^{179}Ir ε decay 1992Bo19,2000Ro41

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 110, 265 (2009)	15-Nov-2008

Parent: ^{179}Ir: E=0.0; $J^\pi=(5/2)^-$; $T_{1/2}$=79 s *1*; Q(ε)=4943 *21*; %ε+%$β^+$ decay=100.0

2000Ro41: measured E(ce), I(ce) using high-resolution magnetic spectrograph. source from successive decays from ^{183}Hg source.

1992Bo19: source from 240 MeV ^{36}Ar bombardment of ^{148}Nd enriched to 93.2%; He-jet tape transport; two Ge detectors; measured Eγ, Iγ, γ-K x ray coin, γγ coin, γ(t).

The decay scheme is that of 1992Bo19 with the addition of known 115 and 210 levels to accommodate the 95γ reported by 2000Ro41. Since Q+ is large (4943 *21*), and decay is observed only to populate levels with E≤320 keV, this decay scheme may be far from complete and the evaluator, therefore, considers deduced ε+$β^+$ feeding and log *ft* values to be unreliable. The apparent ε+$β^+$ feeding of the 243, 273 and 320 levels ($J^\pi=(9/2)^+$, $(9/2^-)$, $9/2^-$, respectively) is possibly consistent with a parent J^π of $7/2^-$, but not $5/2^-$; however, this may instead be attributable to incompleteness of the decay scheme. The latter branch must be <2% (from log $f^{1u}t$>8.5) and the other two should be negligible for decay from a $(5/2)^-$ parent. The principal decay branch appears to occur to the 145-keV, $(7/2)^-$ level and is almost certainly an allowed transition.

^{179}Os Levels

E(level)†	J^π‡	Comments
0.0[a]	$1/2^-$	
86.30[a] *10*	$3/2^-$	
100.2[a] *1*	$5/2^-$	
115.4 *8*	$(5/2^-)$	E(level): from Adopted Levels. energy held fixed In least-squares adjustment.
145.40[&] *15*	$(7/2)^-$	apparent %ε+%$β^+$=58 *6* to this level (log *ft*≈5.1).
210.8 *10*	$(7/2^-)$	E(level): introduced by evaluator to accommodate known 95γ reported by 2000Ro41.
242.90[@] *18*	$(9/2)^+$	apparent %ε+%$β^+$=14.3 *8* to this level (log *ft*≈5.7).
273.10[&] *18*	$(9/2^-)$	apparent %ε+%$β^+$=7.4 *16* to this level (log *ft*≈6.0).
320.20[#a] *23*	$9/2^-$	apparent %ε+%$β^+$=3.7 *4* to this level (log *ft*≈6.3).

† From Eγ.
‡ From Adopted Levels.
# An additional 24-keV γ is expected (from Adopted Gammas) to deexcite the 320 level. Based on I(220γ) here and adopted branching, its photon intensity in ^{179}Ir ε decay is expected to be 0.052 *12*, which is presumably far below the sensitivity limit in the decay study by 1992Bo19.
@ Band(A): 9/2[624] band.
& Band(B): 7/2[514] band.
a Band(C): 1/2[521] band.

γ(^{179}Os)

Iγ normalization: =0.075 *4* from Σ (I(γ+ce) to g.s.)=100%, assuming no ε+$β^+$ branch to g.s. (2nd forbidden transition), the mean of M1 and E2 theory values for α(86γ), and mult(100.2γ)=E2. However, if the decay scheme is incomplete (as seems likely given the significant intensity imbalance at $9/2^-$ and $9/2^+$ levels in this decay scheme), additional g.s. transitions may exist, necessitating a reduction in Iγ normalization. Consequently, Iγ normalization is given as approximate only.

E_γ†	E_i(level)	J^π_i	E_f	J^π_f	$I_{(\gamma+ce)}$#	Comments
(13.9)	100.2	$5/2^-$	86.30	$3/2^-$	8.0×10^2 *16*	$I_{(\gamma+ce)}$: from intensity balance at 86 and 100 levels, Ti(14γ)≤930 *30* and Ti(14γ)≥703 *59*, respectively. E_γ: from level energy difference; transition not observed.

Continued on next page (footnotes at end of table)

^{179}Ir ε decay 1992Bo19,2000Ro41 (continued)

γ(^{179}Os) (continued)

E_γ [†]	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	α[@]	Comments
45.2 *1*	97 *5*	145.40	(7/2)$^-$	100.2	5/2$^-$	M1		9.97	α(L)=7.69 *12*; α(M)=1.77 *3*; α(N+..)=0.511 *8* α(N)=0.431 *7*; α(O)=0.0744 *12*; α(P)=0.00552 *9* Mult.: L1:L2:M1=1530 *330*:190 *40*:370 *80* (2000Ro41).
86.3 *1*	100 *5*	86.30	3/2$^-$	0.0	1/2$^-$	M1+E2	−5.3 *7*	8.04	α(K)=1.13 *7*; α(L)=5.21 *9*; α(M)=1.333 *24*; α(N+..)=0.367 *7* α(N)=0.319 *6*; α(O)=0.0471 *9*; α(P)=0.000145 *8* Mult.,δ: from Adopted Gammas. K:L3:(M1+M2):M3=400 *100*:770 *150*:240 *50*:210 *50* (2000Ro41) implies E2(+M1), δ>2.7. %Iγ=7.5 *3* assuming suggested normalization.
95.4		210.8	(7/2$^-$)	115.4	(5/2$^-$)	M1		6.44	α(K)=5.32 *8*; α(L)=0.867 *13*; α(M)=0.199 *3*; α(N+..)=0.0576 *8* α(N)=0.0486 *7*; α(O)=0.00839 *12*; α(P)=0.000624 *9* E_γ: from 2000Ro41; uncertainty not stated by authors. Mult.: from α(K)exp≈6 (2000Ro41).
97.5 *1*	135 *7*	242.90	(9/2)$^+$	145.40	(7/2)$^-$	E1		0.417	α(K)=0.338 *5*; α(L)=0.0614 *9*; α(M)=0.01415 *21*; α(N+..)=0.00396 *6* α(N)=0.00339 *5*; α(O)=0.000545 *8*; α(P)=2.74×10^{-5} *4*
100.2 *1*	77 *4*	100.2	5/2$^-$	0.0	1/2$^-$	(E2)		4.32	α(K)=0.796 *12*; α(L)=2.66 *4*; α(M)=0.680 *10*; α(N+..)=0.187 *3* α(N)=0.1630 *24*; α(O)=0.0240 *4*; α(P)=8.36×10^{-5} *12* Mult.,δ: K:L2=180 *40*:250 *50* (2000Ro41). δ(E2,M1)>3.
127.7 *1*	31 *3*	273.10	(9/2$^-$)	145.40	(7/2)$^-$	(M1+E2)		2.2 *6*	α(K)=1.4 *9*; α(L)=0.62 *25*; α(M)=0.15 *7*; α(N+..)=0.043 *19* α(N)=0.037 *17*; α(O)=0.0058 *22*; α(P)=0.00016 *12*
220.0 *2*	40 *4*	320.20	9/2$^-$	100.2	5/2$^-$	(E2)		0.242	α(K)=0.1323 *19*; α(L)=0.0828 *12*; α(M)=0.0208 *3*; α(N+..)=0.00577 *9* α(N)=0.00500 *8*; α(O)=0.000761 *11*; α(P)=1.259×10^{-5} *18*

[†] From 1992Bo19, except As noted.
[‡] From Adopted Gammas, except as noted.
[#] For absolute intensity per 100 decays, multiply by ≈0.075.
[@] 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.

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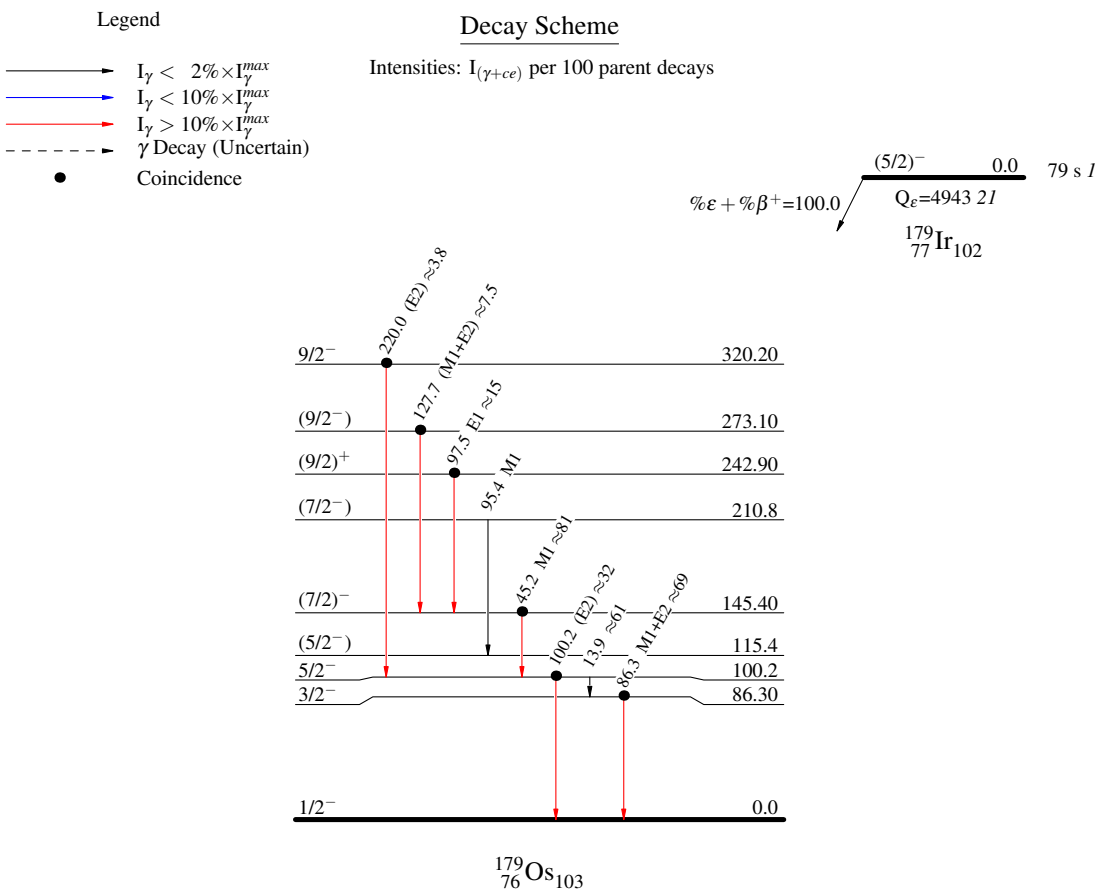
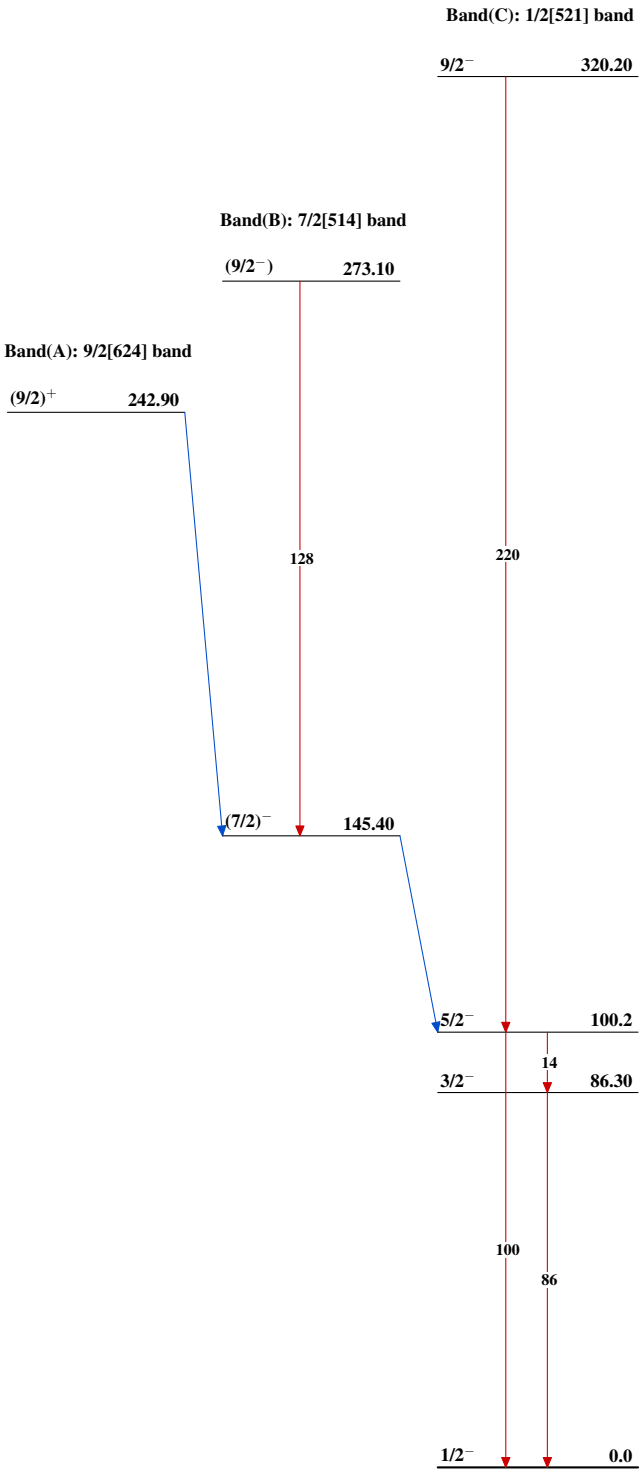


^{179}Ir ε decay 1992Bo19,2000Ro41



$^{179}_{76}Os_{103}$