

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. Rodionov and G. Shulyak		NDS 136, 163 (2016)	14-Jul-2016

$Q(\beta^-) = -11317.9$; $S(n) = 12384.9$; $S(p) = 3.54 \times 10^3$; 10 ; $Q(\alpha) = 1980.29$ [2012Wa38](#)

Produced and identified by [1981AIZO](#) and [1981AI23](#); tungsten target bombarded with 1 GeV protons.

The level scheme of ^{146}Dy is constructed on the basis of ε decay data, $\gamma\gamma$ coincidences, $\gamma(t)$, delayed proton measurements and the reactions data.

 ^{146}Dy LevelsCross Reference (XREF) Flags

- A** ^{146}Ho ε decay (3.32 s)
B ^{146}Dy IT decay (150 ms)
C (HI,xn γ)
D ^{147}Er εp decay

E(level) [†]	J π [‡]	T _{1/2}	XREF	Comments
0.0	0 ⁺	33.2 s 7	ABCD	$\% \varepsilon + \% \beta^+ = 100$ T _{1/2} : from I γ (t) (1993AI03). Other: 29 s 3 (1982No08).
682.62 18	2 ⁺		ABCD	
1607.75 21	4 ⁺		ABCD	
1782.8 3	3 ⁻		ABC	
2281.24 23	5 ⁻		ABC	
2458.3 4	(5,6 ⁺)		C	
2518.1 4	7 ⁻		ABC	
2634.9 4	6 ⁺		A C	
2805.1 6	(6,7)		C	
2807.3 4	7 ⁻		ABC	
2807.4 6	(4,5) ⁻		C	
2934.5 4	10 ⁺	150 ms 20	ABC	$\% \text{IT} = 100$ J π : 10 ⁺ state is the only possible seniority-two configuration for the T _{1/2} =150 ms half-life (1982Gu07). T _{1/2} : from I γ (t) (1982Gu07).
2986.0 4	(8) ⁺		A C	
3091.6 5	(7,9) ⁻		C	
3160.0 4	8 ⁻		A C	
3299.9 6	(7,8 ⁺)		C	
3336.2 5	(7,8 ⁺)		C	
3338.5 5	(8,9) ⁻		C	
3438.7 4	9 ⁻		C	
3630.4 4	11 ⁺		C	
3691.8 7	(9,11) ⁻		C	
3769.3 6	9 ⁻		C	
3898.6 4	10 ⁻		C	
4026.5 4	12 ⁺		C	
4194.4 5	11 ⁻		C	
4262.9 4	(11) ⁻		C	
4472.6 4	(12) ⁻		C	
4848.0 5	(13) ⁻		C	
4848.9 5	13 ⁺		C	
5011.5 4	(14) ⁻		C	
5065.1 5	(13) ⁻		C	
5153.7 5	14 ⁺		C	
5259.4 6	13 ⁺		C	

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Adopted Levels, Gammas (continued) ^{146}Dy Levels (continued)

E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF
5268.9 5	(14 ⁻)	C	6046.0 5	15 ⁺	C	7035.9 6	(19 ⁻)	C
5327.9 6	(14 ⁻)	C	6092.5 5	16 ⁺	C	7188.3 6	19 ⁺	C
5331.6 4	(15 ⁻)	C	6114.6 5	(16 ⁻)	C	7261.3 6	(19 ⁺)	C
5376.9 5	14 ⁺	C	6184.1 5	(16)	C	7267.1 5	(18 ⁻)	C
5417.8 4	(15 ⁻)	C	6258.6 5	(17 ⁻)	C	7278.9 6	(18 ⁻)	C
5550.7 5	(15 ⁻)	C	6324.1 5	(17 ⁻)	C	7424.1 6	(19 ⁻)	C
5731.7 7	(15 ⁻)	C	6370.0 7	(17 ⁻)	C	7445.1 7	(19 ⁻)	C
5741.5 5	(16 ⁻)	C	6466.4 8	(18 ⁻)	C	7501.2 6	(19 ⁻)	C
5808.4 8	(15,16)	C	6563.1 5	17 ⁺	C	7740.9 6	(20 ⁻)	C
5858.1 10	(14 ⁺)	C	6576.4 6	(18 ⁻)	C	7790.6 7	(20 ⁻)	C
5919.8 6		C	6717.7 6	(17 ⁻)	C	7942.8 7	(21 ⁻)	C
5931.8 5	(16 ⁻)	C	6723.1 6	(18 ⁻)	C	8058.1 7	(21 ⁻)	C
5981.3 5	15 ⁺	C	6892.8 6	18 ⁺	C	8508.9 8	(22 ⁻)	C
5983.6 8	(16)	C	6923.6 5	18 ⁺	C	8886.4 9	(23 ⁻)	C

[†] From a least-squares fit to E_γ data, normalized $\chi^2=0.65$. Where uncertainty is not known it is assumed to be 1 keV.

[‡] From $\alpha(\text{exp})$, $\gamma(\theta)(\text{DCO})$ data, shell model calculations and systematics for N=80 even-even nuclei.

 $\gamma(^{146}\text{Dy})$

E _i (level)	J ^π _i	E _γ [†]	I _γ [†]	E _f	J ^π _f	Mult. [@]	α^a	Comments
682.62	2 ⁺	682.62 [‡] 18	100	0.0	0 ⁺	E2	0.00704	
1607.75	4 ⁺	925.12 [‡] 10	100	682.62	2 ⁺	E2	0.00358	
1782.8	3 ⁻	1100.25 [‡] 25	100	682.62	2 ⁺	(E1)	1.05×10 ⁻³	
2281.24	5 ⁻	498.6 [‡] 5	10.5 18	1782.8	3 ⁻	E2	0.01526	
		673.5 [‡] 1	100 16	1607.75	4 ⁺	(E1)	0.00271	
2458.3	(5,6 ⁺)	850.5 3	100	1607.75	4 ⁺			
2518.1	7 ⁻	236.95 [‡] 25	100	2281.24	5 ⁻	E2	0.1355	
2634.9	6 ⁺	1027.0 3	100	1607.75	4 ⁺	E2	0.00288	
2805.1	(6,7)	346.8 4	100	2458.3	(5,6 ⁺)			
2807.3	7 ⁻	289.2 [‡] 3	100	2518.1	7 ⁻	M1,E2	0.10 3	
2807.4	(4,5) ⁻	1199.6 5	100	1607.75	4 ⁺	(E1)	9.19×10 ⁻⁴	
2934.5	10 ⁺	127.0 [#] 3	5 [#] 5	2807.3	7 ⁻	E3	13.34 25	B(E3)(W.u.)=0.3 +4-3
		416.5 [#] 3	100 [#] 30	2518.1	7 ⁻	E3	0.0799	B(E3)(W.u.)=0.0016 9
2986.0	(8) ⁺	178.8 3	59 11	2807.3	7 ⁻	(E1)	0.0653	
		350.94 [‡] 21	100 13	2634.9	6 ⁺			
3091.6	(7,9 ⁻)	573.5 4	100	2518.1	7 ⁻	&		
3160.0	8 ⁻	352.52 20	69 15	2807.3	7 ⁻			
		642.0 2	100 23	2518.1	7 ⁻	M1	0.01578	
3299.9	(7,8 ⁺)	665.0 4	100	2634.9	6 ⁺			
3336.2	(7,8 ⁺)	701.3 3	100	2634.9	6 ⁺			
3338.5	(8,9) ⁻	531.6 4	100	2807.3	7 ⁻			
3438.7	9 ⁻	100.5 3	18 9	3338.5	(8,9) ⁻			
		278.6 2	100 18	3160.0	8 ⁻	M1	0.1377	
3630.4	11 ⁺	695.9 1	100	2934.5	10 ⁺	M1	0.01291	
3691.8	(9,11 ⁻)	600.2 4	100	3091.6	(7,9 ⁻)	&		
3769.3	9 ⁻	1251.2 5	100	2518.1	7 ⁻	E2	0.00195	
3898.6	10 ⁻	738.6 2	100	3160.0	8 ⁻	E2	0.00587	
4026.5	12 ⁺	395.7 5	21 3	3630.4	11 ⁺	M1	0.0544	

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Adopted Levels, Gammas (continued)

$\gamma(^{146}\text{Dy})$ (continued)							
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [@]	α^a
4026.5	12 ⁺	1092.1 1	100 15	2934.5	10 ⁺	E2	0.00254
4194.4	11 ⁻	755.7 3	100	3438.7	9 ⁻	E2	0.00557
4262.9	(11 ⁻)	236.4 3	8 3	4026.5	12 ⁺		
		632.4 2	16 5	3630.4	11 ⁺	&	
4472.6	(12 ⁻)	1328.5 2	100 15	2934.5	10 ⁺	(E1)	8.33×10 ⁻⁴
		209.8 3	53 9	4262.9 (11 ⁻)	M1		0.298
		446.0 1	100 7	4026.5	12 ⁺	&	
		842.2 2	53 8	3630.4	11 ⁺		
4848.0	(13 ⁻)	375.5 4	69 7	4472.6 (12 ⁻)	M1		0.0623
		821.5 3	100 5	4026.5	12 ⁺		
4848.9	13 ⁺	822.4 3	35 6	4026.5	12 ⁺		
		1218.5 5	100 18	3630.4	11 ⁺	E2	0.00205
5011.5	(14 ⁻)	163.5 3	9.3 23	4848.0 (13 ⁻)	M1		0.594
		538.9 1	100 17	4472.6 (12 ⁻)	E2		0.01250
5065.1	(13 ⁻)	592.5 4	100	4472.6 (12 ⁻)	M1		0.0193
5153.7	14 ⁺	1127.3 3	100	4026.5	12 ⁺	E2	0.00238
5259.4	13 ⁺	1233.5 6	100 30	4026.5	12 ⁺		
		1628.5 6	33 30	3630.4	11 ⁺		
5268.9	(14 ⁻)	203.8 3	64 9	5065.1 (13 ⁻)	M1		0.322
		257.5 2	73 9	5011.5 (14 ⁻)			
		420.9 3	100 18	4848.0 (13 ⁻)	M1		0.0463
5327.9	(14 ⁻)	316.4 4	100	5011.5 (14 ⁻)			
5331.6	(15 ⁻)	320.1 1	100 16	5011.5 (14 ⁻)	M1		0.0950
		483.5 4	23 3	4848.0 (13 ⁻)	E2		0.01655
5376.9	14 ⁺	117.5 5	57 14	5259.4 13 ⁺	M1		1.51 3
		223.2 5	29 14	5153.7 14 ⁺			
		1350.3 3	100 14	4026.5	12 ⁺	E2	1.70×10 ⁻³
5417.8	(15 ⁻)	149.1 3	54 8	5268.9 (14 ⁻)	M1		0.769
		406.3 1	100 15	5011.5 (14 ⁻)	M1		0.0507
5550.7	(15 ⁻)	173.8 2	100 20	5376.9 14 ⁺			
		397.5 5	28 9	5153.7 14 ⁺			
5731.7	(15 ⁻)	403.8 4	100	5327.9 (14 ⁻)	M1		0.0516
5741.5	(16 ⁻)	323.7 1	100 14	5417.8 (15 ⁻)	M1		0.0922
		409.8 2	93 14	5331.6 (15 ⁻)	M1		0.0496
		730.5 4	36 7	5011.5 (14 ⁻)			
5808.4	(15,16)	539.5 6	100	5268.9 (14 ⁻)			
5858.1	(14 ⁺)	1831.6 9	100	4026.5	12 ⁺		
5919.8		178.3 3	100	5741.5 (16 ⁻)			
5931.8	(16 ⁻)	514.1 2	100	5417.8 (15 ⁻)	M1		0.0277
5981.3	15 ⁺	712.3 3	100 17	5268.9 (14 ⁻)	(E1)		0.00242
		1132.5 4	50 17	4848.9 13 ⁺	E2		0.00236
5983.6	(16)	251.9 3	100	5731.7 (15 ⁻)			
6046.0	15 ⁺	1196.9 4	100	4848.9 13 ⁺	E2		0.00212
6092.5	16 ⁺	760.3 3	100 18	5331.6 (15 ⁻)			
		938.7 2	82 12	5153.7 14 ⁺	E2		0.00347
6114.6	(16 ⁻)	68.6 3	63 13	6046.0 15 ⁺			
		133.3 4	75 13	5981.3 15 ⁺			
		783.1 4	100 13	5331.6 (15 ⁻)	M1		0.00964
6184.1	(16)	252.6 3	100 30	5931.8 (16 ⁻)			
		633.4 3	91 30	5550.7 (15 ⁻)			
6258.6	(17 ⁻)	517.1 2	100	5741.5 (16 ⁻)	M1		0.0273
6324.1	(17 ⁻)	209.5 3	71 12	6114.6 (16 ⁻)	M1		0.299
		231.6 2	100 18	6092.5 16 ⁺			
6370.0	(17 ⁻)	438.2 5	100	5931.8 (16 ⁻)	M1		0.0417
6466.4	(18 ⁻)	534.6 6	100	5931.8 (16 ⁻)	E2		0.01276

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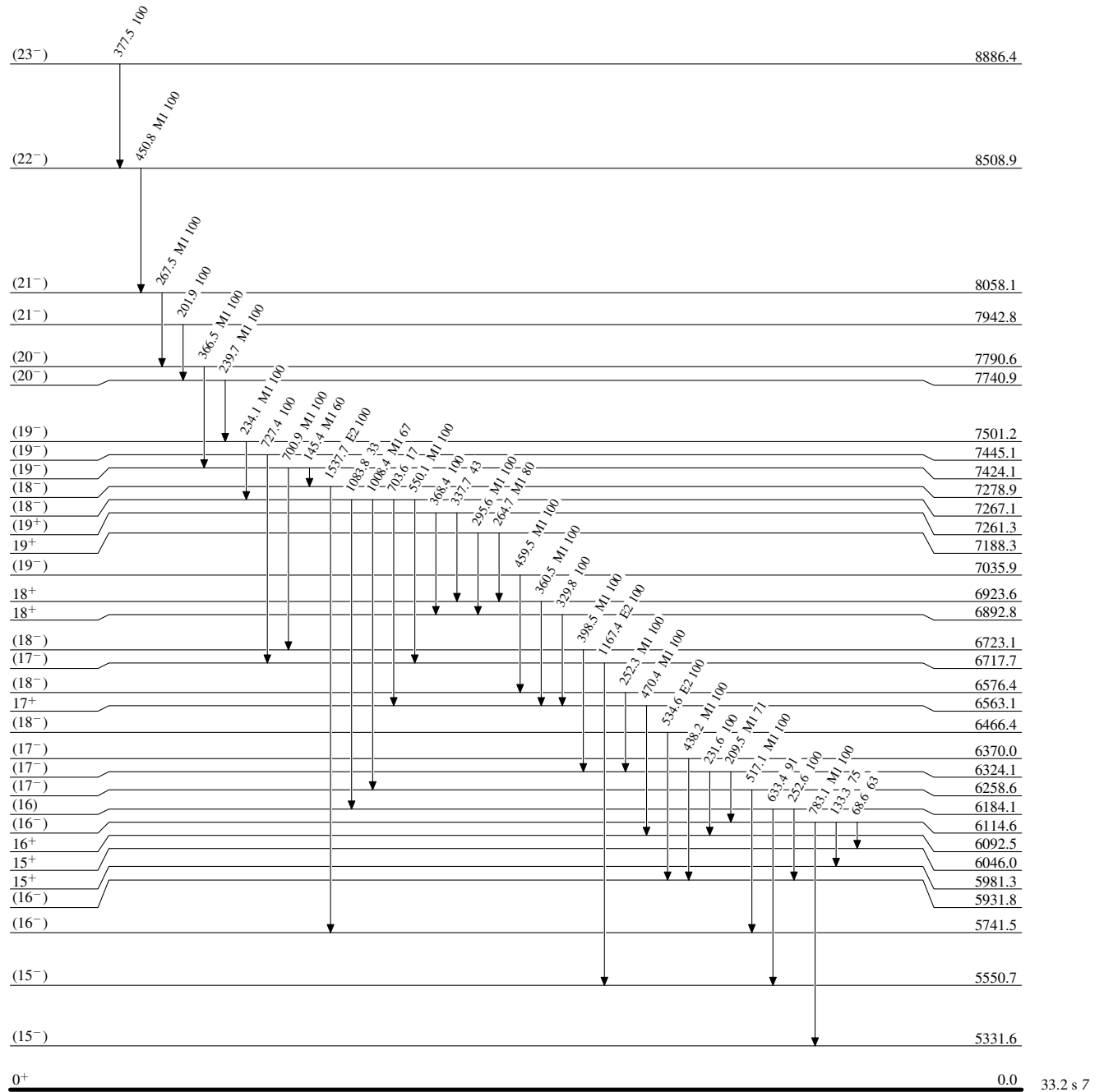
Adopted Levels, Gammas (continued) $\gamma(^{146}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. @	α^a
6563.1	17 ⁺	470.4 2	100	6092.5	16 ⁺	M1	0.0347
6576.4	(18 ⁻)	252.3 3	100	6324.1	(17 ⁻)	M1	0.180
6717.7	(17 ⁻)	1167.4 4	100	5550.7	(15 ⁻)	E2	0.00222
6723.1	(18 ⁻)	398.5 5	100	6324.1	(17 ⁻)	M1	0.0534
6892.8	18 ⁺	329.8 3	100	6563.1	17 ⁺		
6923.6	18 ⁺	360.5 2	100	6563.1	17 ⁺	M1	0.0694
7035.9	(19 ⁻)	459.5 2	100	6576.4	(18 ⁻)	M1	0.0369
7188.3	19 ⁺	264.7 2	80 20	6923.6	18 ⁺	M1	0.1580
		295.6 3	100 20	6892.8	18 ⁺	M1	0.1175
7261.3	(19 ⁺)	337.7 3	43 21	6923.6	18 ⁺		
		368.4 3	100 21	6892.8	18 ⁺		
7267.1	(18 ⁻)	550.1 5	100 17	6717.7	(17 ⁻)	M1	0.0233
		703.6 3	17 17	6563.1	17 ⁺		
		1008.4 5	67 17	6258.6	(17 ⁻)	M1	0.00520
		1083.8 5	33 17	6184.1	(16)		
7278.9	(18 ⁻)	1537.7 4	100	5741.5	(16 ⁻)	E2	1.39×10 ⁻³
7424.1	(19 ⁻)	145.4 3	60 12	7278.9	(18 ⁻)	M1	0.826
		700.9 2	100 18	6723.1	(18 ⁻)	M1	0.01268
7445.1	(19 ⁻)	727.4 4	100	6717.7	(17 ⁻)		
7501.2	(19 ⁻)	234.1 2	100	7267.1	(18 ⁻)	M1	0.220
7740.9	(20 ⁻)	239.7 3	100	7501.2	(19 ⁻)	M1	0.207
7790.6	(20 ⁻)	366.5 3	100	7424.1	(19 ⁻)	M1	0.0664
7942.8	(21 ⁻)	201.9 2	100	7740.9	(20 ⁻)		
8058.1	(21 ⁻)	267.5 2	100	7790.6	(20 ⁻)	M1	0.1536
8508.9	(22 ⁻)	450.8 4	100	8058.1	(21 ⁻)	M1	0.0388
8886.4	(23 ⁻)	377.5 4	100	8508.9	(22 ⁻)		

[†] From (HI,xn γ) data except as noted.[‡] Weighted average of ^{146}Ho ε decay and (HI,xn γ) data.# From ^{146}Ho ε decay data.@ From $\alpha(\text{exp})$, $\gamma(\theta)(\text{DCO})$ data.& $\Delta J=0$ or 2 from DCO ratio >1 (not crossover transition) (2001Ro15).^a Additional information 1.

Adopted Levels, GammasLevel Scheme

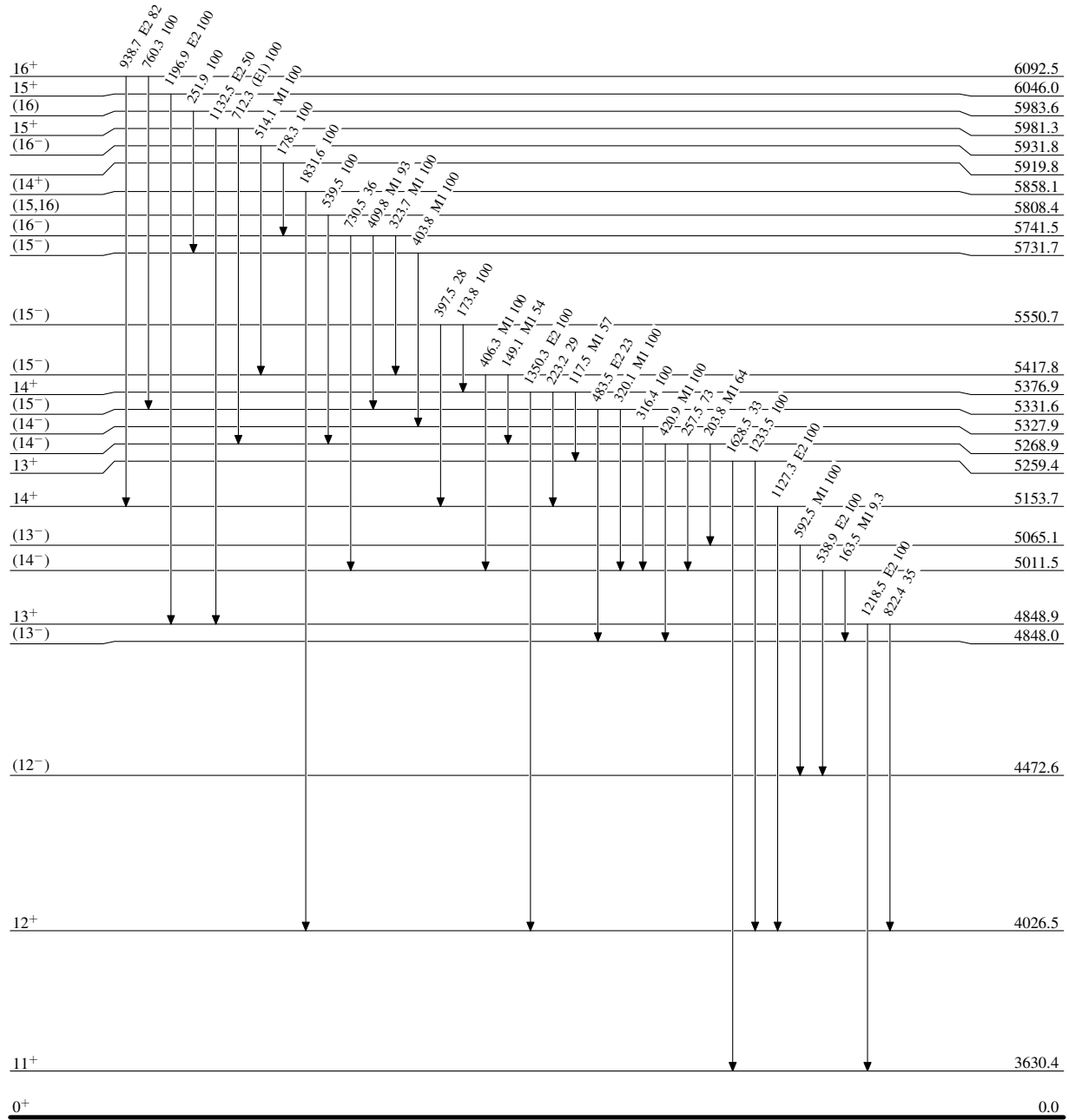
Intensities: Relative photon branching from each level



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Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level



Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level

