

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109,1103 (2008)	1-Mar-2008

$Q(\beta^-) = -9.99 \times 10^3$ 8; $S(n) = 1.110 \times 10^4$ 3; $S(p) = 3330$ 17; $Q(\alpha) = 4856$ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record $-10.04\text{E}3$ SY11101 27 3326 20 4856 4 [2003Au03](#).

$\Delta Q(\beta^-) = 90$ ([2003Au03](#)).

Assignment: $^{156}\text{Dy}(^{16}\text{O}, 6n)$, $E(^{16}\text{O}) = 124.6$ MeV excit ([1975To05](#)).

 ^{166}W LevelsCross Reference (XREF) Flags

- A $^{142}\text{Nd}(^{28}\text{Si}, 4n\gamma)$
 B $^{106}\text{Pd}(^{63}\text{Cu}, p2n\gamma)$
 C ^{170}Os α decay
 D ^{166}Re ε decay

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
0.0@	0 ⁺ #	19.2 s 6	ABCD	$\% \alpha = 0.035$ 12; $\% \varepsilon + \% \beta^+ = 99.965$ 12 $\% \alpha$: 0.035 12 is the 0.03 1 datum of 1989Hi04 after adjustment by the evaluator assuming adopted $\alpha(^{126}\gamma, ^{166}\text{Ta}) = 1.98$ 24 (the authors used $\alpha = 2.51 + 10 - 17$). Others: 0.6 2 (1981HoZM , 1979Ho10 ; from $I\alpha(\text{from } ^{166}\text{W})/I\alpha(\text{from } ^{162}\text{Hf})$); this implies $r_0(^{162}\text{Hf})$ much larger than expected from r_0 systematics (which suggest $\% \alpha \approx 0.075$ (1998Ak04)). $\% \alpha < 30$ (1984ScZQ). J ^π : g.s. of even-even nucleus. T _{1/2} : weighted average of 22.0 s 10 (1992HeZV), 18.8 s 4 (1989Hi04 , from ^{166}W ε decay), 19.6 s 12 (1989Hi04 , from ^{166}W α decay), 16 s 3 (1975To05 and 1984ScZQ , from ^{166}W α decay). J ^π : E2 252 γ to 0 ⁺ g.s.
252.0@ 3	2 ⁺ #		AB D	
675.7@ 4	4 ⁺ #		AB D	
1225.9@ 4	6 ⁺ #		AB D	
1587.3& 6	(5 ⁻)		AB	
1864.8@ 5	8 ⁺ #		AB	
1928.5& 6	(7 ⁻)		AB	
2020.2 ^a 10	(6 ⁻)		B	
2337.3& 7	(9 ⁻)		AB	XREF: A(2333.4).
2349.5 ^a 9	(8 ⁻)		B	
2551.6@ 5	10 ⁺ #		AB	
2573.2 ^a 10	(10 ⁻)		B	
2742.5& 9	(11 ⁻)		AB	
2946.6 ^a 14	(12 ⁻)		B	
3031.2@ 6	(12 ⁺)#		AB	
3173.0& 10	(13 ⁻)		AB	
3356.2@ 6	(14 ⁺)#		AB	
3474.3 ^a 18	(14 ⁻)		B	
3722.1& 11	(15 ⁻)		AB	
3821.3@ 8	(16 ⁺)#		AB	
4127.0 ^a 20	(16 ⁻)		B	
4378.1& 12	(17 ⁻)		AB	

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Adopted Levels, Gammas (continued) ^{166}W Levels (continued)

E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF
4388.4 [@] 9	(18 ⁺) [#]	AB	6169 ^a 3	(22 ⁻)	B	7917.0? ^{&} 24	(27 ⁻)	B
4870.7 ^a 23	(18 ⁻)	B	6492.4 [@] 13	(24 ⁺) [#]	AB	8184.3 [@] 17	(28 ⁺) [#]	B
5027.3 [@] 11	(20 ⁺) [#]	AB	6496.3 ^{&} 20	(23 ⁻)	B	8290? ^a 4	(28 ⁻)	B
5114.3 ^{&} 13	(19 ⁻)	AB	6811? ^a 3	(24 ⁻)	B	8725? ^{&} 3	(29 ⁻)	B
5579.5 ^a 25	(20 ⁻)	B	7170.5? ^{&} 22	(25 ⁻)	B	9106.9 [@] 20	(30 ⁺) [#]	B
5729.1 [@] 12	(22 ⁺) [#]	AB	7312.7 [@] 14	(26 ⁺) [#]	AB	10075.7? [@] 22	(32 ⁺) [#]	B
5853.6 ^{&} 17	(21 ⁻)	B	7520? ^a 3	(26 ⁻)	B			

[†] From least-squares adjustment of E_γ , assigning $\Delta E_\gamma=1$ keV to E_γ values to which the authors did not assign an uncertainty.

[‡] Based on measured transition multiplicities and band structure deduced in (HI,xn γ) studies, supported by cranked shell model calculations of 1992Si12 and systematics of band properties in neighboring nuclides.

[#] A cascade of stretched Q intraband transitions exists between the J=18 and the J=0 band members; the 0⁺ g.s. is the band head, and an E2 353 γ links the J=2 and 0 members. Definite J^π values have, therefore, been assigned below the first band crossing (i.e., to J=0 through 10 band members).

[@] Band(A): $K^\pi=0^+$ yrast band (1992Si12). Becomes (ν 3/2[651])² band at $\hbar\omega=262$ 4 keV.

[&] Band(B): (ν 3/2[651])(ν 3/2[521]), $\alpha=+1/2$ band (1992Si12). Crossed by 4 quasineutron (3/2[651])²(3/2[521])(1/2[660]) band at $\hbar\omega=348$ keV 4. (AE band crossed by AEBC band). Stretched dipole interband transitions link this band to the 0⁺ g.s. band. Many of the intraband cascade transitions are stretched Q. $\pi=-$ consistent with systematics of the odd-parity sidebands in heavier W nuclei.

^a Band(C): (ν 3/2[651])(ν 3/2[521]), $\alpha=-1/2$ band (1992Si12). Crossed by 4 quasineutron (3/2[651])²(3/2[521])(1/2[660]) band at $\hbar\omega=336$ keV 4. (AF band crossed by AFBC band).

 $\gamma(^{166}\text{W})$

$E_i(\text{level})$	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult. [#]	α^a	Comments
252.0	2 ⁺	252.0 3	100	0.0	0 ⁺	E2 ^{&}	0.1452	Weighted average of 251.7 2 in ($^{28}\text{Si},4n\gamma$) and 252.3 2 in ε decay. Mult.: Q from $\gamma(\theta)$, not M2 from intensity balance in ($^{28}\text{Si},4n\gamma$).
675.7	4 ⁺	423.7 2	100	252.0	2 ⁺	(E2) ^{&}	0.0321	Other E_γ : 423.9 2 in ε decay.
1225.9	6 ⁺	550.2 2	100	675.7	4 ⁺	(E2) ^{&}	0.01661	
1587.3	(5 ⁻)	911.5 5	100	675.7	4 ⁺	D		
1864.8	8 ⁺	638.9 ^b 2	100	1225.9	6 ⁺	(E2)	0.01171	Mult.: stretched Q, based on DCO ratios for doublet dominated by this intraband transition. Other I_γ : 39 4 from ($^{28}\text{Si},4n\gamma$).
1928.5	(7 ⁻)	341.0 5	42 3	1587.3	(5 ⁻)	(E2)	0.0584	
		702.7 5	100 8	1225.9	6 ⁺	D		
2020.2	(6 ⁻)	432.8 [@]	100	1587.3	(5 ⁻)			
2337.3	(9 ⁻)	408.8 5	100 5	1928.5	(7 ⁻)	(E2)	0.0353	Placement is from ($^{63}\text{Cu},p2n\gamma$); order of 405 γ and 409 γ was reversed in ($^{28}\text{Si},4n\gamma$).
		472.7 [@]	26.6 22	1864.8	8 ⁺	D		
2349.5	(8 ⁻)	329.3 [@]	100 21	2020.2	(6 ⁻)	(E2)	0.0646	
		421.1 [@]	91 15	1928.5	(7 ⁻)			
2551.6	10 ⁺	686.8 2	100	1864.8	8 ⁺	(E2)	0.00995	
2573.2	(10 ⁻)	223.8 [@]	100 10	2349.5	(8 ⁻)			
		235.7 [@]	74 7	2337.3	(9 ⁻)	D		
2742.5	(11 ⁻)	405.2 5		2337.3	(9 ⁻)	(E2)	0.0362	Other E_γ : 406.2 in ($^{63}\text{Cu},p2n\gamma$).

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Adopted Levels, Gammas (continued)

$\gamma(^{166}\text{W})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]	α^a	Comments
Placement is from ($^{63}\text{Cu}, p2n\gamma$); order of 405 γ and 409 γ was reversed in ($^{28}\text{Si}, 4n\gamma$).								
2946.6	(12 $^-$)	373.4 [@]	100	2573.2	(10 $^-$)	(E2)	0.0452	E_γ : 546.2 in ($^{63}\text{Cu}, p2n\gamma$).
3031.2	(12 $^+$)	479.6 2	100	2551.6	10 $^+$	(E2)	0.0233	
3173.0	(13 $^-$)	430.5 5	100	2742.5	(11 $^-$)	(E2)	0.0308	
3356.2	(14 $^+$)	325.0 2	100	3031.2	(12 $^+$)	(E2)	0.0671	
3474.3	(14 $^-$)	527.7 [@]	100	2946.6	(12 $^-$)	(E2)	0.0184	
3722.1	(15 $^-$)	549.1 5	100	3173.0	(13 $^-$)	(E2)	0.01669	E_γ : 568.0 in ($^{63}\text{Cu}, p2n\gamma$).
3821.3	(16 $^+$)	465.1 5	100	3356.2	(14 $^+$)	(E2)	0.0252	
4127.0	(16 $^-$)	652.7 [@]	100	3474.3	(14 $^-$)	(E2)	0.01115	
4378.1	(17 $^-$)	656.0 5	100	3722.1	(15 $^-$)	(E2)	0.01103	
4388.4	(18 $^+$)	567.1 5	100	3821.3	(16 $^+$)	(E2)	0.01545	
4870.7	(18 $^-$)	743.7 [@]	100	4127.0	(16 $^-$)	(E2)	0.00835	E_γ : 701.1 in ($^{63}\text{Cu}, p2n\gamma$).
5027.3	(20 $^+$)	638.9 ^b 5	100	4388.4	(18 $^+$)			
5114.3	(19 $^-$)	736.2 5	100	4378.1	(17 $^-$)	(E2)	0.00854	
5579.5	(20 $^-$)	708.8 [@]	100	4870.7	(18 $^-$)			
5729.1	(22 $^+$)	701.8 5	100	5027.3	(20 $^+$)	(E2)	0.00948	
5853.6	(21 $^-$)	739.3 [@]	100	5114.3	(19 $^-$)			E_γ : 765.1 in ($^{63}\text{Cu}, p2n\gamma$).
6169	(22 $^-$)	589.7 [@]	100	5579.5	(20 $^-$)	(E2)	0.01409	
6492.4	(24 $^+$)	763.3 5	100	5729.1	(22 $^+$)	(E2)	0.00789	
6496.3	(23 $^-$)	642.6 [@]	100	5853.6	(21 $^-$)			
6811?	(24 $^-$)	641.7 ^{@c}	100	6169	(22 $^-$)			
7170.5?	(25 $^-$)	674.2 ^{@c}	100	6496.3	(23 $^-$)	(E2)	0.01037	
7312.7	(26 $^+$)	820.3 5	100	6492.4	(24 $^+$)	(E2)	0.00677	
7520?	(26 $^-$)	708.8 ^{@c}	100	6811?	(24 $^-$)			
7917.0?	(27 $^-$)	746.5 ^{@c}	100	7170.5?	(25 $^-$)			
8184.3	(28 $^+$)	871.6 [@]	100	7312.7	(26 $^+$)	(E2)	0.00596	
8290?	(28 $^-$)	770.5 ^{@c}	100	7520?	(26 $^-$)			
8725?	(29 $^-$)	808.2 ^{@c}	100	7917.0?	(27 $^-$)			
9106.9	(30 $^+$)	922.6 [@]	100	8184.3	(28 $^+$)			
10075.7?	(32 $^+$)	968.8 ^{@c}	100	9106.9	(30 $^+$)			

[†] From ($^{28}\text{Si}, 4n\gamma$), except as noted.

[‡] Relative-photon intensity, normalized to 100 for the strongest γ deexciting each level; from ($^{63}\text{Cu}, p2n\gamma$), except as noted.

[#] Based on measured DCO ratios in ($^{63}\text{Cu}, p2n\gamma$), assigning $\Delta\pi=(\text{no})$ for intraband transitions, except as noted.

[@] From ($^{63}\text{Cu}, p2n\gamma$); uncertainty unstated by authors.

[&] Transition is member of stretched E2 cascade to 0⁺ g.s.

^a Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^b Multiply placed.

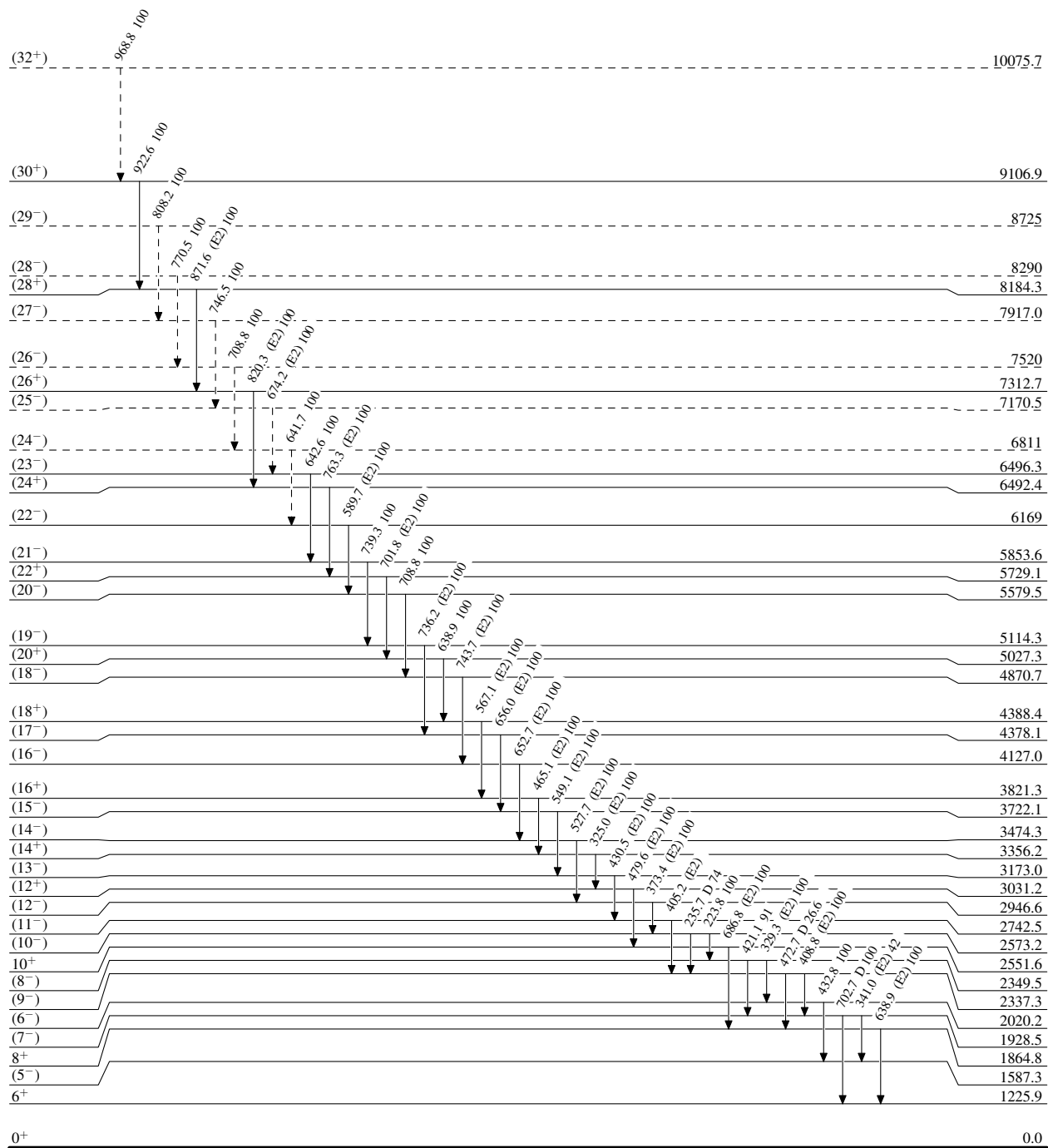
^c Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

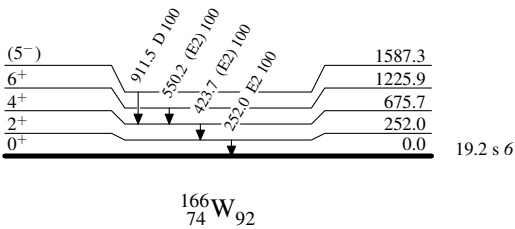
Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

Adopted Levels, Gammas

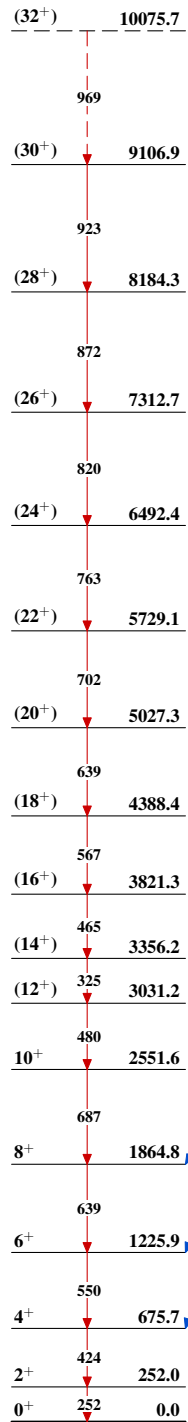
Level Scheme (continued)

Intensities: Relative photon branching from each level

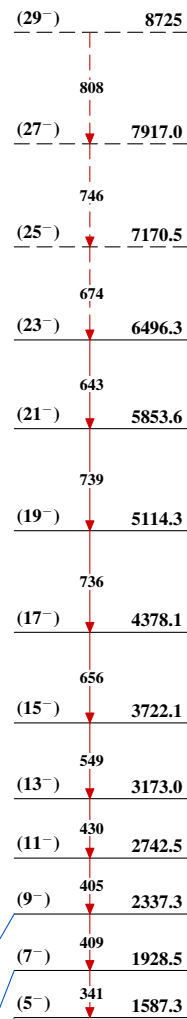


Adopted Levels, Gammas

Band(A): $K^\pi=0^+$ yrast
band (1992Si12)



Band(B): $(\nu 3/2[651])(\nu 3/2[521])$, $\alpha=+1/2$ band
(1992Si12)



Band(C): $(\nu 3/2[651])(\nu 3/2[521])$, $\alpha=-1/2$ band
(1992Si12)

