^{161}Dy(^{16}O,4nγ) 1978Wa16

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

E(^{16}O)=89 MeV; Dy targets enriched to 96% in ^{161}Dy; measured γ-ray yields at 7 angles between 0° and 90° (large-volume Ge(Li)) and at 5 angles between 0° and 90° (small-volume intrinsic germanium), Eγ, Iγ, $\gamma\gamma$ coin, γ-ray angular distributions, $\gamma\gamma$(t); constructed level scheme consisting of 3 rotational bands built on probable single-particle configurations.

^{173}W Levels

E(level)	J$^\pi$[†]	T$_{1/2}$[‡]	E(level)	J$^\pi$[†]	E(level)	J$^\pi$[†]
0.0	5/2$^-$		555.46+x *24*	(13/2$^-$)	1843.5 *8*	25/2$^-$
0.0+x	(1/2$^-$)		715.76 *17*	15/2$^-$	1852.6 *4*	29/2$^+$
85.37 *10*	7/2$^+$	14 ns *4*	763.20 *20*	19/2$^+$	2099.7 *7*	27/2$^-$
89.74+x *20*	(5/2$^-$)		867.23 *22*	21/2$^+$	2213.4+x *6*	(29/2$^-$)
95.23 *9*	7/2$^-$		896.7+x *3*	(17/2$^-$)	2320.8 *4*	31/2$^+$
127.91 *13*	9/2$^+$		918.19 *19*	17/2$^-$	2462.2 *4*	33/2$^+$
200.04 *14*	11/2$^+$		1134.7 *4*	19/2$^-$	2643.0 *8*	31/2$^-$
216.85 *10*	9/2$^-$		1203.6 *3*	23/2$^+$	2719.3+x *8*	(33/2$^-$)
273.84 *16*	13/2$^+$		1292.5+x *3*	(21/2$^-$)	2972.1 *5*	35/2$^+$
280.71+x *22*	(9/2$^-$)		1316.3 *3*	25/2$^+$	3130.5 *5*	37/2$^+$
362.26 *15*	11/2$^-$		1362.4 *5*	21/2$^-$	3271.5+x *8*	(37/2$^-$)
423.95 *16*	15/2$^+$		1600.5 *4*	23/2$^-$	3675.1 *7*	39/2$^+$
517.87 *19*	17/2$^+$		1727.6 *3*	27/2$^+$	3834.5 *6*	41/2$^+$
529.34 *15*	13/2$^-$		1734.6+x *4*	(25/2$^-$)	3887.9+x *9*	(41/2$^-$)

[†] From γ-ray multipolarities, coincidence data, and analysis of rotational structure. Authors assigned bandhead configurations on the basis of the similarity of ^{173}W bands to known structure in ^{175}W. A single-quasiparticle Coriolis mixing calculation reproduces ^{173}W structure up to very high spin. See ^{173}W Adopted Levels for band structure and evaluator's assignments.

[‡] $\gamma\gamma$(t).

$\gamma(^{173}W)$

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	δ[‡]	Comments
42.49 *10*	12 *4*	127.91	9/2$^+$	85.37	7/2$^+$			E$_\gamma$,I$_\gamma$: overlap with Dy x rays affects measurements.
72.11 *10*	9 *2*	200.04	11/2$^+$	127.91	9/2$^+$	(M1+E2)		
73.83 *10*	10 *2*	273.84	13/2$^+$	200.04	11/2$^+$			
85.37 *10*	100	85.37	7/2$^+$	0.0	5/2$^-$	E1		Mult.: transition intensity establishes α<3, consistent only with E1.
89.74 *20*	5 *1*	89.74+x	(5/2$^-$)	0.0+x	(1/2$^-$)			
93.93 *10*	8 *1*	517.87	17/2$^+$	423.95	15/2$^+$			
95.22 *10*	10 *1*	95.23	7/2$^-$	0.0	5/2$^-$			
104.07 *15*	3 *1*	867.23	21/2$^+$	763.20	19/2$^+$			
114.78 *15*	2 *1*	200.04	11/2$^+$	85.37	7/2$^+$			
121.60 *10*	11 *3*	216.85	9/2$^-$	95.23	7/2$^-$	M1+E2	−0.30 *15*	
145.40 *25*	20 *2*	362.26	11/2$^-$	216.85	9/2$^-$			I$_\gamma$: for 145.4γ and 145.5γ combined.
145.48 *40*	20 *2*	273.84	13/2$^+$	127.91	9/2$^+$			I$_\gamma$: see comment with 145.4γ.
150.12 *10*	24 *2*	423.95	15/2$^+$	273.84	13/2$^+$	M1+E2	−0.8 *4*	
167.08 *15*	19 *2*	529.34	13/2$^-$	362.26	11/2$^-$	M1+E2	−0.09 *10*	
186.38 *15*	13 *2*	715.76	15/2$^-$	529.34	13/2$^-$	M1+E2	+0.02 *6*	
190.97 *10*	23 *3*	280.71+x	(9/2$^-$)	89.74+x	(5/2$^-$)	E2		
202.40 *15*	7 *2*	918.19	17/2$^-$	715.76	15/2$^-$	M1+E2	−2.0 *20*	
216.87 *15*	12 *3*	216.85	9/2$^-$	0.0	5/2$^-$			I$_\gamma$: includes component from contaminant.

Continued on next page (footnotes at end of table)

^{161}Dy(^{16}O,4nγ) 1978Wa16 (continued)

$\gamma(^{173}W)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
223.91 *10*	30 *2*	423.95	$15/2^+$	200.04	$11/2^+$	E2		
243.69 *40*	22 *8*	517.87	$17/2^+$	273.84	$13/2^+$			I_γ: includes component from ^{174}W.
245.30 *25*	13 *3*	763.20	$19/2^+$	517.87	$17/2^+$	M1+E2	−0.8 *4*	
267.07 *20*	11 *3*	362.26	$11/2^-$	95.23	$7/2^-$	E2		
274.75 *10*	30 *3*	555.46+x	$(13/2^-)$	280.71+x	$(9/2^-)$	E2		
312.48 *15*	15 *2*	529.34	$13/2^-$	216.85	$9/2^-$	E2		
336.43 *20*	10 *3*	1203.6	$23/2^+$	867.23	$21/2^+$	M1+E2	−1.0 *10*	
339.29 *15*	34 *2*	763.20	$19/2^+$	423.95	$15/2^+$	E2		
341.28 *15*	36 *2*	896.7+x	$(17/2^-)$	555.46+x	$(13/2^-)$	E2		
349.31 *20*	55 *11*	867.23	$21/2^+$	517.87	$17/2^+$			I_γ: includes components from ^{172}W and ^{174}W.
353.51 *15*	15 *3*	715.76	$15/2^-$	362.26	$11/2^-$	E2		
388.88 *15*	20 *3*	918.19	$17/2^-$	529.34	$13/2^-$	E2		
395.80 *15*	32 *3*	1292.5+x	$(21/2^-)$	896.7+x	$(17/2^-)$	E2		
418.90 *35*	23 *5*	1134.7	$19/2^-$	715.76	$15/2^-$			I_γ: includes component from ^{172}W.
440.36 *25*	38 *3*	1203.6	$23/2^+$	763.20	$19/2^+$	(E2)		I_γ: includes component from ^{23}Na; $\gamma(\theta)$ also affected by peak from ^{23}Na.
442.06 *30*	27 *3*	1734.6+x	$(25/2^-)$	1292.5+x	$(21/2^-)$	E2		
444.20 *45*	19 *3*	1362.4	$21/2^-$	918.19	$17/2^-$	E2		
449.08 *20*	52 *2*	1316.3	$25/2^+$	867.23	$21/2^+$	E2		
465.80 *20*	19 *3*	1600.5	$23/2^-$	1134.7	$19/2^-$	E2		
478.77 *40*	22 *4*	2213.4+x	$(29/2^-)$	1734.6+x	$(25/2^-)$	E2		
481.10 *60*	15 *4*	1843.5	$25/2^-$	1362.4	$21/2^-$	E2		
499.19 *50*	9 *3*	2099.7	$27/2^-$	1600.5	$23/2^-$			I_γ: includes component from ^{174}W.
505.96 *50*	15 *4*	2719.3+x	$(33/2^-)$	2213.4+x	$(29/2^-)$			I_γ: includes possible component of $\gamma^\pm$ radiation (peaks only partially resolved).
523.94 *20*	37 *4*	1727.6	$27/2^+$	1203.6	$23/2^+$	E2		
536.25 *20*	37 *2*	1852.6	$29/2^+$	1316.3	$25/2^+$	E2		
543.30 *35*	6 *2*	2643.0	$31/2^-$	2099.7	$27/2^-$			
552.13 *25*	13 *3*	3271.5+x	$(37/2^-)$	2719.3+x	$(33/2^-)$			I_γ: includes component from ^{174}W.
593.24 *30*	10 *3*	2320.8	$31/2^+$	1727.6	$27/2^+$			
609.67 *20*	26 *4*	2462.2	$33/2^+$	1852.6	$29/2^+$	E2		
616.40 *32*	9 *3*	3887.9+x	$(41/2^-)$	3271.5+x	$(37/2^-)$	E2		
651.32 *30*	11 *2*	2972.1	$35/2^+$	2320.8	$31/2^+$	E2		
668.31 *25*	24 *4*	3130.5	$37/2^+$	2462.2	$33/2^+$	E2		
703.00 *40*	13 *4*	3675.1	$39/2^+$	2972.1	$35/2^+$	(E2)		I_γ: combined value for 703.0γ and 704.0γ.
703.97 *30*	13 *4*	3834.5	$41/2^+$	3130.5	$37/2^+$	(E2)		I_γ: see comment with 703.0γ.

[†] Arbitrary units relative to Iγ(85.4γ)=100.

[‡] Inferred from γ-ray angular distributions, except where noted; dipole transitions are assumed to be M1, and quadrupole, to be E2.

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Level Scheme

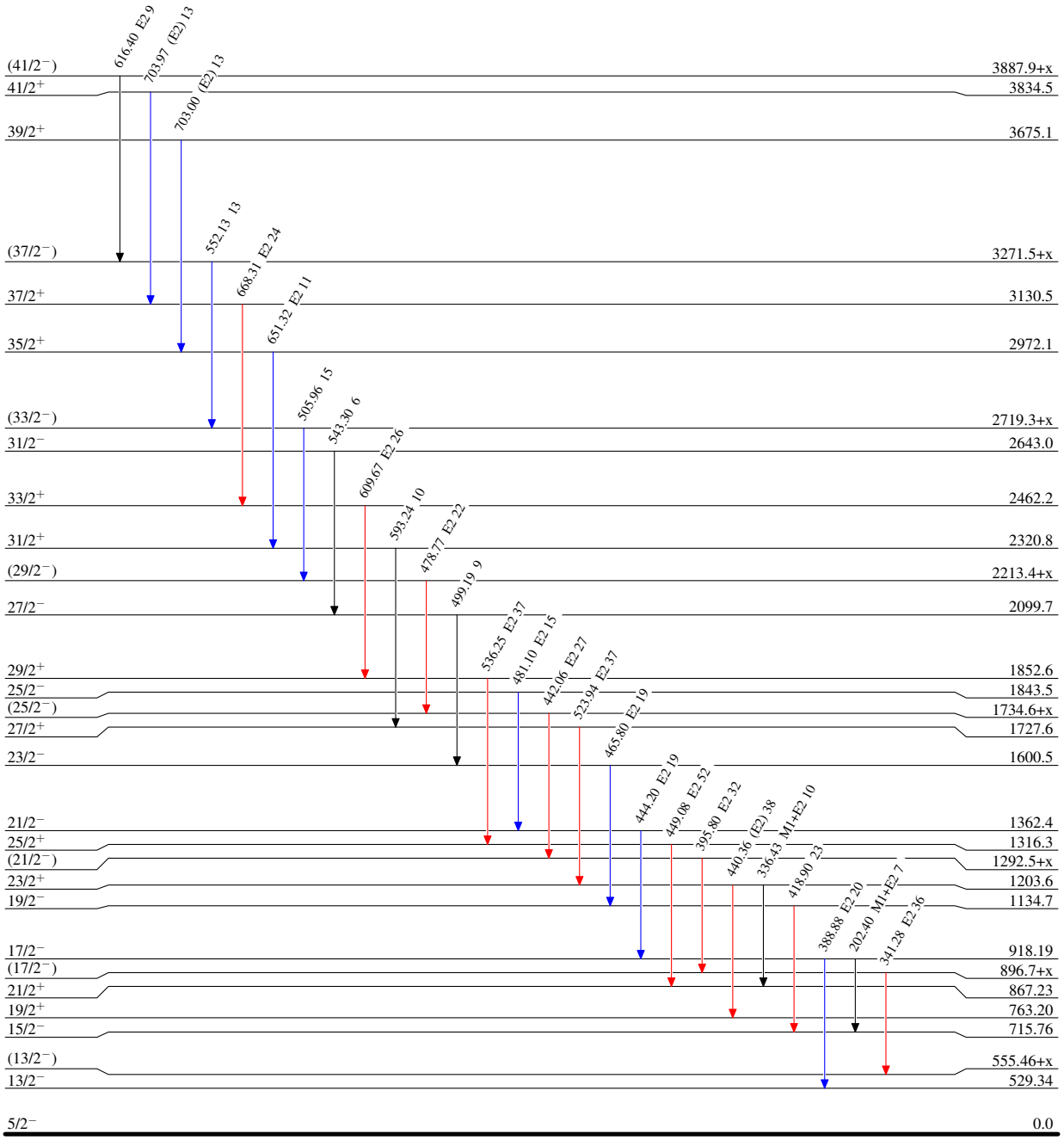
Intensities: Relative I_γ

Legend

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

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

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



$^{173}_{74}W_{99}$

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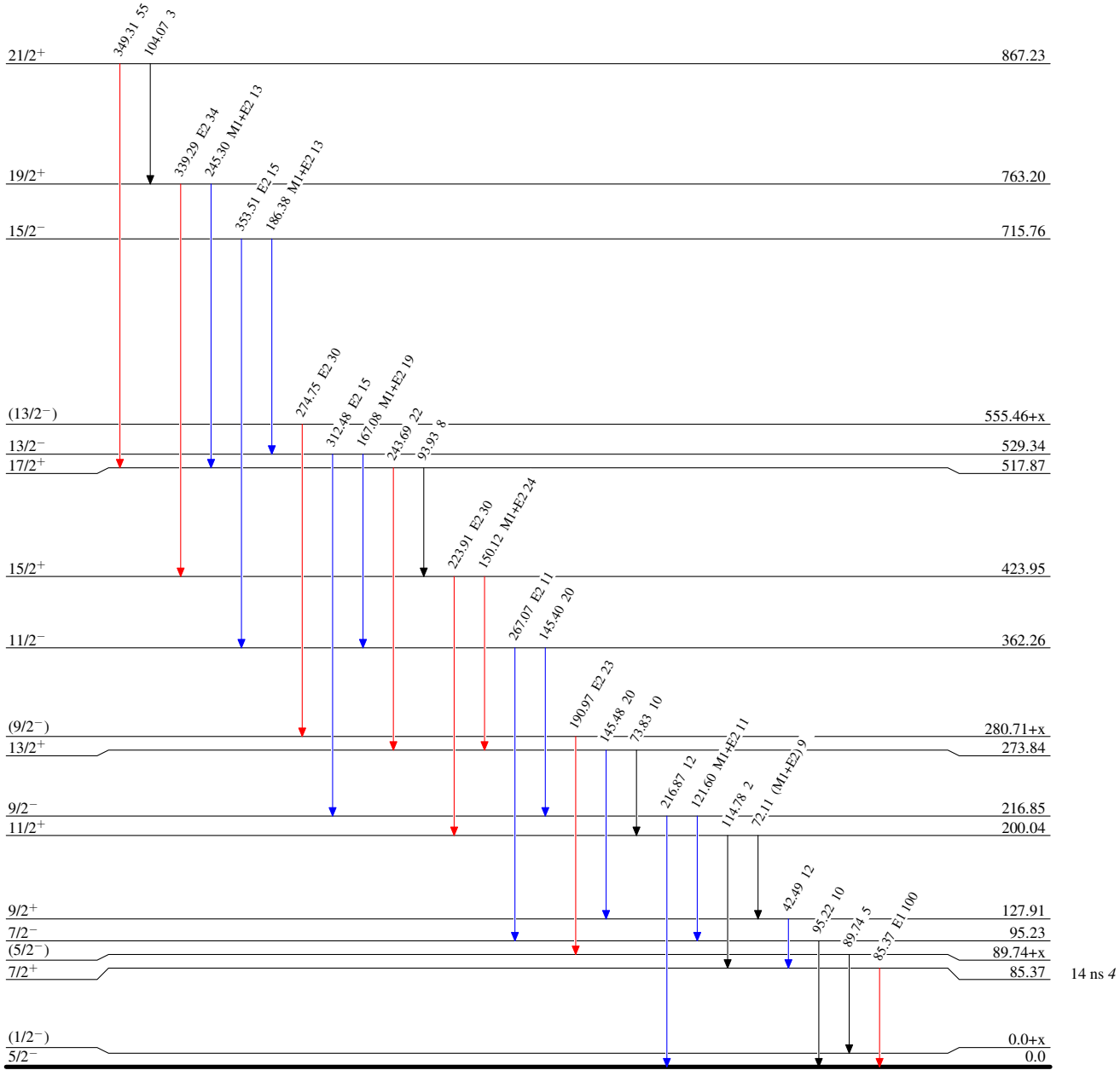
Level Scheme (continued)

Intensities: Relative I_γ

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



$^{173}_{74}W_{99}$