Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	14-Jan-2022

Q(β^-)=4165 *4*; S(n)=7036 *8*; S(p)=13781 *9*; Q(α)=−7592 *4* 2021Wa16
S(2n)=11700 *7*, S(2p)=25897 *4* (2021Wa16).
Mass measurements: 2011Ha48, 2007Ha20, 2004Ge18.
1969We11: identification of ^{118}Pd isotope in ^{235}U(n,F) reaction followed by chemical separation of products and parent.
Later work by 1989Ko22 (also 1988Pe13) isolated this isotope in ^{238}U(p,F) reaction by ion-guided on-line mass separation.
1993Ja03: ^{238}U(p,F) reaction, on-line mass separation, detailed study of decay of ^{118}Pd to ^{118}Ag.
Additional information 1.
Theoretical calculations: 27 references (21 for structure and seven for half-lives and decay modes) from the NSR database available at www.nndc.bnl.gov/nsr/ are listed in the 'document' records in this dataset.

^{118}Pd Levels

Cross Reference (XREF) Flags

- A ^{118}Rh β^- decay (286 ms)
- B ^{252}Cf SF decay
- C ^{238}U(α,Fγ)
- D ^{238}U(^{12}C,Fγ)

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
0.0[#]	0$^+$	1.9 s *1*	ABCD	%β^-=100 $T_{1/2}$: from 1989Ko22 (γ-multiscaling; also 1988Pe13 from the same group who reported measured $T_{1/2}$=2.24 s *17*). Other: 3.1 s *3* (1969We11, from fission studies).
378.6[#] *1*	(2$^+$)		ABCD	J$^\pi$: systematics of even-even nuclides.
812.60[@] *13*	(2$^+$)[‡]		ABC	
953.19[#] *14*	(4$^+$)		ABCD	
1020.3 *5*	(0$^+$)		A	J$^\pi$: γ to (2$^+$), systematics.
1182.60[@] *14*	(3$^+$)[‡]		ABC	
1461.6[@] *3*	(4$^+$)[‡]		ABC	
1671.40[#] *17*	(6$^+$)		ABCD	
1824.0 *4*			A	J$^\pi$: γ to (4$^+$).
1855.5[@] *6*	(5$^+$)[‡]		BC	
1871.1 *4*	(4$^-$)		A	J$^\pi$: γ to (3$^+$); systematics of even Pd nuclides.
1989.69[&] *17*	(5$^-$)		ABC	
2180.4[@] *6*	(6$^+$)		BC	J$^\pi$: ΔJ=2, quadrupole γ to (4$^+$); member of γ band.
2210.7[a] *6*			BC	E(level): ordering of the 539.3-411.2 cascade is from ^{252}Cf SF decay; not established in (α,Fγ).
2480.1[&] *4*	(7$^-$)		BCD	
2492.8[#] *6*	(8$^+$)		BC	J$^\pi$: ΔJ=2, quadrupole γ to (6$^+$); band member.
2542.7 *4*	(6$^-$)		A	J$^\pi$: γ rays to (4$^-$) and (5$^-$); systematics of even-A Pd nuclides.
2622.9[@] *8*	(7$^+$)[‡]		C	
2623.2[a] *8*			BC	
3029.9[&] *7*	(9$^-$)		BC	
3093.6[a] *9*			BC	
3286.7[#] *8*	(10$^+$)		BC	
3663.2[&] *8*	(11$^-$)		BC	
3775.3[a] *11*			BC	

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Adopted Levels, Gammas (continued)

^{118}Pd Levels (continued)

E(level)[†]	Jπ	XREF
3811.5[a] *11*		C
4143.1[#] *9*	(12$^+$)	BCD
4389.1[&] *10*	(13$^-$)	BC
4638.9[a] *12*		C

[†] From least-squares fit to Eγ values, assuming 0.5 keV uncertainty for Eγ, when not given. Note that low reduced χ^2 0.041 reflects the fact that most of the levels decay by single γ rays.
[‡] Possible member of γ band.
[#] Band(A): g.s. band.
[@] Band(B): γ band.
[&] Band(C): Octupole band.
[a] Band(D): Side band.

γ(^{118}Pd)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	Comments
378.6	(2$^+$)	378.6 *1*	100	0.0	0$^+$		
812.60	(2$^+$)	434.0 *1*	100 *4*	378.6	(2$^+$)		
		812.5 *4*	60 *20*	0.0	0$^+$		Iγ(812.5)/Iγ(434.0)=0.6 *2* in β^- decay.
953.19	(4$^+$)	574.6 *1*	100	378.6	(2$^+$)		
1020.3	(0$^+$)	641.7 *4*	100	378.6	(2$^+$)		
1182.60	(3$^+$)	370.0 *2*	100 *11*	812.60	(2$^+$)		
		804.0 *1*	89 *11*	378.6	(2$^+$)		I_γ: other: 36 in ^{252}Cf SF decay.
1461.6	(4$^+$)	508.5 *5*		953.19	(4$^+$)		E_γ: γ from β^- decay only.
		649.0 *3*	100 *17*	812.60	(2$^+$)		
1671.40	(6$^+$)	718.2 *1*	100	953.19	(4$^+$)		
1824.0		870.8 *3*	100	953.19	(4$^+$)		
1855.5	(5$^+$)	672.9[‡] *5*	100[‡]	1182.60	(3$^+$)		
1871.1	(4$^-$)	688.5 *4*		1182.60	(3$^+$)		
1989.69	(5$^-$)	528.0 *5*		1461.6	(4$^+$)		
		1036.5 *1*	100 *8*	953.19	(4$^+$)		
2180.4	(6$^+$)	718.8[‡] *5*	100[‡]	1461.6	(4$^+$)	Q	Mult.: From (821.4γ)(718.3γ)(θ) in ^{252}Cf SF decay.
2210.7		539.3[‡] *5*	100[‡]	1671.40	(6$^+$)		Ordering of the 412.5γ → 539.3γ cascade in ^{252}Cf SF decay (2013Lu18) is determined from the intensity of the 539.3γ as 18% *3* stronger than that of the 412.5γ.
2480.1	(7$^-$)	490.6[‡] *5*	25.4[‡]	1989.69	(5$^-$)		
		808.6[‡] *5*	100[‡]	1671.40	(6$^+$)		
2492.8	(8$^+$)	821.4[‡] *5*	100[‡]	1671.40	(6$^+$)	Q	Mult.: From (821.4γ)(718.3γ)(θ) in ^{252}Cf SF decay.
2542.7	(6$^-$)	553.0 *5*		1989.69	(5$^-$)		
		671.5 *4*		1871.1	(4$^-$)		
2622.9	(7$^+$)	767.4[#]		1855.5	(5$^+$)		
2623.2		412.5[‡] *5*	100[‡]	2210.7			See comment fro 539.3γ from 2210.7 level.
3029.9	(9$^-$)	549.8[‡] *5*	100[‡]	2480.1	(7$^-$)		
3093.6		470.4[‡] *5*	100[‡]	2623.2			E_γ: 468.6 in (α,Fγ).
3286.7	(10$^+$)	793.9[‡] *5*	100[‡]	2492.8	(8$^+$)		E_γ: 795.0 in (α,Fγ) placed from 4143.4, 12$^+$ level.
3663.2	(11$^-$)	633.3[‡] *5*	100[‡]	3029.9	(9$^-$)		E_γ: 631.6 in (α,Fγ).
3775.3		681.7[‡] *5*	100[‡]	3093.6			E_γ: 680.0 in (α,Fγ) placed from 3302.4 level.

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Adopted Levels, Gammas (continued)

$\gamma(^{118}Pd)$ (continued)

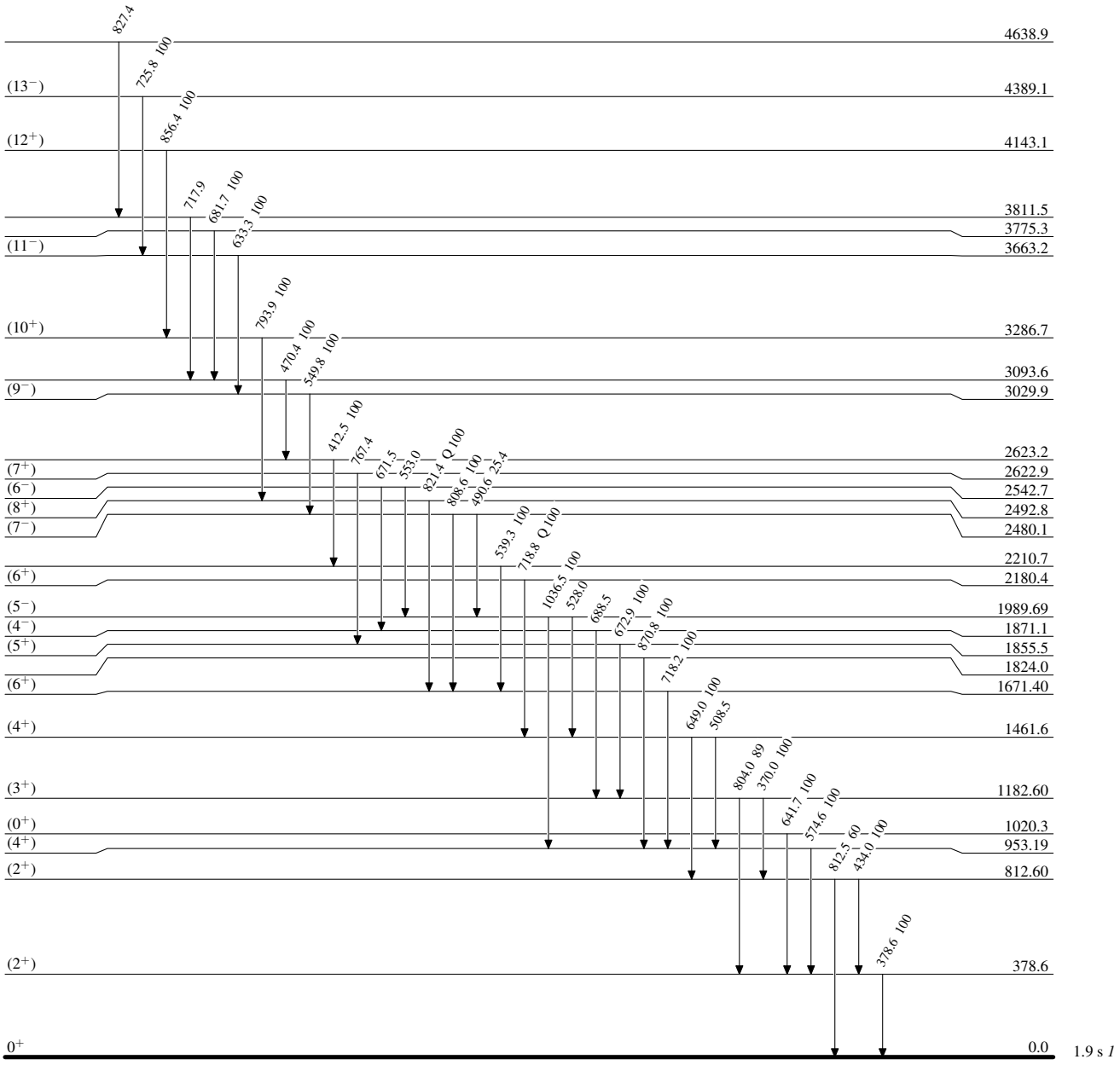
E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Comments
3811.5		717.9[#]		3093.6		
4143.1	(12^+)	856.4[‡] *5*	100[‡]	3286.7	(10^+)	E_γ: 855.5 in $(\alpha,F\gamma)$ placed from 3348.4, 10^+ level.
4389.1	(13^-)	725.8[‡] *5*	100[‡]	3663.2	(11^-)	
4638.9		827.4[#]		3811.5		

[†] From ^{118}Rh β^- decay, unless otherwise specified.
[‡] From ^{252}Cf SF decay.
[#] From $^{238}U(\alpha,F\gamma)$.

Adopted Levels, Gammas

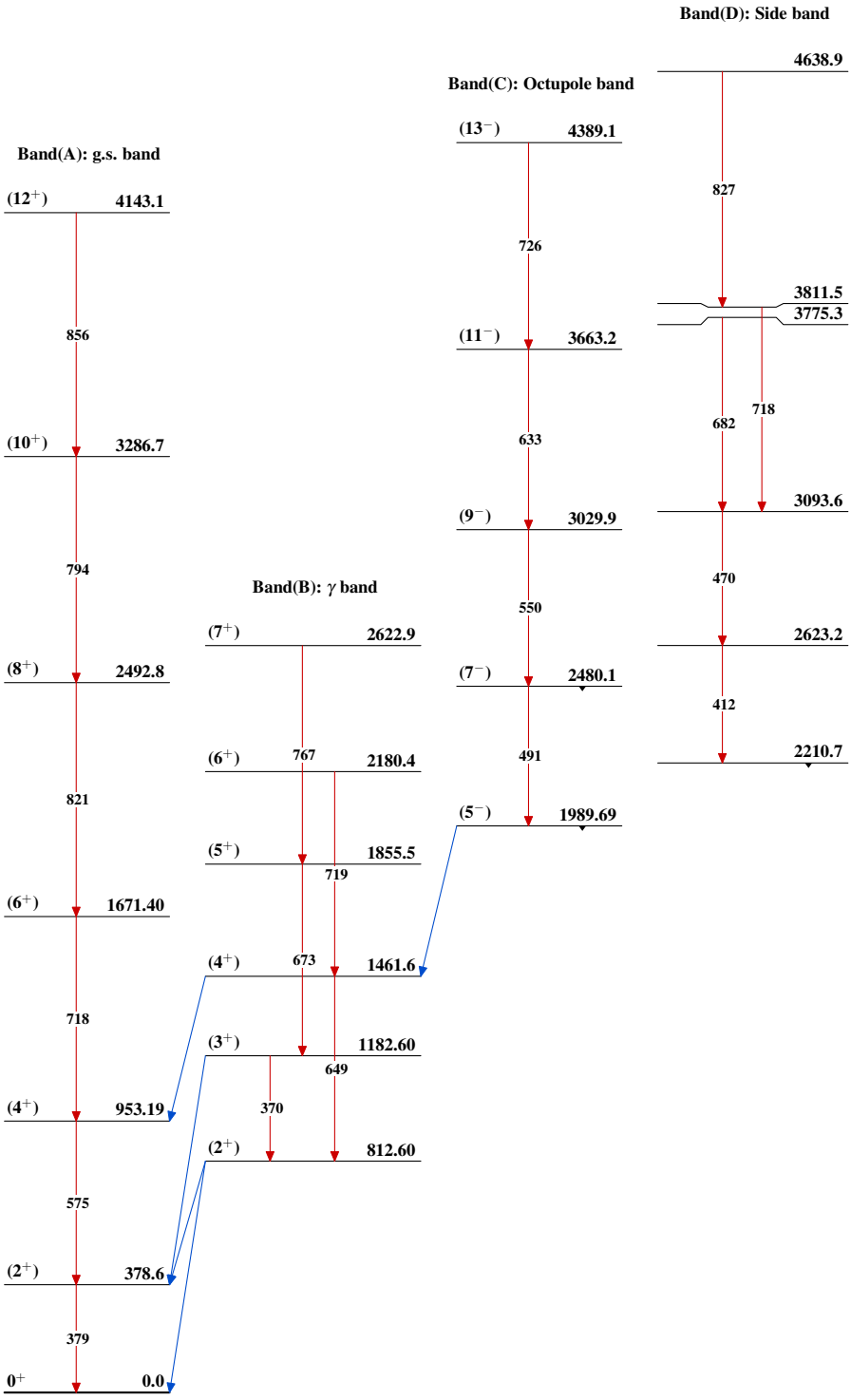
Level Scheme

Intensities: Relative photon branching from each level



$^{118}_{46}Pd_{72}$

Adopted Levels, Gammas



$^{118}_{46}Pd_{72}$