

^{252}Cf SF decay [1999Bu32](#),[1993Ar05](#),[1986Ma22](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, F. G. Kondev		NDS 124, 157 (2015)	1-Aug-2014

Parent: ^{252}Cf : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=2.645$ y 8; %SF decay=3.092 8

[1999Bu32](#), [1993Ar05](#): Facility: Holifield Heavy Ion (HI) Research Facility, Oak Ridge National Laboratory; Source: 0.1 μg thick ^{252}Cf source of 6 μCi activity, placed behind a 250 μm thick Be window; Detectors: Gammasphere array, 2.5 cm^3 LEPS, 25% n-type Ge, 5 cm x 5 cm liquid scintillator (BC-501); Measured: γ - γ coinc., X-rays, HI- γ -N, E_γ , $\gamma(\theta)$, I_γ ; Deduced: ^{112}Pd level scheme, band structure, J^π .

[1986Ma22](#): Source: ^{252}Cf on 100 $\mu\text{g}/\text{cm}^2$ Ni foil; Detectors: one Ge(Li), stopper consisting of 20 $\mu\text{g}/\text{cm}^2$ C foil, one surface barrier detector; Measured: HI- γ coinc., HI- $\gamma(t)$, E_γ , I_γ ; Deduced: $T_{1/2}$ from RDM.

Others: [2002Ha46](#), [1998JoZX](#), [1998SiZW](#), [1997Ha64](#), [1993Ar05](#), [1990DuZW](#), [1970Ch11](#), [1971Ch44](#).

 ^{112}Pd Levels

E(level) [†]	J^π [‡]	$T_{1/2}$	Comments
0.0 [#]	0 ⁺		
348.8 [#] 3	2 ⁺	84 ps 14	$T_{1/2}$: from recoil-distance measurements in 1986Ma22 ; Other:<0.1 ns (1970Ch11).
736.8 [@] 3	2 ⁺		
883.1 [#] 4	4 ⁺		
1096.2 [@] 4	3 ⁺		
1362.1 [@] 5	(4 ⁺)		
1550.4 [#] 4	6 ⁺		
1715.3 4	(3 ⁻ , 4 ⁺)		
1758.5 [@] 5	(5 ⁺)		
2002.2 [@] 6	(6 ⁺)		
2194.8 4	(4 ⁻)		
2269.5 ^{&} 5	(5 ⁻)		
2318.2 [#] 5	8 ⁺		
2355.1 5			
2482.5 [@] 7	(7 ⁺)		
2578.7 ^a 6	(6 ⁻)		
2690.7 [@] 6	(8 ⁺)		
2704.3 ^{&} 6	(7 ⁻)		
2711.9 ^b 7	(7 ⁻)		
2755.3 4	(4)		J^π : (4 ⁺ , 5 ⁺) in the Adopted Levels.
2898.9 ^a 8	(8 ⁻)		
2966.0 6			
3050.1 [#] 7	10 ⁺		
3084.4 [@] 9	(9 ⁺)		
3137.2 ^{&} 6	(9 ⁻)		
3266.0 ^b 9	(9 ⁻)		
3446.9 ^a 9	(10 ⁻)		
3597.9 [#] 9	(12 ⁺)		
3744.9 ^{&} 8	(11 ⁻)		
4321.9 [#] 10	(14 ⁺)		

[†] From a least-squares fit to E_γ .

[‡] From [1999Bu32](#), based on angular correlation measurements and observed band structure.

Continued on next page (footnotes at end of table)

^{252}Cf SF decay [1999Bu32](#), [1993Ar05](#), [1986Ma22](#) (continued) ^{112}Pd Levels (continued)# Band(A): Member of $\Delta J=2$ ground-state band.@ Band(B): Member of $\Delta J=1$ quasi-gamma band.& Band(C): Member of $\Delta J=2$ band based on (5^-) ; configuration= $\nu h_{11/2} \otimes (g_{7/2} d_{5/2})$, $\alpha=1$.^a Band(D): Member of $\Delta J=2$ band based on (6^-) ; configuration= $\nu h_{11/2} \otimes (g_{7/2} d_{5/2})$, $\alpha=0$.^b Band(E): Member of $\Delta J=2$ band based on (7^-) ; configuration= $\nu h_{11/2} \otimes (s_{1/2} d_{3/2})$, $\alpha=1$. $\gamma(^{112}\text{Pd})$ I γ normalization: from [1971Ch44](#).

E_γ [†]	I_γ ^{†‡}	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
213.1 5	2.8	1096.2	3 ⁺	883.1	4 ⁺		
309.2 5		2578.7	(6 ⁻)	2269.5	(5 ⁻)		
320.2 5	1.1	2898.9	(8 ⁻)	2578.7	(6 ⁻)		
348.8 3	100	348.8	2 ⁺	0.0	0 ⁺	(E2)	
359.4 3	14	1096.2	3 ⁺	736.8	2 ⁺	M1+E2	Mult.: $A_2=-0.16$ 7; $A_4=-0.06$ 8, gated on 359.4 γ and 736.8 γ in 1999Bu32 .
388.0 3	22	736.8	2 ⁺	348.8	2 ⁺	M1+E2	Mult.: $A_2=0.08$ 4; $A_4=0.28$ 5, gated on 388.0 γ and 348.8 γ in 1999Bu32 .
400.2 5		2755.3	(4)	2355.1			
432.9 5	2.8	3137.2	(9 ⁻)	2704.3	(7 ⁻)		
434.8 [#] 5		2704.3	(7 ⁻)	2269.5	(5 ⁻)		
436.3 5		2194.8	(4 ⁻)	1758.5	(5 ⁺)		
479.0 5	4.8	1362.1	(4 ⁺)	883.1	4 ⁺		
479.5 5		2194.8	(4 ⁻)	1715.3	(3 ⁻ , 4 ⁺)		
485.8 5		2755.3	(4)	2269.5	(5 ⁻)		
534.3 3	64	883.1	4 ⁺	348.8	2 ⁺	E2	Mult.: $A_2=0.14$ 2; $A_4=-0.01$ 2, gated on 534.3 γ and 348.8 γ in 1999Bu32 .
547.8 5	3.5	3597.9	(12 ⁺)	3050.1	10 ⁺		
548.0 5	0.8	3446.9	(10 ⁻)	2898.9	(8 ⁻)		
554.1 5	1.3	3266.0	(9 ⁻)	2711.9	(7 ⁻)		
560.5 5		2755.3	(4)	2194.8	(4 ⁻)	D	Mult.: $A_2=0.14$ 3; $A_4=-0.02$ 4, gated on 560.5 γ and 1098.6 γ in 1999Bu32 .
601.9 5		3084.4	(9 ⁺)	2482.5	(7 ⁺)		
607.7 5		3744.9	(11 ⁻)	3137.2	(9 ⁻)		
619.1 5		1715.3	(3 ⁻ , 4 ⁺)	1096.2	3 ⁺		
625.3 5	3.5	1362.1	(4 ⁺)	736.8	2 ⁺		
640.1 5	1.3	2002.2	(6 ⁺)	1362.1	(4 ⁺)		
662.3 5	2.1	1758.5	(5 ⁺)	1096.2	3 ⁺		
667.3 3	35	1550.4	6 ⁺	883.1	4 ⁺	E2	Mult.: $A_2=0.13$ 2; $A_4=-0.03$ 3, gated on 667.3 γ and 534.3 in 1999Bu32 .
688.5 5	0.8	2690.7	(8 ⁺)	2002.2	(6 ⁺)		
724.0 5	0.4	2482.5	(7 ⁺)	1758.5	(5 ⁺)		
724.0 5	0.8	4321.9	(14 ⁺)	3597.9	(12 ⁺)		
731.9 5	5.3	3050.1	10 ⁺	2318.2	8 ⁺	E2	Mult.: $A_2=0.14$ 5; $A_4=0.02$ 5, gated on 731.9 γ and 767.8 γ in 1999Bu32 .
736.8 5	7.2	736.8	2 ⁺	0.0	0 ⁺		
747.4 3	12	1096.2	3 ⁺	348.8	2 ⁺		
767.8 3	11	2318.2	8 ⁺	1550.4	6 ⁺	E2	Mult.: $A_2=0.16$ 5; $A_4=-0.01$ 6, gated on 767.8 γ and 667.3 γ in 1999Bu32 .
819.0 5	1.1	3137.2	(9 ⁻)	2318.2	8 ⁺		
832.2 5		1715.3	(3 ⁻ , 4 ⁺)	883.1	4 ⁺		
963.8 5	0.4	2966.0		2002.2	(6 ⁺)		

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^{252}Cf SF decay [1999Bu32](#),[1993Ar05](#),[1986Ma22](#) (continued) $\gamma(^{112}\text{Pd})$ (continued)

E_γ [†]	I_γ ^{†‡}	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
978.5 5		1715.3	(3 ⁻ ,4 ⁺)	736.8	2 ⁺		
996.8 5		2755.3	(4)	1758.5	(5 ⁺)		
1028.3 5	2.0	2578.7	(6 ⁻)	1550.4	6 ⁺		
1040.0 5		2755.3	(4)	1715.3	(3 ⁻ ,4 ⁺)		
1098.6 5		2194.8	(4) ⁻	1096.2	3 ⁺	E1	Mult.: A ₂ =0.07 5; A ₄ =0.03 6, gated on 1098.6 γ and 359.4 γ in 1999Bu32 .
1140.3 5		2690.7	(8 ⁺)	1550.4	6 ⁺		
1153.9 5	4.3	2704.3	(7 ⁻)	1550.4	6 ⁺		
1161.5 5	3.0	2711.9	(7 ⁻)	1550.4	6 ⁺		
1204.9 5		2755.3	(4)	1550.4	6 ⁺		
1311.7 5		2194.8	(4) ⁻	883.1	4 ⁺		
1386.4 5	5.0	2269.5	(5 ⁻)	883.1	4 ⁺		
1415.6 5	2.6	2966.0		1550.4	6 ⁺		
1472.0 5		2355.1		883.1	4 ⁺		
1659.1 5		2755.3	(4)	1096.2	3 ⁺		
1872.2 5		2755.3	(4)	883.1	4 ⁺		

[†] From [1999Bu32](#). $\Delta E_\gamma=0.3$ for $I_\gamma>10$ and 0.5 for $I_\gamma<10$ set by the evaluators.

[‡] For absolute intensity per 100 decays, multiply by 0.76 19.

Placement of transition in the level scheme is uncertain.

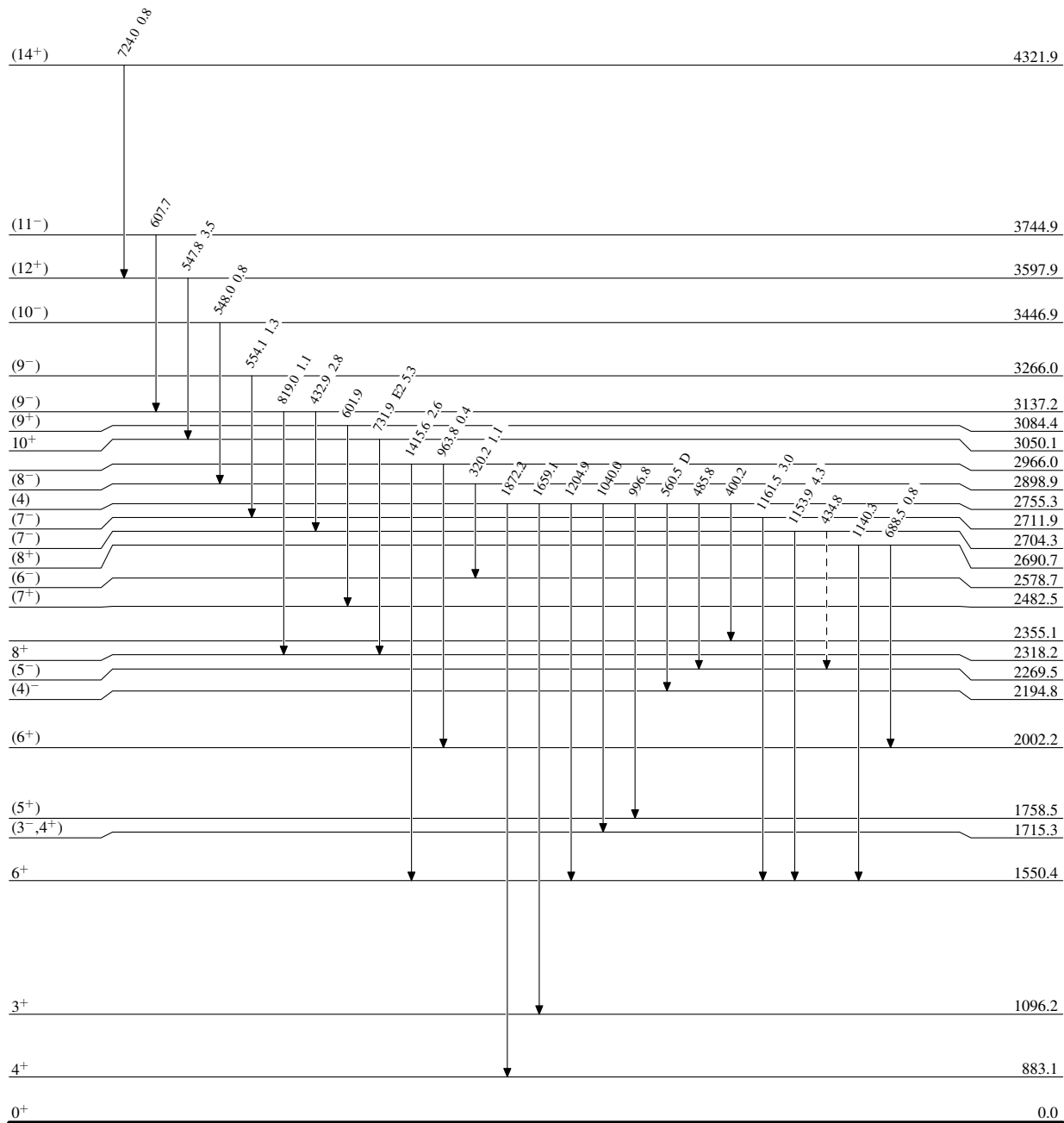
^{252}Cf SF decay 1999Bu32,1993Ar05,1986Ma22

Legend

Level Scheme

Intensities: Relative I_γ

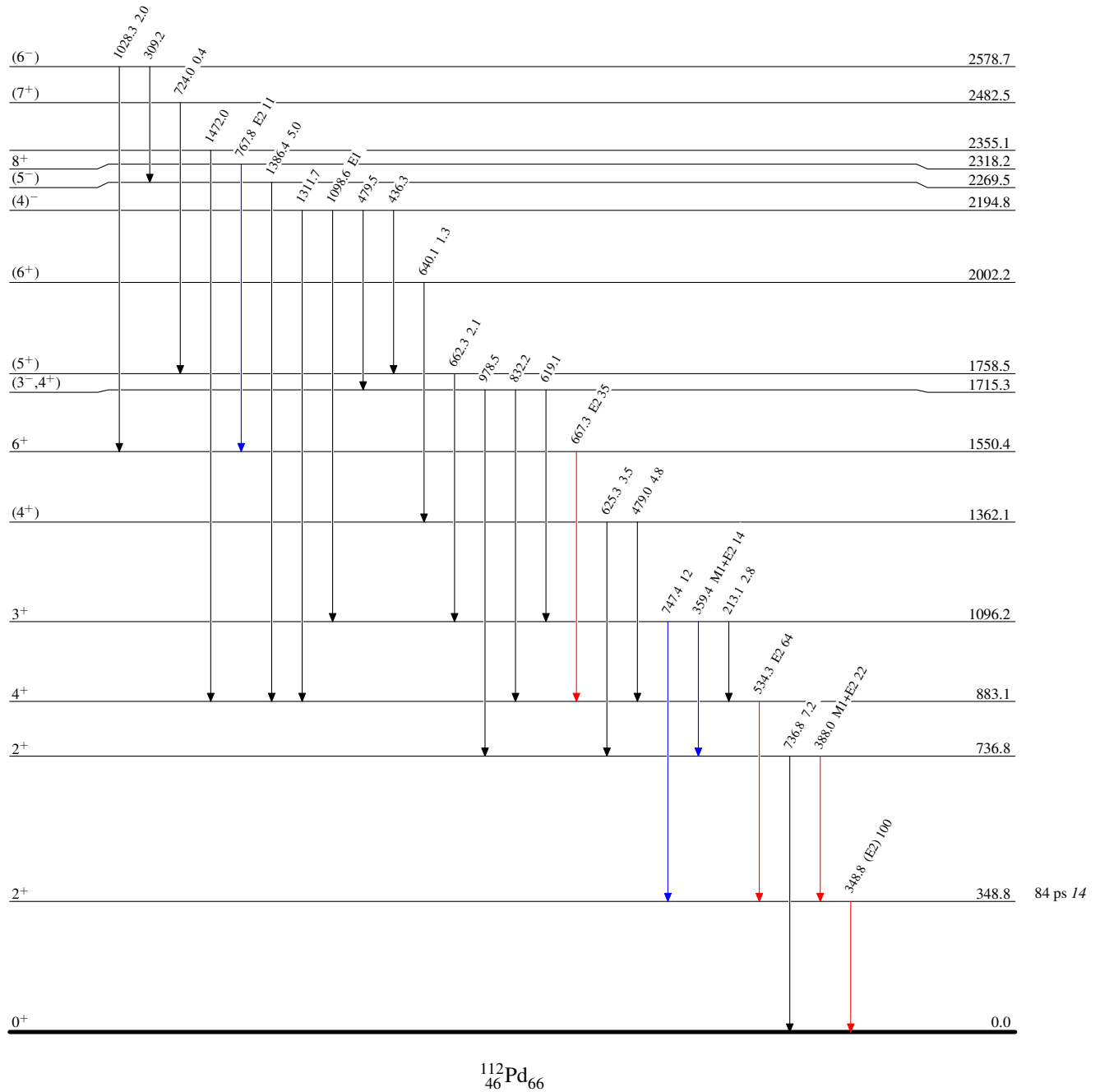
- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\max}$
 $\cdots \longrightarrow$ γ Decay (Uncertain)

 $^{112}_{46}\text{Pd}_{66}$

^{252}Cf SF decay 1999Bu32,1993Ar05,1986Ma22**Level Scheme (continued)**Intensities: Relative I_γ

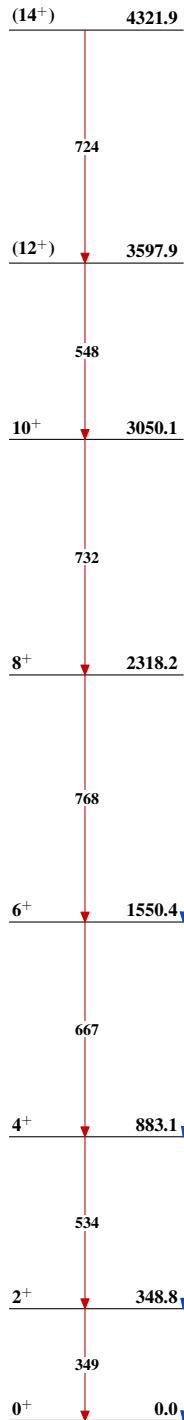
Legend

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

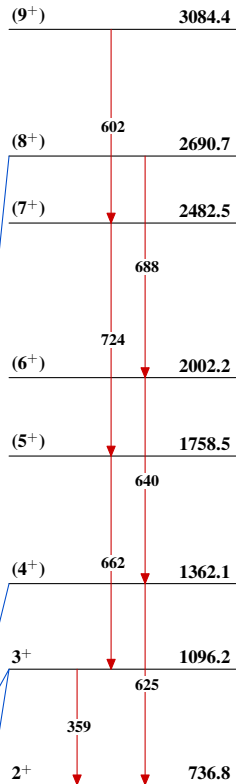


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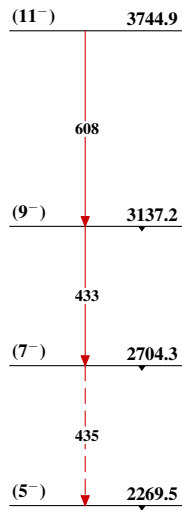
Band(A): Member of $\Delta J=2$
ground-state band



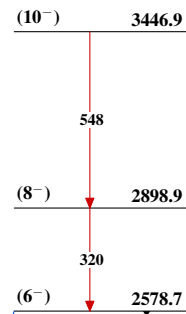
Band(B): Member of $\Delta J=1$
quasi-gamma band



Band(C): Member of $\Delta J=2$
band based on (5⁻);
configuration=
 $\nu h_{11/2} \otimes (g_{7/2} d_{5/2})$, $\alpha=1$



Band(D): Member of $\Delta J=2$
band based on (6⁻);
configuration=
 $\nu h_{11/2} \otimes (g_{7/2} d_{5/2})$, $\alpha=0$



Band(E): Member of $\Delta J=2$
band based on (7⁻);
configuration=
 $\nu h_{11/2} \otimes (s_{1/2} d_{3/2})$, $\alpha=1$

