Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan	NDS 151, 334 (2018)	30-Jun-2018

Q(β^-)=−8950 *80*; S(n)=9240 *80*; S(p)=1400 *SY*; Q(α)=6607 *3* 2012Wa38
ΔS(p)=120 (2012Wa38).
Identification: excitation functions for ^{112}Sn(^{63}Cu,pxn) and relative positions for α's from known Pt activities (1981De22); genetic relationship to ^{167}Os daughter (1981Ho10).
Calculation of α decay half-life: 2013Ha05 (modified barrier penetration formula; good agreement with experimental value); 2011Ta23 (semiempirical, one-parameter model).

^{171}Pt Levels

Cross Reference (XREF) Flags

A	^{175}Hg α decay	D	^{96}Ru(^{78}Kr,2pnγ)
B	^{96}Mo(^{78}Kr,3nγ)	E	^{171}Pt IT decay
C	^{116}Sn(^{58}Ni,3nγ), Sn(^{60}Ni,xnγ)		

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
0.0	(7/2$^-$)	45.5 ms *25*	A E	%α=90 *7*; %ε+%β^+=10 *7* %α: unweighted average of 83 *3* (2010Sc02) and 96 *5* (2004GoZZ). Only α decay of ^{171}Pt has been observed (1981De22,1981Ho10,1982En03,1997Uu01,2004GoZZ,2010Sc02). Gross β decay theory predicts a partial β halflife≈2 s (1973Ta30), implying %ε+%β^+≈2. %ε+%β^+: from 100−%α. Jπ: M1 90γ from (9/2$^-$) 90 level; unhindered α decay to (7/2$^-$) ^{167}Os g.s.. same As g.s. Jπ for ^{169}Pt but not ^{173}Pt. $T_{1/2}$: unweighted average of 40 ms *10* (1981De22), 43 ms *3* (1996Pa01), 51 ms *2* (2002Ro17), 48 ms *1* (2010Sc02); the weighted average is 48.1 ms *12*. Other values:>20 ms (1981Ho10), 20 ms *6* (1982En03), 25 ms *+11−6* (1997Uu01).
89.5 *7*	(9/2$^-$)		E	Jπ: M2 323γ from (13/2$^+$) 413 level.
412.6# *10*	(13/2$^+$)	901 ns *9*	BCDE	%IT=100 $T_{1/2}$: from 2010Sc02 In ^{171}Pt IT decay.
857.6# *10*	(17/2$^+$)		BCD	
1462.3# *10*	(21/2$^+$)		BCD	
1473.5 *10*			D	
2131.7# *10*	(25/2$^+$)		BCD	
2816.6# *10*	(29/2$^+$)		BCD	
3516.6?#	(33/2$^+$)		B	

† From adopted Eγ data.
‡ From (^{78}Kr,3nγ), except as noted; based on the very close similarity between level spacings in ^{171}Pt and in the g.s. band of ^{172}Pt, 1998Se20 suggest that the states excited in their fusion-evaporation reaction (which is expected to strongly populate (ν $i_{13/2}$) bands) result from the coupling of a rotationally-aligned $i_{13/2}$ neutron to 0$^+$, 2$^+$, ..., 10$^+$ excitations of the core.
# Band(A): probable $i_{13/2}$, α=+1/2 band. Either ν $i_{13/2}$ weakly coupled to vibrational core or decoupled ν $i_{13/2}$ rotational band with $i^2_{13/2}$ alignment (2003Ba32).

Adopted Levels, Gammas (continued)

$\gamma(^{171}Pt)$

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[&]	Comments
89.5	(9/2$^-$)	89.5[#] *7*	100	0.0	(7/2$^-$)	M1	9.15 *25*	Mult.: from α(K)exp In IT decay.
412.6	(13/2$^+$)	323.1[#] *6*	100	89.5	(9/2$^-$)	M2	0.926 *15*	B(M2)(W.u.)=0.165 *3* Mult.: from α(K)exp and sub-shell ratios In IT decay.
857.6	(17/2$^+$)	445.0 *2*	100	412.6	(13/2$^+$)	(E2)	0.0331	
1462.3	(21/2$^+$)	604.7 *2*	100	857.6	(17/2$^+$)	(E2)	0.01581	E_γ: other: 605.4 *2* In ^{116}Sn(^{58}Ni,3nγ), Sn(^{60}Ni,xnγ).
1473.5		615.9 *2*	100	857.6	(17/2$^+$)			
2131.7	(25/2$^+$)	669.4 *2*	100	1462.3	(21/2$^+$)	(E2)	0.01260	E_γ: other: 670.2 *3* In ^{116}Sn(^{58}Ni,3nγ), Sn(^{60}Ni,xnγ).
2816.6	(29/2$^+$)	684.9 *2*	100	2131.7	(25/2$^+$)			
3516.6?	(33/2$^+$)	700[@ *a*]	100	2816.6	(29/2$^+$)			

[†] From ^{96}Ru(^{78}Kr,2pnγ), except as noted.
[‡] From $\gamma(\theta)$ In ^{96}Ru(^{78}Kr,2pnγ), assigning $\Delta\pi$=(No) to intraband transitions, except As noted.
[#] From IT decay.
[@] From ^{96}Mo(^{78}Kr,3nγ), uncertainty unstated by authors.
[&] 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.
[*a*] Placement of transition in the level scheme is uncertain.

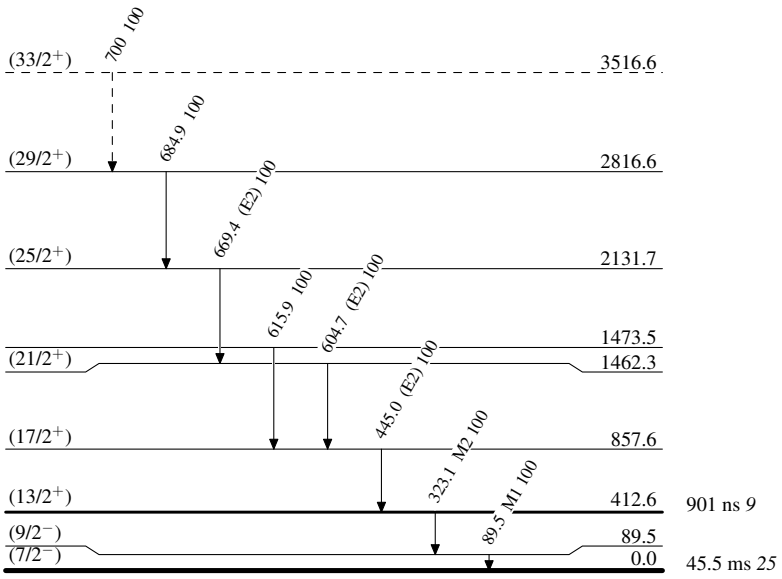
Adopted Levels, Gammas

Legend

Level Scheme

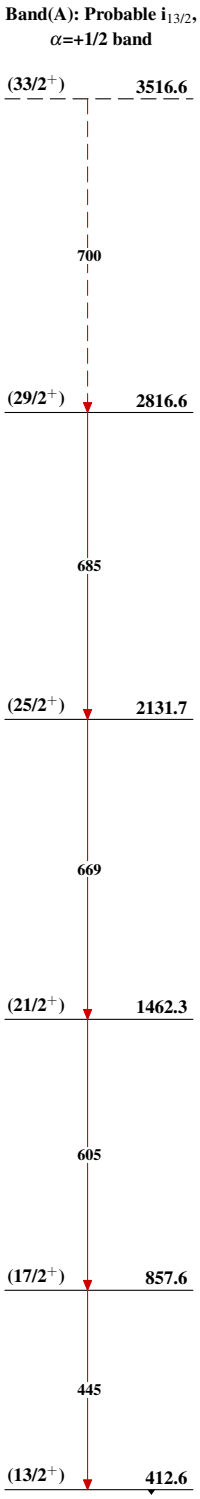
Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{171}_{78}Pt_{93}$

Adopted Levels, Gammas



$^{171}_{78}Pt_{93}$