Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

Q(β^-)=−7060 *SY*; S(n)=9340 *SY*; S(p)=−74 *SY*; Q(α)=6110 *SY* 2017Wa10
ΔQ(β^-)=ΔS(n)=ΔS(p)=90; ΔQ(α)=50 (2017Wa10).
S(2n)=20836 (syst) *104*; S(2p)=2143 (syst) *94*; Q(εp)=7760 (syst) *90* (2017Wa10).

^{170}Ir Levels

For calculated α decay branching ratios see 2017Zh03, 2016Sa16.

Cross Reference (XREF) Flags

A ^{174}Au α decay (162.9 ms)
B ^{174}Au α decay (139 ms)
C ^{112}Sn(^{60}Ni,pnγ)

E(level)‡	Jπ†@	$T_{1/2}$	XREF	Comments
0.0#	(3$^-$)#	0.87 s *+18−12*	A	%α=5.2 *17*; %ε+%β^+=94.8 *17* %α: from measurement of 5815α (2002Ro17). $T_{1/2}$: from 5815α(t) (2002Ro17). See also comment on $T_{1/2}$ for 0+x level. E(level): the identification of this level As the ^{170}Ir g.s. (2002Ro17) is based on the consistency of Eα=5815 from this level with Eα systematics for neighboring Ir isotopes (^{167}Ir to ^{174}Ir).
0+x#	(8$^+$)#	811 ms *18*	BC	%α=38 *5*; %ε+%β^+≤62 *5*; %IT≤62 *5* %α: weighted average of 36 *10* (1996Pa01) and 39 *6* (2004GoZZ). Note, however, that Eα reported by 1996Pa01 and 2004GoZZ for decay from this level differ from values from 2007Ha45. 1978Sc26 suggested %α≈100 based only on α-decay systematics. $T_{1/2}$: authors′ recommended value from 2007Ha45, based on the following α(t) data: 802 ms *+30−28* (6007α), 826 ms *+30−28* (6053α), 830 ms *+58−53* (5951α), 801 ms *+63−57* (6121α). Others: 0.43 s *5* (2002Ro17, 6082α), 0.83 s *30* (1996Pa01, 6083α), 1.05 s *15* (1978Sc26, 6030α), 1.1 s *2* (1977Ca23 and 1978Ca11, 6010α), 0.8 s *2* (1977ScYH, 6045α); it is unclear whether these all belong to the ^{170}Ir high-spin isomer.
152.5+x *2*	(9$^+$)		BC	Jπ: suggested by 2004GoZZ; this state is populated In α decay from (9$^+$) ^{174}Au by the strongest, least hindered branch and that branch is possibly unhindered. Consistent with (M1) 153γ to tentative (8$^+$) 0+x level.
190.56+x *24*	(7$^-$,8$^-$,9$^-$)		BC	Jπ: (E1) 191γ to (8$^+$) 0+x.
370.19+x *10*	(−)		C	Jπ: 132γ from (9$^-$) 502+x is probably not E1.
501.69+x[a] *23*	(9$^-$)		C	Jπ: based on plot of aligned angular momentum for band containing this level compared with that for 11/2[505] band In ^{171}Ir and on the apparent blocking of the (ν $i^2_{13/2}$) band crossing seen In ^{171}Ir, 2007Ha45 suggest a configuration with a deformation-aligned (π 11/2[505]) coupled to a rotationally-aligned (ν 1/2[660]). J=9 is the closest integer to their predicted spin for such a coupling.
768.91+x[&] *24*	(10$^-$)		C	
1041.52+x[a] *25*	(11$^-$)		C	
1382.5+x[&] *3*	(12$^-$)		C	

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Adopted Levels, Gammas (continued)

^{170}Ir Levels (continued)

E(level)‡	Jπ†@	XREF
1717.3+x[a] 4	(13⁻)	C
2087.4+x[&] 4	(14⁻)	C

† Values given without further comment are from 2007Ha45 In ^{112}Sn(^{60}Ni,pnγ) and are based on the authors′ deduced band structure and total Routhian surface calculations.
‡ From least-squares fit to measured Eγ.
# Total routhian surface calculations (2007Ha45) indicate α γ-soft nucleus with $\beta_2 \approx 0.15$ and $\gamma \approx 15°$ for the energetically most favored orbitals, namely, 11/2[505] ($1h_{11/2}$), 3/2[420] ($2d_{3/2}$) or 1/2[400] ($3s_{1/2}$) for the 77th proton coupled to 3/2[521], 5/2[512], 7/2[514] ($1h_{9/2}$) or 5/2[523] ($2f_{7/2}$) or 1/2[660] ($1i_{13/2}$) for the 93rd neutron. The isotopes ^{169}Ir and ^{171}Ir exhibit $1/2^+$ ground states and $11/2^-$ isomers; the isotone ^{169}Os has a possible $5/2^-$ ground state based on its unhindered α decay to a probable 5/2[523] g.s. In ^{165}W. If the Gallagher-Moszkowski rule is valid At this deformation, coupling a $1/2^+$ or $11/2^-$ proton with a $5/2^-$ neutron would result In low-lying 3^- and 8^+ levels, consistent with Jπ proposed by 2004GoZZ. However, these Jπ assignments must be considered highly tentative.
@ Additional information 1.
& Band(A): Possible (π 11/2[505])+(ν 1/2[660]) α=0 band. Tentative configuration assignment supported by band′s rotational properties (energy staggering, intraband B(M1)/B(E2) ratios, comparison of aligned momentum with that for 11/2[505] band In ^{171}Ir, apparent blocking of ($\nu\ i^2_{13/2}$) band crossing present In ^{171}Ir 11/2[505] band). Total Routhian surface (TRS) calculations indicate γ-soft triaxial shapes with $\beta_2 \approx 0.15$ and $\gamma \approx 15°$ for low-lying yrast states In the energetically most favored configurations (2007Ha45).
[a] Band(a): Possible (π 11/2[505])+(ν 1/2[660]) α=1 band. See comment on signature partner band.

γ(^{170}Ir)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.	α‡	Comments
152.5+x	(9⁺)	152.5 2	100	0+x	(8⁺)	(M1)	1.84	Mult.: based on strength of Ir K x ray relative to I(153γ) In α-γ coin spectrum In ^{174}Au α decay (811 ms) (2004GoZZ).
190.56+x	(7⁻,8⁻,9⁻)	190.7 4	100	0+x	(8⁺)	(E1)	0.0769 12	Eγ: weighted average of 190.3 4 from (^{60}Ni,pnγ) and 190.2 5 from ^{174}Au α decay (811 ms). Mult.: based on absence of Ir K x ray In α-γ coin spectrum In ^{174}Au α decay (811 ms) (2004GoZZ).
370.19+x	(⁻)	218.4 2	82 9	152.5+x	(9⁺)			
		370.1# 1	≈100#	0+x	(8⁺)			Eγ: for doublet.
501.69+x	(9⁻)	131.5 2	100	370.19+x	(⁻)	[M1,E2]	2.2 7	Mult.: not E1 from intensity balance At the 502+x level (α(exp)>1.5 assuming intraband 267.3γ is M1) In (^{60}Ni,pnγ).
768.91+x	(10⁻)	267.3 1	100	501.69+x	(9⁻)	[M1]	0.385	
1041.52+x	(11⁻)	272.7 1	100 9	768.91+x	(10⁻)			
		539.5 2	24 8	501.69+x	(9⁻)			
1382.5+x	(12⁻)	340.9 2	100 14	1041.52+x	(11⁻)			
		613.6 8	42 14	768.91+x	(10⁻)			
1717.3+x	(13⁻)	335.0 2	≈100	1382.5+x	(12⁻)			Eγ: for doublet; placement of other component unknown.
		675.9 3	72 24	1041.52+x	(11⁻)			

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Adopted Levels, Gammas (continued)

$\gamma(^{170}Ir)$ (continued)

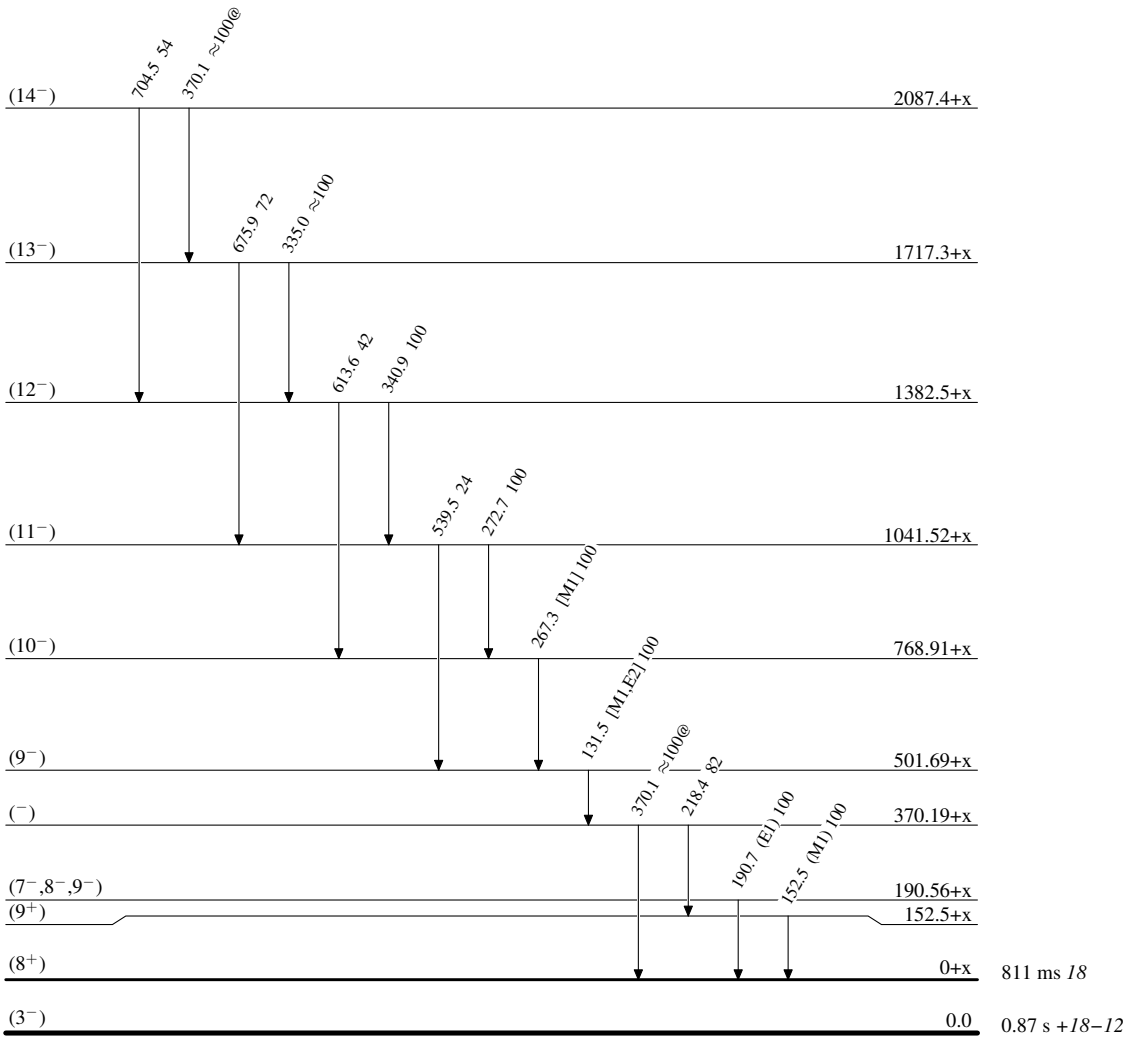
E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Comments
2087.4+x	(14$^-$)	370.1[#] *1*	≈100[#]	1717.3+x	(13$^-$)	E_γ: for doublet.
		704.5 *3*	54 *23*	1382.5+x	(12$^-$)	

[†] From ^{112}Sn(^{60}Ni,pnγ), except As noted.
[‡] 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.
[#] Multiply placed with intensity suitably divided.

Adopted Levels, Gammas

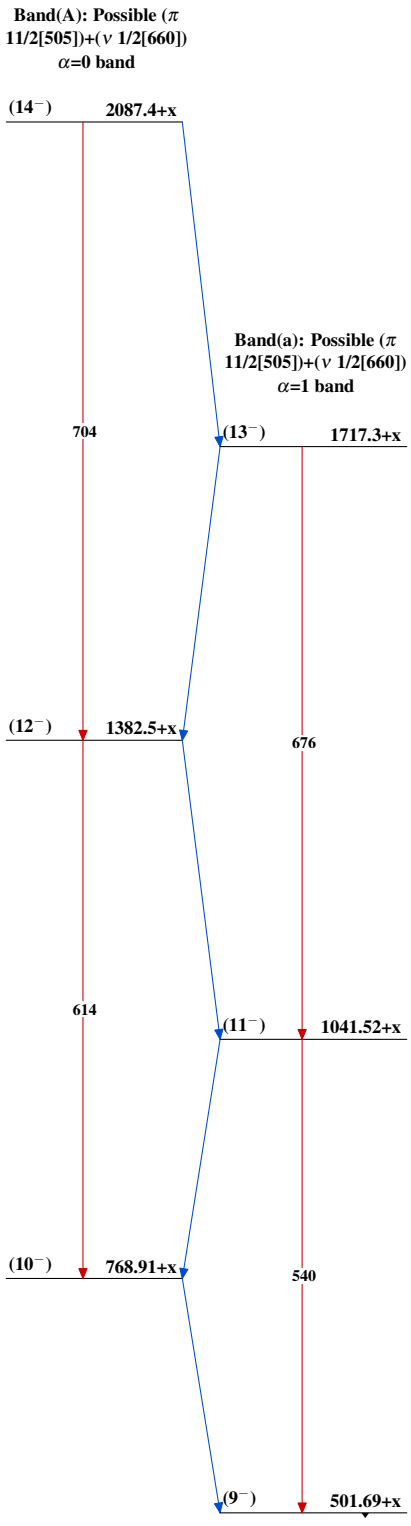
Level Scheme

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{170}_{77}Ir_{93}$

Adopted Levels, Gammas



$^{170}_{77}Ir_{93}$