.
251.58 *10*	183 *18*	660.70	(17/2$^+$)	409.11	(13/2$^+$)		A_2=+0.236 *17*; A_4=−0.049 *20*.
261.21 *14*	27 *6*	457.47	(11/2$^-$)	196.27	(7/2$^-$)		
280.69 *12*	87 *10*	540.34	(11/2$^-$)	259.65	(7/2$^-$)		A_2=+0.19 *3*; A_4=+0.00 *4*.
289.40 *10*	191 *20*	573.53	(13/2$^-$)	284.13	(9/2$^-$)		A_2=+0.281 *18*; A_4=−0.073 *20*.
309.15 *14*	61 *10*	623.69	(13/2$^-$)	314.52	(9/2$^-$)		A_2=+0.24 *3*; A_4=−0.02 *3*.
323.24 *15*	30 *6*	1339.3	(23/2$^+$)	1016.05	(21/2$^+$)	(M1+E2)	δ: −0.34 *15* or −1.9 *8* from angular distribution and deduced from relative intensities and conversion coefficients. A_2=−0.68 *9*; A_4=+0.04 *10*.
340.88 *12*	185 *20*	891.69	(19/2$^+$)	550.79	(15/2$^+$)		A_2=+0.297 *20*; A_4=−0.074 *25*.
354.74 *20*	≤325[&]	812.16	(15/2$^-$)	457.47	(11/2$^-$)		A_2=+0.287 *12*; A_4=−0.090 *14* for doublet.
355.34 *15*	≤325[&]	1016.05	(21/2$^+$)	660.70	(17/2$^+$)		A_2=+0.287 *12*; A_4=−0.090 *14* for doublet.
364.92 *14*	96 *12*	905.26	(15/2$^-$)	540.34	(11/2$^-$)		A_2=+0.25 *4*; A_4=−0.05 *4*.
370.72 *12*	176 *18*	944.26	(17/2$^-$)	573.53	(13/2$^-$)		A_2=+0.315 *16*; A_4=−0.104 *20*.
396.22 *14*	86 *10*	1019.91	(17/2$^-$)	623.69	(13/2$^-$)		A_2=+0.294 *22*; A_4=−0.14 *3*.
434.35 *15*	81[#] *12*	1246.5	(19/2$^-$)	812.16	(15/2$^-$)		A_2=+0.259 *18*; A_4=−0.072 *21* for doublet with 432.93γ of ^{174}W.
437.86 *15*	≤638[a#]	1343.1	(19/2$^-$)	905.26	(15/2$^-$)		A_2=−0.080 *15*; A_4=+0.020 *16* for triplet with 439.76γ of ^{175}W and 440.80γ of ^{176}W.
439.76 *15*	≤638[a#]	1384.0	(21/2$^-$)	944.26	(17/2$^-$)		A_2=−0.080 *15*; A_4=+0.020 *16* for triplet with 439.76γ of ^{175}W and 440.80γ of ^{176}W.
447.68 *14*	178 *30*	1339.3	(23/2$^+$)	891.69	(19/2$^+$)		A_2=+0.35 *4*; A_4=−0.30 *6*.
453.29 *14*	192 *30*	1469.3	(25/2$^+$)	1016.05	(21/2$^+$)		A_2=+0.339 *21*; A_4=−0.178 *25*.
468.10 *16*	43 *8*	1488.0	(21/2$^-$)	1019.91	(17/2$^-$)		A_2=+0.28 *5*; A_4=−0.07 *6*.
497.70[d] *15*	310[d#] *30*	1881.7	(25/2$^-$)	1384.0	(21/2$^-$)		
497.70[d] *15*	310[d#] *30*	2908.4	(33/2$^-$)	2410.7	(29/2$^-$)		A_2=+0.306 *25*; A_4=−0.09 *3* for doublet with 498.51γ in ^{174}W.
500.34[e] *20*	≤128[b]	1746.9?	(23/2$^-$)	1246.5	(19/2$^-$)		A_2=+0.29 *5*; A_4=−0.16 *6* for doublet.
501.26 *15*	≤128[b]	1844.4	(23/2$^-$)	1343.1	(19/2$^-$)		A_2=+0.29 *5*; A_4=−0.16 *6* for doublet.
519.28 *15*	35 *8*	2007.3	(25/2$^-$)	1488.0	(21/2$^-$)		A_2=+0.29 *7*; A_4=−0.12 *8*.
528.96 *15*	59 *6*	2410.7	(29/2$^-$)	1881.7	(25/2$^-$)		A_2=+0.37 *4*; A_4=−0.09 *5*.
537.40 *15*	≤159[c]	1876.7	(27/2$^+$)	1339.3	(23/2$^+$)		A_2=+0.28 *4*; A_4=−0.09 *4* for doublet.
538.80 *20*	≤159[c]	3447.2	(37/2$^-$)	2908.4	(33/2$^-$)		A_2=+0.28 *4*; A_4=−0.09 *4* for doublet.
542.04 *15*	145 *15*	2011.4	(29/2$^+$)	1469.3	(25/2$^+$)		A_2=+0.290 *23*; A_4=−0.109 *25*.
607.66 *15*	68 *20*	2484.4	(31/2$^+$)	1876.7	(27/2$^+$)		A_2=+0.38 *5*; A_4=−0.15 *6*.
618.29 *15*	83 *15*	2629.7	(33/2$^+$)	2011.4	(29/2$^+$)		A_2=+0.22 *4*; A_4=−0.08 *5*.
657.90 *20*	37 *10*	3142.3	(35/2$^+$)	2484.4	(31/2$^+$)		A_2=+0.35 *7*; A_4=−0.12 *9*.
681.00 *20*	41 *10*	3310.7	(37/2$^+$)	2629.7	(33/2$^+$)		A_2=+0.34 *6*; A_4=−0.23 *8*.
728.00 *25*	9 *4*	4038.7	(41/2$^+$)	3310.7	(37/2$^+$)		A_2=+0.45 *20*; A_4=−0.22 *23*.

† From angular distribution and deduced from relative intensities and conversion coefficients.
‡ Inferred from coincidence relationships.
# Contaminated with lines in neighboring Hf and W isotopes.
@ Iγ(142.96γ + 143.80γ)=80 *20*.

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^{163}Dy(^{16}O,4nγ) 1978Wa16 (continued)

$\gamma(^{175}W)$ (continued)

[&] Iγ(354.74γ + 355.34γ)=295 *30*.
[a] Iγ(437.86γ + 439.76γ)=578 *60*.
[b] Iγ(500.34γ + 501.26γ)=103 *25*.
[c] Iγ(537.40γ + 538.80γ)=144 *15*.
[d] Multiply placed with undivided intensity.
[e] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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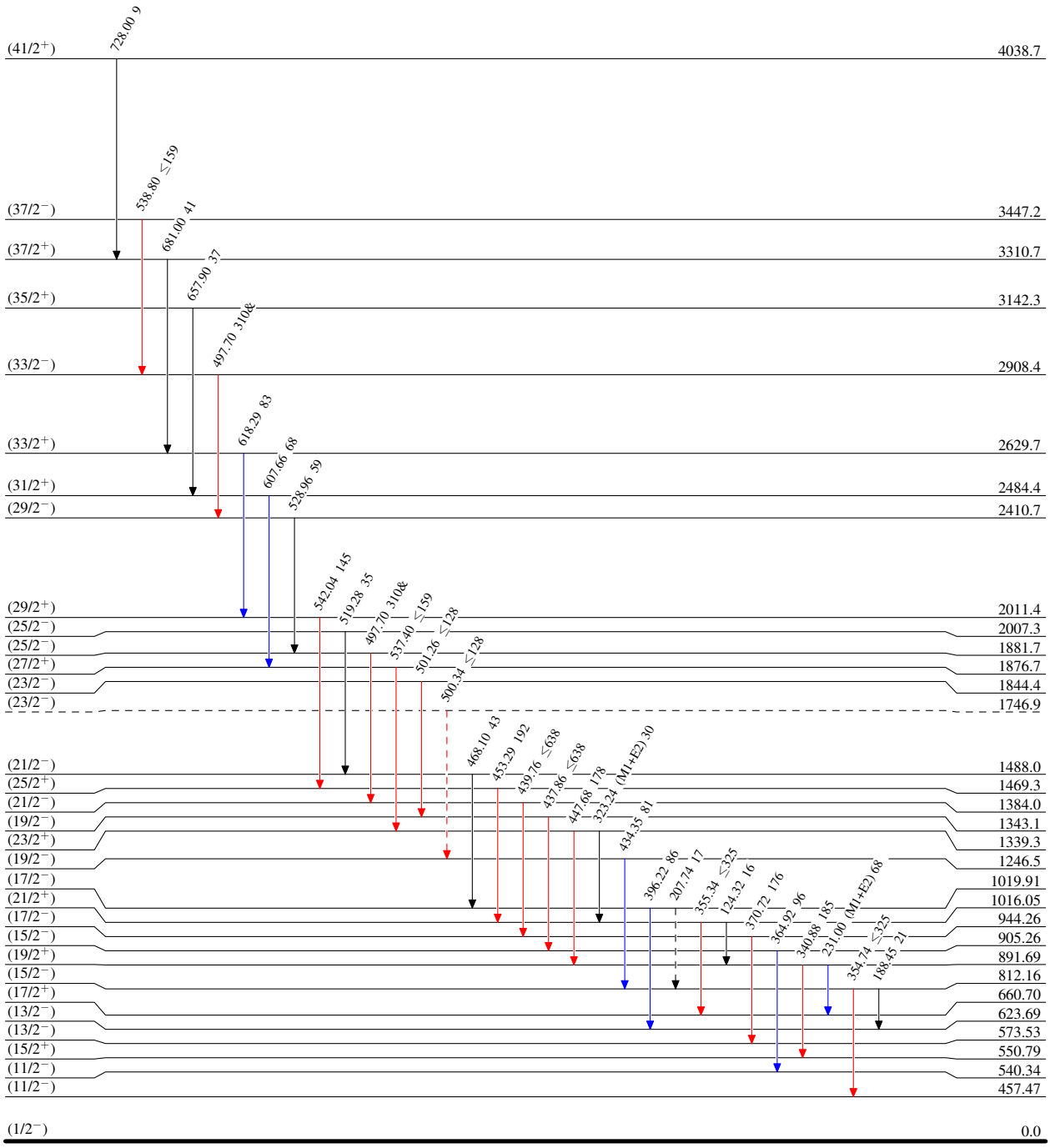
Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



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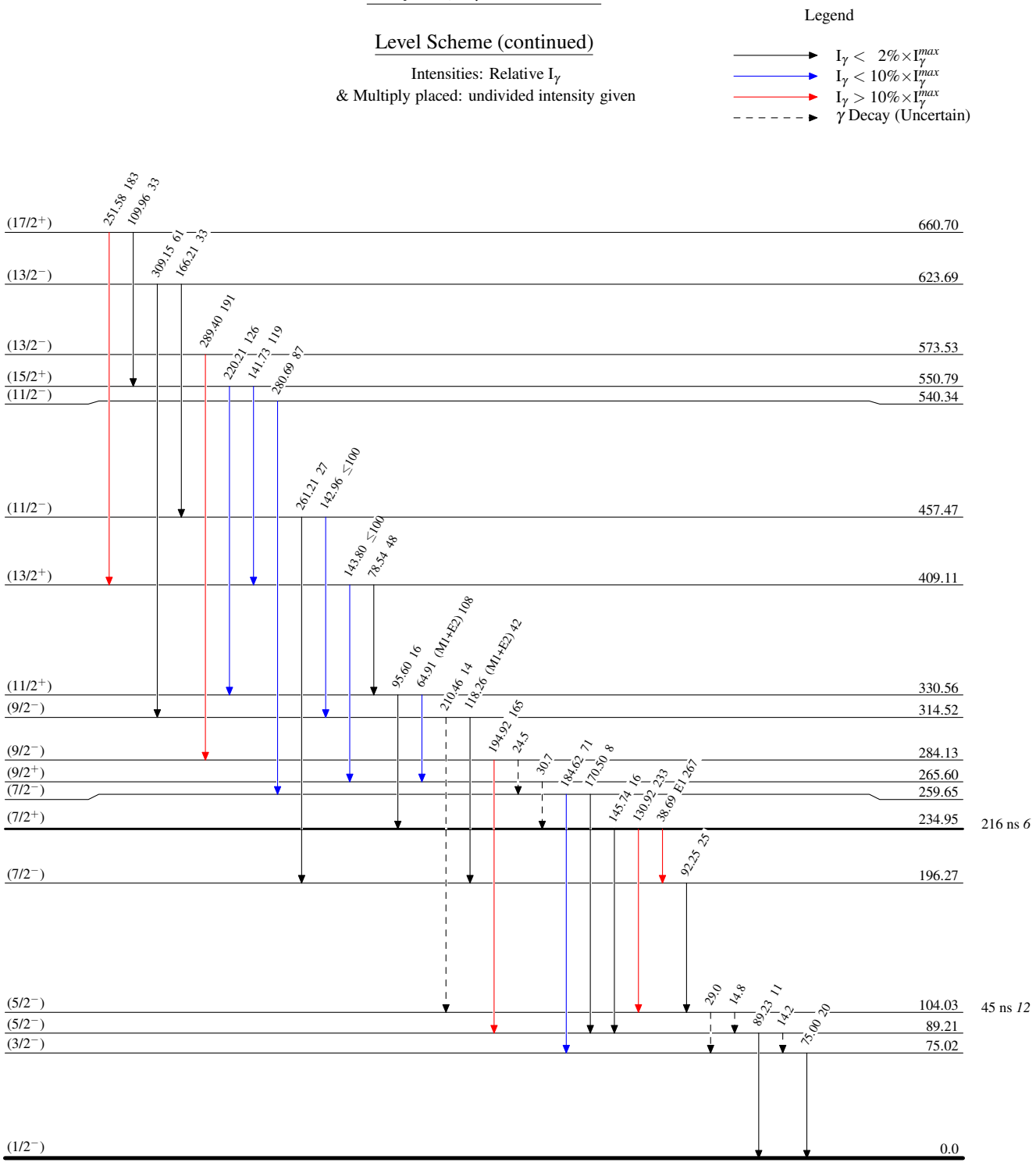
^{163}Dy(^{16}O,4nγ) 1978Wa16

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given



$^{175}_{74}W_{101}$