

$^{174}\text{Yb}(^{19}\text{F},4n\gamma)$ [1992Bo23,1993Pe17](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, Balraj Singh		NDS 142, 1 (2017)	15-Apr-2017

Includes $^{181}\text{Ta}(^{12}\text{C},4n\gamma)$ from [1997Pe26](#).

[1992Bo23](#), [1993Pe17](#): $^{174}\text{Yb}(^{19}\text{F},4n)$, E=86-100 MeV; Chateau de Cristal array of 10 escape-suppressed Ge detectors, 26-74 BaF₂ scintillators; measured E γ , I γ , $\gamma\gamma$, DCO ratios. Both are brief reports with detailed level schemes and band structures but with no information about gamma-ray intensities, angular distributions or correlations.

[1997Pe26](#) (same group as [1992Bo23](#), [1993Pe17](#)): measured lifetime and g factor of isomers using the time differential perturbed angular distribution technique in $^{181}\text{Ta}(^{12}\text{C},4n\gamma)$, E=70 MeV reaction. Also [2001MaZN](#) (priv. comm.) from these authors.

 ^{189}Au Levels

E(level) [†]	J π [‡]	T _{1/2}	Comments
247.25 ^{& 16}	11/2 ^{- #}	4.59 [#] min 11	% ϵ +% β^+ $\approx$ 100; %IT=? Additional information 1. E(level): from Adopted Levels.
325.13 ^{@ 10}	9/2 ^{- #}	190 [#] ns 15	
646.2 ^{@ 8}	13/2 ⁻		
682.2 ^{& 10}	15/2 ⁻		
713.1 9	11/2 ⁻		
812.2 9	13/2 ⁻		
1097.1 13			
1105.2 ^{@ 13}	17/2 ⁻		
1130.1 11	(15/2 ⁻)		J π : 11/2 ⁻ in Adopted Levels.
1146.2 13			
1352.2 14			
1383.1 10	13/2 ⁺		
1412.2 ^{& 15}	19/2 ⁻		
1600.2 10			
1662.2 ^{@ 16}	21/2 ⁻		
1739.1 14	(17/2 ⁺)		J π : 13/2 ⁺ , 15/2 ⁺ in Adopted Levels.
1745.2 17			
2062.1 17	21/2 ⁺		
2205.5 ^{& 17}	23/2 ⁻		
2251.0 18	25/2 ⁺		
2299.2 ^{@ 19}	25/2 ⁻		
2400.9 18	25/2 ⁺		
2451.0 17			
2516.0 21	(27/2 ⁺)		
2543.0 21			
2554.8 ^{& 17}	(27/2 ⁻)		
2554.8+x ^a	31/2 ⁻	9 ns 2	Additional information 2. J π : (27/2 ⁻) in 1992Bo23 . T _{1/2} : from $\gamma(t)$ (1997Pe26).
2555.0 ^{b 23}	31/2 ⁺	242 ns 10	g=0.42 3 (1997Pe26) E(level): 2516.0+y, y=38.8 keV in 2001MaZN , 39 in 1997Pe26 . J π : (25/2 ⁺) in 1992Bo23 . T _{1/2} : from $\gamma(t)$ (1997Pe26).
2863.7+x 8	(33/2 ⁻)		J π : from Adopted Levels and level scheme consistency in 1993Pe17 . J π =(29/2 ⁻) in 1992Bo23 .
2929.0 25			
2968.2 22	(29/2 ⁻)		J π : from 1992Bo23 .
2989.9+x ^a 8	35/2 ⁻		J π : (31/2 ⁻) in 1992Bo23 .

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$^{174}\text{Yb}(^{19}\text{F},4n\gamma)$ **1992Bo23,1993Pe17 (continued)** ^{189}Au Levels (continued)

E(level) [†]	J ^π [‡]	Comments
3004.2 [@] 22	29/2 ⁻	
3062.0 ^b 25	35/2 ⁺	J ^π : (29/2 ⁺) in 1992Bo23 .
3162.1+x ^c 11		
3221.2 24		
3359.8+x 10	(37/2 ⁻)	J ^π : from Adopted Levels and level scheme consistency in 1993Pe17 . J ^π =(33/2 ⁻) in 1992Bo23 .
3553 3		E(level): this level corresponds to 3710 in Adopted Levels.
3560.9+x ^a 11	39/2 ⁻	J ^π : (35/2 ⁻) in 1992Bo23 .
3562 3	(37/2 ⁺)	J ^π : from Adopted Levels and level scheme consistency in 1993Pe17 . J ^π =(31/2 ⁺) in 1992Bo23 .
3839.5+x ^c 11		
3845 ^b 3	39/2 ⁺	J ^π : (33/2 ⁺) in 1992Bo23 .
3964.8+x 14		
4105.9+x 12	(41/2 ⁻)	J ^π : from Adopted Levels and level scheme consistency in 1993Pe17 . J ^π =(37/2 ⁻) in 1992Bo23 .
4200.8+x 17		E(level): this level corresponds to 4527+x in Adopted Levels.
4254.9+x ^a 15	43/2 ⁻	J ^π : (39/2 ⁻) in 1992Bo23 .
4290.8+x 17		
4325 3	(41/2 ⁺)	J ^π : from Adopted Levels and level scheme consistency in 1993Pe17 . J ^π =(35/2 ⁺) in 1992Bo23 .
4479 ^b 3	43/2 ⁺	J ^π : (37/2 ⁺) in 1992Bo23 .
4527.5+x ^c 15		
4675.5+x ^c 18		
4698 ^b 3	47/2 ⁺	J ^π : (41/2 ⁺) in 1992Bo23 ; (45/2 ⁻) in Adopted Levels.
4718.9+x 18		E(level): this level corresponds to 5368+x in Adopted Levels.
4797.9+x 18		E(level): this level corresponds to 6179 in Adopted Levels.
4878 3		
4904.9+x ^a 18	47/2 ⁻	
5173 3		
5315 ^b 3	51/2 ⁺	J ^π : (45/2 ⁺) in 1992Bo23 .
5429.5+x ^c 21		
5601 4		
5664 4		
5707.9+x ^a 21	51/2 ⁻	
5915 ^b 4	55/2 ⁺	E(level): this level corresponds to 6234 in Adopted Levels.
6234 ^b 4	57/2 ⁺	E(level),J ^π : this level corresponds to 5634, (53/2 ⁺) in Adopted Levels; ordering of the 319-600 γ cascade is reversed in $^{176}\text{Yb}(^{19}\text{F},6n\gamma)$ (1992Ve05) and in the Adopted dataset.
6305.9+x ^a 23	55/2 ⁻	
6307.5+x ^c 23		
7091 ^b 4	61/2 ⁺	
7955 ^b 4	65/2 ⁺	

[†] From least-squares fit to E γ values, assuming $\Delta(E\gamma)=1$ keV for each E γ .

[‡] The assignments from [1993Pe17](#) are given here when these differ from those in [1992Bo23](#).

From Adopted Levels.

@ Band(A): Prolate band based on 9/2⁻.

& Band(B): Oblate sequence based on 11/2⁻.

^a Band(C): Oblate sequence based on (31/2⁻).

^b Band(D): Oblate sequence based on 31/2⁺.

^c Band(E): γ cascade.

$^{174}\text{Yb}(^{19}\text{F},4n\gamma)$ **1992Bo23,1993Pe17** (continued)

$\gamma(^{189}\text{Au})$						
$E_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\alpha^\#$
Comments						
(x)	2554.8+x	31/2 ⁻	2554.8	(27/2 ⁻)		
38.8 3	2555.0	31/2 ⁺	2516.0	(27/2 ⁺)	[E2]	435 18
$\alpha(\text{L})=327\ 14; \alpha(\text{M})=84\ 4; \alpha(\text{N})=20.7\ 9; \alpha(\text{O})=3.28\ 14; \alpha(\text{P})=0.00288\ 12$						
$E_\gamma, \text{Mult.}$: from 2001MaZN , uncertainty assigned by the evaluators. Other: 39 keV (1997Pe26 in Fig. 1).						
E_γ : from Adopted Gammas.						
77.9 1	325.13	9/2 ⁻	247.25	11/2 ⁻		
104	2554.8	(27/2 ⁻)	2451.0			
126	2989.9+x	35/2 ⁻	2863.7+x	(33/2 ⁻)		
148	4675.5+x		4527.5+x			
150	2400.9	25/2 ⁺	2251.0	25/2 ⁺		
154	2554.8	(27/2 ⁻)	2400.9	25/2 ⁺		
154	4479	43/2 ⁺	4325	(41/2 ⁺)		
189	2251.0	25/2 ⁺	2062.1	21/2 ⁺		
201	3560.9+x	39/2 ⁻	3359.8+x	(37/2 ⁻)		
219	4698	47/2 ⁺	4479	43/2 ⁺		E_γ : 218 in 1997Pe13 .
236	4200.8+x		3964.8+x			
253	1383.1	13/2 ⁺	1130.1	(15/2 ⁻)		
253	3221.2		2968.2	(29/2 ⁻)		
265	2516.0	(27/2 ⁺)	2251.0	25/2 ⁺		
283	3845	39/2 ⁺	3562	(37/2 ⁺)		
292	2543.0		2251.0	25/2 ⁺		
299	3162.1+x		2863.7+x	(33/2 ⁻)		
309	2863.7+x	(33/2 ⁻)	2554.8+x	31/2 ⁻		
319 [‡]	6234	57/2 ⁺	5915	55/2 ⁺		
321	646.2	13/2 ⁻	325.13	9/2 ⁻		
326	4290.8+x		3964.8+x			
332	3553		3221.2			
349	2554.8	(27/2 ⁻)	2205.5	23/2 ⁻		
356	1739.1	(17/2 ⁺)	1383.1	13/2 ⁺		
370	3359.8+x	(37/2 ⁻)	2989.9+x	35/2 ⁻		
374	2929.0		2555.0	31/2 ⁺		
384	1097.1		713.1	11/2 ⁻		
388	713.1	11/2 ⁻	325.13	9/2 ⁻		
393	1745.2		1352.2			
399	4878		4479	43/2 ⁺		
428	5601		5173			
435	2989.9+x	35/2 ⁻	2554.8+x	31/2 ⁻		
435	682.2	15/2 ⁻	247.25	11/2 ⁻		E_γ : 434 in 1993Pe17 .
459	1105.2	17/2 ⁻	646.2	13/2 ⁻		
464	4718.9+x		4254.9+x	43/2 ⁻		
475	5173		4698	47/2 ⁺		
480	4325	(41/2 ⁺)	3845	39/2 ⁺		
484	1130.1	(15/2 ⁻)	646.2	13/2 ⁻		
491	5664		5173			
496	3359.8+x	(37/2 ⁻)	2863.7+x	(33/2 ⁻)		
500	1146.2		646.2	13/2 ⁻		
500	3562	(37/2 ⁺)	3062.0	35/2 ⁺		
507	3062.0	35/2 ⁺	2555.0	31/2 ⁺		
540	1352.2		812.2	13/2 ⁻		
543	4797.9+x		4254.9+x	43/2 ⁻		
545	4105.9+x	(41/2 ⁻)	3560.9+x	39/2 ⁻		
557	1662.2	21/2 ⁻	1105.2	17/2 ⁻		
565	812.2	13/2 ⁻	247.25	11/2 ⁻		
571	3560.9+x	39/2 ⁻	2989.9+x	35/2 ⁻		
598	6305.9+x	55/2 ⁻	5707.9+x	51/2 ⁻		E_γ : 600 in 1997Pe13 .

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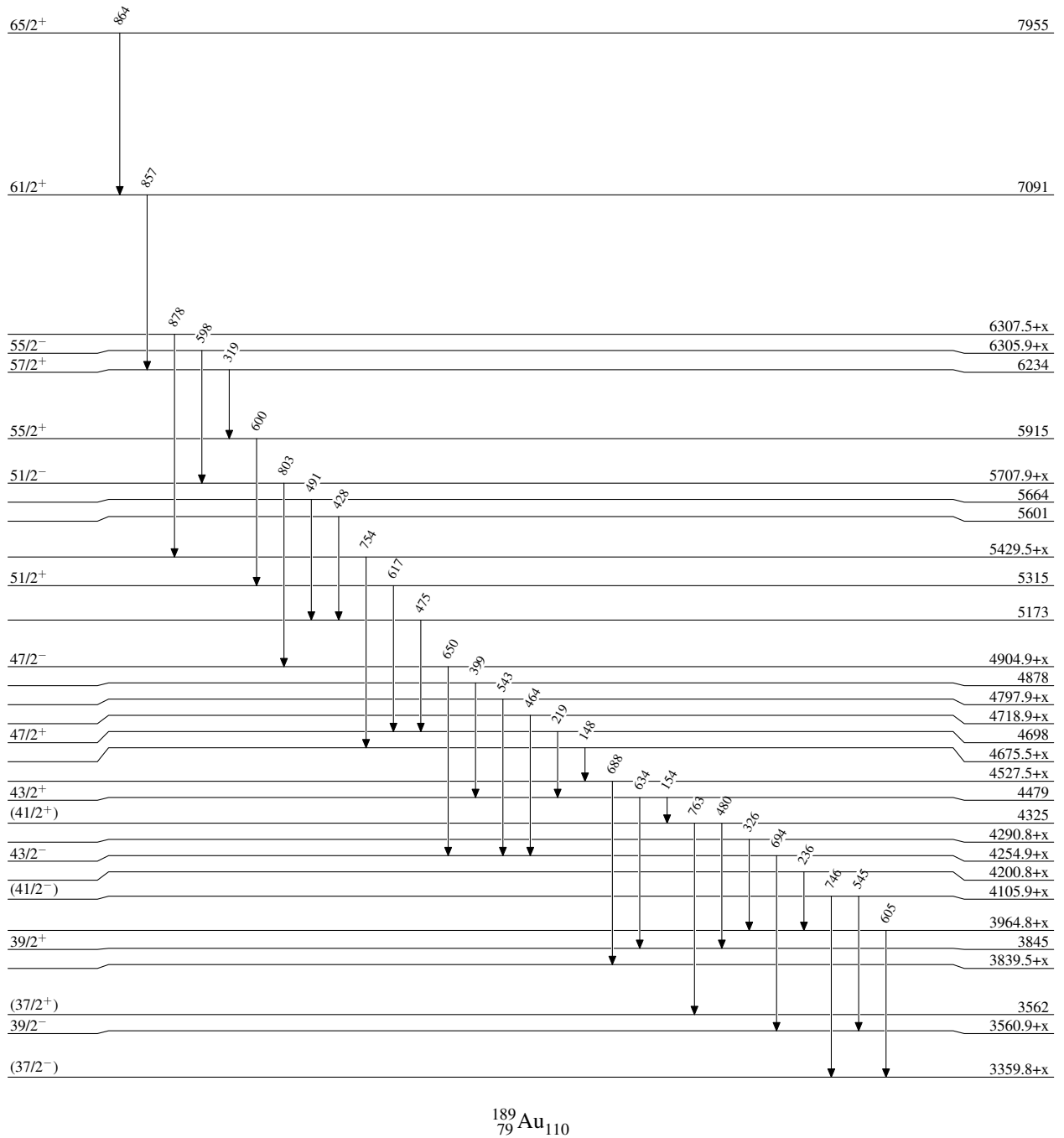
$^{174}\text{Yb}(^{19}\text{F},4n\gamma)$ **1992Bo23,1993Pe17** (continued) $\gamma(^{189}\text{Au})$ (continued)

$E_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	$E_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
600 ‡	5915	55/2 ⁺	5315	51/2 ⁺	737	1383.1	13/2 ⁺	646.2	13/2 ⁻
605	3964.8+x		3359.8+x	(37/2 ⁻)	746	4105.9+x	(41/2 ⁻)	3359.8+x	(37/2 ⁻)
617	5315	51/2 ⁺	4698	47/2 ⁺	754	5429.5+x		4675.5+x	
634	4479	43/2 ⁺	3845	39/2 ⁺	763	4325	(41/2 ⁺)	3562	(37/2 ⁺)
637	2299.2	25/2 ⁻	1662.2	21/2 ⁻	783	3845	39/2 ⁺	3062.0	35/2 ⁺
650	4904.9+x	47/2 ⁻	4254.9+x	43/2 ⁻	788	1600.2		812.2	13/2 ⁻
650	2062.1	21/2 ⁺	1412.2	19/2 ⁻	793	2205.5	23/2 ⁻	1412.2	19/2 ⁻
669	2968.2	(29/2 ⁻)	2299.2	25/2 ⁻	803	5707.9+x	51/2 ⁻	4904.9+x	47/2 ⁻
670	1383.1	13/2 ⁺	713.1	11/2 ⁻	849	3839.5+x		2989.9+x	35/2 ⁻
678	3839.5+x		3162.1+x		857	7091	61/2 ⁺	6234	57/2 ⁺
688	4527.5+x		3839.5+x		864	7955	65/2 ⁺	7091	61/2 ⁺
694	4254.9+x	43/2 ⁻	3560.9+x	39/2 ⁻	878	6307.5+x		5429.5+x	
705	3004.2	29/2 ⁻	2299.2	25/2 ⁻	954	1600.2		646.2	13/2 ⁻
730	1412.2	19/2 ⁻	682.2	15/2 ⁻	1039	2451.0		1412.2	19/2 ⁻

† From **1992Bo23** unless otherwise stated.

‡ **1992Ve05** in $^{176}\text{Yb}(^{19}\text{F},6n\gamma)$ propose a reversed ordering of the 319-600 cascade, thus giving a different energy and J^π for the intermediate level.

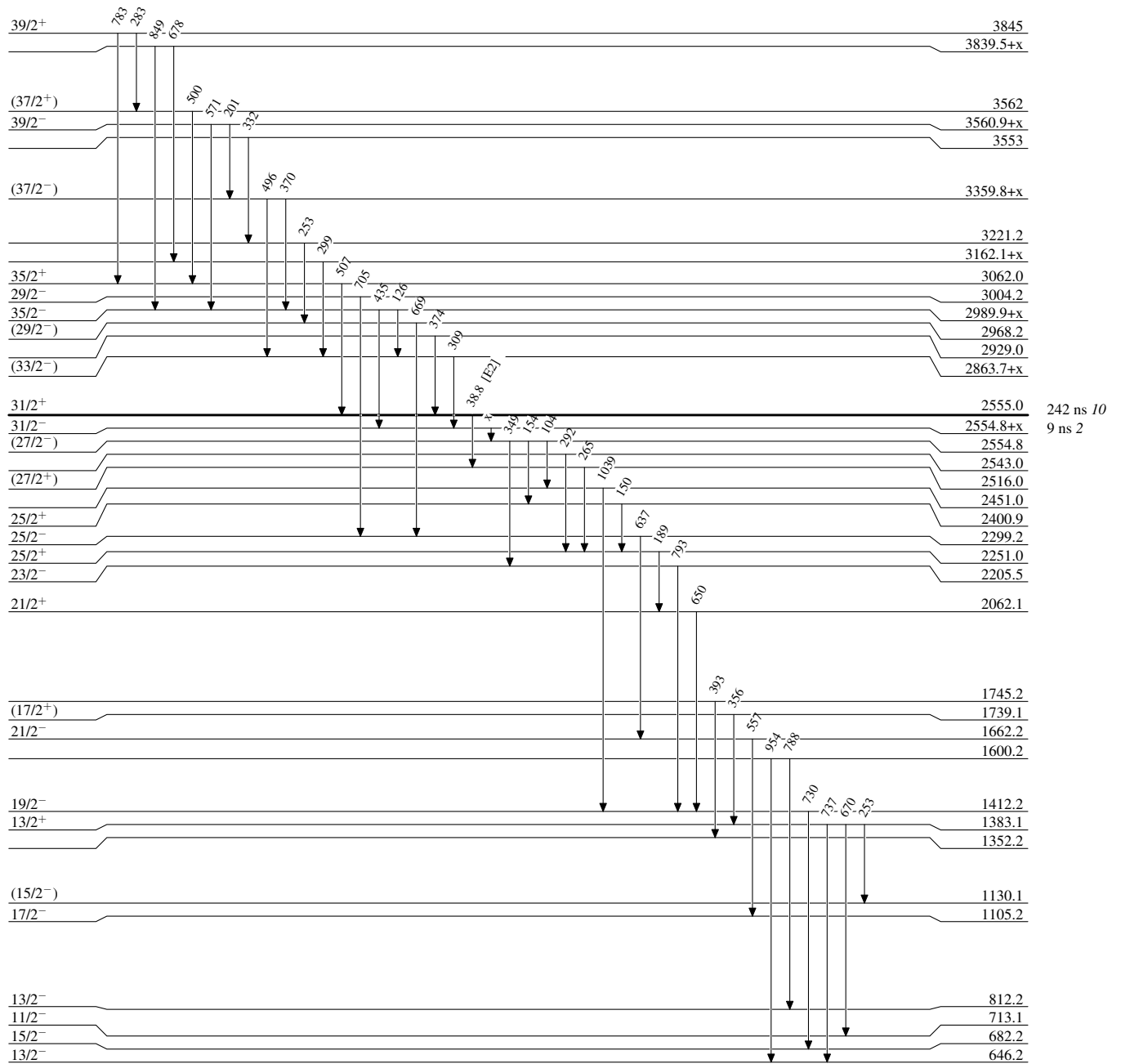
$^\#$ Total theoretical internal conversion coefficients, calculated using the BrIcc code (**2008Ki07**) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

$^{174}\text{Yb}(^{19}\text{F},4\text{n}\gamma)$ 1992Bo23,1993Pe17Level Scheme

$^{174}\text{Yb}(^{19}\text{F},4\text{n}\gamma)$ 1992Bo23,1993Pe17

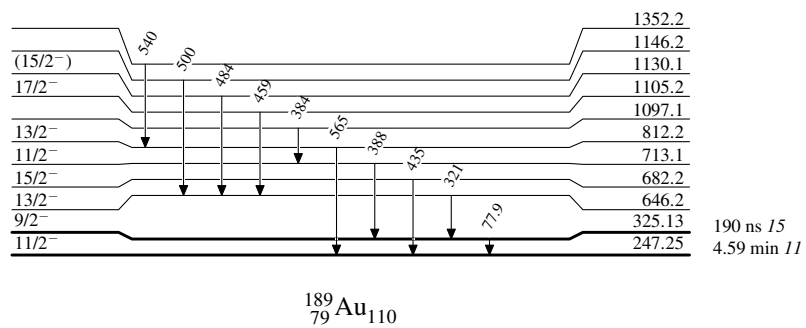
Legend

Level Scheme (continued)

-----► γ Decay (Uncertain) $^{189}_{79}\text{Au}_{110}$

$^{174}\text{Yb}(^{19}\text{F},4\text{n}\gamma)$ 1992Bo23,1993Pe17

Level Scheme (continued)



$^{189}_{79}\text{Au}_{110}$

$^{174}\text{Yb}(^{19}\text{F},4\text{n}\gamma) \quad 1992\text{Bo23},1993\text{Pe17}$ 