^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

Dataset based on unevaluated XUNDL file compiled by D. J. Hartley (U.S. Naval Academy) and B. Singh (McMaster) from 2010Wa37.

2010Wa37: E=90 MeV, measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using 12 Compton-suppressed HPGe detectors and one Clover detector at CIAE facility. Comparison with total Routhian surface calculations in the framework of cranked shell model using nonaxial deformed Woods-Saxon potential; with β_2, β_4 and γ deformation parameters.

1981PoZV,1982PoZX (same data): E=90 MeV, measured γ, $\gamma\gamma$, $\gamma(\theta)$, linear pol, yield, $\gamma\gamma(\theta)$ (DCO). Levels scheme (from 1982PoZX) is incompatible with that from 2010Wa37.

Data are from 2010Wa37 unless noted otherwise.

^{140}Pm Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0+x	8$^-$	5.95 min *5*	%ε+%β^+=100 E(level): x=431 *28* from Adopted Levels. $T_{1/2}$: from Adopted Levels. Configuration=$\pi d_{5/2}\otimes\nu_{11/2}$ (1993De40).
386.10+x *22*	8$^+$		
407.50+x[b] *21*	9$^+$		
532.3+x[b] *3*	10$^+$		
806.10+x[d] *21*	9$^-$		
934.1+x[b] *4*	11$^+$		
1301.2+x[d] *4*	11$^-$		
1308.1+x[b] *4*	12$^+$		
1689.5+x[#] *5*	12$^{(+)}$		
1872.8+x[b] *4*	13$^+$		
1948.1+x[#] *5*	12$^{(+)}$		
2096.4+x[d] *5*	13$^-$		
2208.6+x[#] *5*	12$^{(+)}$		
2265.5+x[#] *6*	13$^{(+)}$		
2331.7+x[b] *5*	14$^+$		
2353.9+x[#] *5*	14$^+$		
2443.6+x[#] *5*	12$^{(+)}$		
2556.3+x[#] *5*	14$^+$		
2570.0+x[#] *5*	14$^+$		
2594.6+x[#] *5*	13$^{(+)}$		
2624.3+x[e] *6*	14$^{(-)}$		
2663.8+x[#] *4*	13$^{(+)}$		
2746.9+x[c] *5*	15$^{(-)}$		
2776.7+x[#] *5*	13$^{(+)}$		
2829.2+x[d] *6*	15$^-$		
2904.3+x[#] *5*	14$^{(+)}$		
2987.8+x[a] *5*	14$^{(+)}$		
2991.6+x[c] *6*	16$^{(-)}$		
3131.2+x[&] *6*	15$^+$		
3285.2+x[a] *6*	15$^{(+)}$		
3371.6+x[e] *6*	16$^{(-)}$		

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^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV (continued)

^{140}Pm Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
3385.1+x& 6	$16^{(+)}$	3886.3+x[c] 6	$18^{(-)}$	4484.9+x@ 6	$18^{(-)}$	5018.6+x[e] 7	$20^{(-)}$
3497.5+x[c] 6	$17^{(-)}$	3934.2+x@ 7	$18^{(-)}$	4506.6+x& 6	$19^{(+)}$	5355.0+x& 7	$21^{(+)}$
3518.0+x[d] 6	17^{-}	4002.1+x[a] 7	$17^{(+)}$	4720.1+x@ 7	$20^{(-)}$	5524.0+x@ 8	$21^{(-)}$
3592.4+x@ 6	16^{-}	4041.6+x& 6	$18^{(+)}$	4863.3+x@ 7	$19^{(-)}$	5785.0+x@ 8	$21^{(-)}$
3609.3+x[a] 6	$16^{(+)}$	4127.0+x[e] 6	$18^{(-)}$	4955.2+x@ 7	$19^{(-)}$	5940.0+x& 7	$22^{(+)}$
3650.9+x& 6	$17^{(+)}$	4483.5+x[c] 6	$19^{(-)}$	5011.0+x& 7	$20^{(+)}$	6390.3+x@ 8	$23^{(-)}$

† From least-squares fit to Eγ data assuming 0.3 keV uncertainty for each Eγ.

‡ Adopted by 2010Wa37 using assigned multipolarities deduced configurations and systematics (can differ from J^{π} values in the Adopted Levels, Gammas dataset).

Possible member of a 4-qp configuration.

@ Possible member of a 6-qp configuration.

& Band(A): Band based on $15^{(+)}$. Possible 4-qp band, configuration=$\pi h_{11/2}\otimes\nu(f_{7/2},h^2_{11/2})$.

[a] Band(B): Band based on $14^{(+)}$. Possible 4-qp band, configuration=$\pi h_{11/2}\otimes\nu h^3_{11/2}$.

[b] Band(C): Probable $\pi h_{11/2}\otimes\nu h_{11/2}$ band. Assignment in 2010Wa37 based on systematics of other nuclei in this mass region.

[c] Band(D): Band based on $15^{(-)}$. Possible 4-qp configuration=$\pi 11/2[505]\otimes\nu(1/2[400],h^2_{11/2})$.

[d] Band(E): Possible $\pi h_{11/2}\otimes\nu 1/2[411]$.

[e] Band(F): Band based on $14^{(-)}$. Possible 4-qp band.

$\gamma(^{140}Pm)$

Linear pol P values and $\gamma(\theta)$ A_2, A_4 coefficients are from 1981PoZV and 1982PoZX.

DCO values (2010Wa37) correspond to gates on $\Delta J=1$ (mainly D) transitions. Expected ratios are 0.55 for stretched Q and 0.95 for stretched D. Dipole (M1) transitions can have quadrupole E2 admixtures that makes the DCO values more different from the expected DCO value of a pure dipole. Because of the heavy ion reaction population and the rotational character quadrupoles are very likely E2, while the admixed D+Q are tentatively M1+E2. Although it is more difficult to differentiate in between electric and magnetic chatacter for pure dipoles, in three such cases 2010Wa37 adopted tentatively E1 (level scheme or theoretical arguments are also explictly or implicitly implied by the authors).

E_γ	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
(21.4)		407.50+x	9^+	386.10+x	8^+		
124.8	74.5 *3*	532.3+x	10^+	407.50+x	9^+	M1+E2	DCO=0.89 *4*
127.6	0.91 *22*	2904.3+x	$14^{(+)}$	2776.7+x	$13^{(+)}$		
176.9	13.4 *9*	2746.9+x	$15^{(-)}$	2570.0+x	14^+	[E1]	DCO=0.96 *7* Mult.: relatively pure stretched D, $\Delta\pi$=yes E1 based on proposed configuration (2010Wa37).
190.6	3.2 *3*	2746.9+x	$15^{(-)}$	2556.3+x	14^+	[E1]	DCO=0.88 *9* Mult.: relatively pure stretched D, $\Delta\pi$=yes E1 based on proposed configuration (2010Wa37).
220.2	1.0 *2*	2663.8+x	$13^{(+)}$	2443.6+x	$12^{(+)}$		
220.8	0.86 *17*	3592.4+x	16^{-}	3371.6+x	$16^{(-)}$		
226.9	25.7 *3*	3131.2+x	15^+	2904.3+x	$14^{(+)}$	(M1+E2)	DCO=0.89 *5*
240.5	1.1 *3*	2904.3+x	$14^{(+)}$	2663.8+x	$13^{(+)}$	(M1+E2)	DCO=0.93 *10*
244.7	10.8 *11*	2991.6+x	$16^{(-)}$	2746.9+x	$15^{(-)}$	(M1+E2)	DCO=0.99 *6*
253.9	35.6 *3*	3385.1+x	$16^{(+)}$	3131.2+x	15^+	(M1+E2)	DCO=0.86 *4*

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^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV (continued)

γ(^{140}Pm) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	Comments
								A_2=−0.49 *6*, A_4=+0.08 *8*, P=−0.40 *18* (1981PoZV,1982PoZX).
265.8	26.8 *12*	3650.9+x	$17^{(+)}$	3385.1+x	$16^{(+)}$	(M1+E2)		DCO=0.91 *4* A_2=−0.35 *6*, A_4=+0.01 *7* (1981PoZV,1982PoZX).
273.8	6.1 *2*	806.10+x	9^-	532.3+x	10^+	D		DCO=1.02 *10*
297.4	0.70 *14*	3285.2+x	$15^{(+)}$	2987.8+x	$14^{(+)}$	(M1+E2)		DCO=1.05 *12*
309.7	0.95 *16*	2904.3+x	$14^{(+)}$	2594.6+x	$13^{(+)}$	(M1+E2)		DCO=0.88 *10*
324.0	<0.1	2987.8+x	$14^{(+)}$	2663.8+x	$13^{(+)}$			
324.1	0.56 *15*	3609.3+x	$16^{(+)}$	3285.2+x	$15^{(+)}$			
344.0	2.3 *3*	5355.0+x	$21^{(+)}$	5011.0+x	$20^{(+)}$	(M1+E2)		DCO=0.84 *16*
374.0	37.3 *11*	1308.1+x	12^+	934.1+x	11^+	M1(+E2)	+0.08 *10*	DCO=1.06 *5* A_2=−0.37 *4*, A_4=+0.03 *3*, P=−0.36 *17* (1981PoZV,1982PoZX).
386.0	1.5 *3*	2594.6+x	$13^{(+)}$	2208.6+x	$12^{(+)}$			
386.1	100.0 *2*	386.10+x	8^+	0.0+x	8^-	E1		A_2=+0.39 *3*, A_4=+0.05 *3*, P=−0.71 10 (1981PoZV,1982PoZX). Mult.: ΔJ=0 E1 (M1+E2 with δ=−0.45 10 is also listed by 1981PoZV and 1982PoZX).
388.8	4.2 *4*	3886.3+x	$18^{(-)}$	3497.5+x	$17^{(-)}$			
390.7	24.5 *12*	4041.6+x	$18^{(+)}$	3650.9+x	$17^{(+)}$	(M1+E2)		DCO=0.93 *5* A_2=−0.32 *7*, A_4=+0.08 *8* (1981PoZV,1982PoZX).
392.8	0.40 *12*	4002.1+x	$17^{(+)}$	3609.3+x	$16^{(+)}$			
398.6	2.5 *4*	806.10+x	9^-	407.50+x	9^+			
401.8	68.6 *5*	934.1+x	11^+	532.3+x	10^+	M1(+E2)	+0.07 *4*	DCO=1.07 *4* A_2=−0.38 *2*, A_4=+0.02 *3*, P=−0.30 *15* (1981PoZV,1982PoZX).
407.5	26.5 *3*	407.50+x	9^+	0.0+x	8^-	E1		DCO=0.90 *8* A_2=−0.21 *5*, A_4=+0.06 *4*, P=+0.46 *15* (1981PoZV,1982PoZX). Mult.: in 2010Wa37 while this is a dipole with parity changing transition, so E1, in Table 2 (level scheme assigned data) the noted multipolarity is M1+E2.
416.2	2.5 *4*	3934.2+x	$18^{(-)}$	3518.0+x	17^-	(M1+E2)		DCO=0.84 *10*
420.0	8.0 *9*	806.10+x	9^-	386.10+x	8^+			
455.2	2.1 *3*	2663.8+x	$13^{(+)}$	2208.6+x	$12^{(+)}$	(M1+E2)		DCO=1.29 *25*
458.9	2.2 *2*	2331.7+x	14^+	1872.8+x	13^+	(M1+E2)		DCO=1.17 *17*
465.0	17.2 *10*	4506.6+x	$19^{(+)}$	4041.6+x	$18^{(+)}$	(M1+E2)		DCO=0.90 *7* A_2=−0.08 *5*, A_4=−0.02 *5* (1981PoZV,1982PoZX).
495.1	31.4 *3*	1301.2+x	11^-	806.10+x	9^-	E2		DCO=0.48 *4* A_2=+0.24 *6*, A_4=−0.02 *5*, P=+0.06 *25* (1981PoZV,1982PoZX).
504.4	10.5 *8*	5011.0+x	$20^{(+)}$	4506.6+x	$19^{(+)}$	(M1+E2)		DCO=0.89 *11*
505.4	2.0 *3*	5524.0+x	$21^{(-)}$	5018.6+x	$20^{(-)}$	(M1+E2)		DCO=1.0 *4*
505.9	7.6 *6*	3497.5+x	$17^{(-)}$	2991.6+x	$16^{(-)}$	(M1+E2)		DCO=0.97 *11*
519.7	1.5 *4*	3650.9+x	$17^{(+)}$	3131.2+x	15^+	E2		DCO=0.64 *11*
527.9	16.2 *10*	2624.3+x	$14^{(-)}$	2096.4+x	13^-	(M1+E2)		DCO=0.98 *11* A_2=−0.30 *5*, A_4=+0.09 *4*, P=+0.20 *3* (1981PoZV,1982PoZX). Mult.: M1+E2 adopted by 1982PoZX and 2010Wa37 (1982PoZX did not exclude E1).

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^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV (continued)

$\gamma(^{140}Pm)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	Comments
534.6	0.70 *19*	4127.0+x	$18^{(-)}$	3592.4+x	16^-			
564.7	20.2 *10*	1872.8+x	13^+	1308.1+x	12^+	M1+E2	+0.13 *6*	DCO=1.04 *6* Mult.: A_2=−0.49 *10*, A_4=+0.10 *10*, P=−0.20 *21* (1981PoZV, 1982PoZX).
576.0	2.9 *3*	2265.5+x	$13^{(+)}$	1689.5+x	$12^{(+)}$	(M1+E2)		DCO=1.24 *18*
585.0	0.70 *21*	5940.0+x	$22^{(+)}$	5355.0+x	$21^{(+)}$			
593.1	<0.1	4720.1+x	$20^{(-)}$	4127.0+x	$18^{(-)}$			
597.2	3.9 *5*	4483.5+x	$19^{(-)}$	3886.3+x	$18^{(-)}$	(M1+E2)		DCO=1.23 *11*
656.5	0.57 *14*	4041.6+x	$18^{(+)}$	3385.1+x	$16^{(+)}$			
688.8	4.4 *9*	3518.0+x	17^-	2829.2+x	15^-	E2		DCO=0.51 *10*
697.2	10.1 *7*	2570.0+x	14^+	1872.8+x	13^+	(M1+E2)		DCO=1.09 *9* A_2=−0.22 *10*, A_4=−0.01 *10* (1981PoZV,1982PoZX).
732.8	5.5 *6*	2829.2+x	15^-	2096.4+x	13^-	E2		DCO=0.52 *13*
736.3	1.3 *7*	4863.3+x	$19^{(-)}$	4127.0+x	$18^{(-)}$	(M1+E2)		DCO=0.96 *22*
747.3	11.9 *11*	3371.6+x	$16^{(-)}$	2624.3+x	$14^{(-)}$	E2		DCO=0.52 *7* A_2=+0.33 *8*, A_4=+0.07 *8* (1981PoZV,1982PoZX).
750.6	0.8 *3*	3497.5+x	$17^{(-)}$	2746.9+x	$15^{(-)}$			
755.4[#]	18.7[#] *10*	1689.5+x	$12^{(+)}$	934.1+x	11^+	(M1+E2)		DCO=1.10 *7* Mult.: for the resolved doublet 755.4γ+755.4γ in 2010Wa37, 1982PoZX and 1981PoZV found A_2=−0.14 *4*, A_4=+0.06 *1*, P=−0.39 *23* as for a singlet. (M1+E2) adopted by 2010Wa37 for this stronger component seems sustained by 1982PoZX and 1981PoZV $\gamma(\theta)$ and linear pol data (for the weaker component 2010Wa37 adopted E2).
755.4[#]	7.6[#] *7*	4127.0+x	$18^{(-)}$	3371.6+x	$16^{(-)}$	E2		DCO=0.46 *11*
775.8	16.5 *8*	1308.1+x	12^+	532.3+x	10^+	E2		DCO=0.51 *5*
785.9	1.9 *4*	4720.1+x	$20^{(-)}$	3934.2+x	$18^{(-)}$	E2		DCO=0.63 *12*
795.2	24.2 *22*	2096.4+x	13^-	1301.2+x	11^-	E2		DCO=0.52 *6* A_2=+0.34 *5*, A_4=+0.02 *5*, P=+0.35 (1981PoZV,1982PoZX).
806.1	4.4 *6*	806.10+x	9^-	0.0+x	8^-			Mult.: while this is a dipole with no parity changing transition, so M1(+E2), in Table 2 (level scheme assigned data) the noted multipolarity is E1 (2010Wa37).
828.2	1.6 *8*	4955.2+x	$19^{(-)}$	4127.0+x	$18^{(-)}$	(M1+E2)		DCO=0.82 *14*
848.4	<0.1	5355.0+x	$21^{(+)}$	4506.6+x	$19^{(+)}$			
855.7	1.2 *2*	4506.6+x	$19^{(+)}$	3650.9+x	$17^{(+)}$			
866.3	1.6 *4*	6390.3+x	$23^{(-)}$	5524.0+x	$21^{(-)}$	E2		DCO=0.44 *20*
891.6	2.6 *4*	5018.6+x	$20^{(-)}$	4127.0+x	$18^{(-)}$	E2		DCO=0.44 *13*
892.5	0.24 *9*	4484.9+x	$18^{(-)}$	3592.4+x	16^-	E2		
894.7	2.8 *4*	3886.3+x	$18^{(-)}$	2991.6+x	$16^{(-)}$	E2		DCO=0.49 *7*
905.1	2.1 *3*	2594.6+x	$13^{(+)}$	1689.5+x	$12^{(+)}$	(M1+E2)		DCO=0.84 *17*
921.7	0.23 *8*	5785.0+x	$21^{(-)}$	4863.3+x	$19^{(-)}$			
938.7	2.4 *6*	1872.8+x	13^+	934.1+x	11^+	E2		DCO=0.45 *10*
[x]958.9 *2*	6 *1*							E_γ: seen only in 1981PoZV and 1982PoZX in coin with 565.0γ.
966.9	1.2 *3*	4484.9+x	$18^{(-)}$	3518.0+x	17^-	(M1+E2)		DCO=1.01 *18*

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^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV (continued)

$\gamma(^{140}Pm)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
969.4	1.6 *7*	5011.0+x	$20^{(+)}$	4041.6+x	$18^{(+)}$		
974.3	5.1 *7*	2663.8+x	$13^{(+)}$	1689.5+x	$12^{(+)}$	(M1+E2)	DCO=0.98 *10*
986.0	0.5 *3*	4483.5+x	$19^{(-)}$	3497.5+x	$17^{(-)}$		
1014.0	3.4 *7*	1948.1+x	$12^{(+)}$	934.1+x	11^+	(M1+E2)	DCO=0.85 *16*
1023.6	1.1 *5*	2331.7+x	14^+	1308.1+x	12^+	E2	DCO=0.49 *11*
1045.8	8.2 *7*	2353.9+x	14^+	1308.1+x	12^+	E2	DCO=0.48 *6*
1115.0	1.4 *3*	2987.8+x	$14^{(+)}$	1872.8+x	13^+		
1248.2	7.8 *7*	2556.3+x	14^+	1308.1+x	12^+	E2	DCO=0.52 *7*
1261.9	6.1 *8*	2570.0+x	14^+	1308.1+x	12^+	E2	DCO=0.40 *7*
1274.5	5.5 *9*	2208.6+x	$12^{(+)}$	934.1+x	11^+	(M1+E2)	DCO=1.15 *13*
1468.6	4.2 *5*	2776.7+x	$13^{(+)}$	1308.1+x	12^+	(M1+E2)	DCO=0.80 *14*
1509.5	0.9 *4*	2443.6+x	$12^{(+)}$	934.1+x	11^+	(M1+E2)	DCO=1.0 *4*

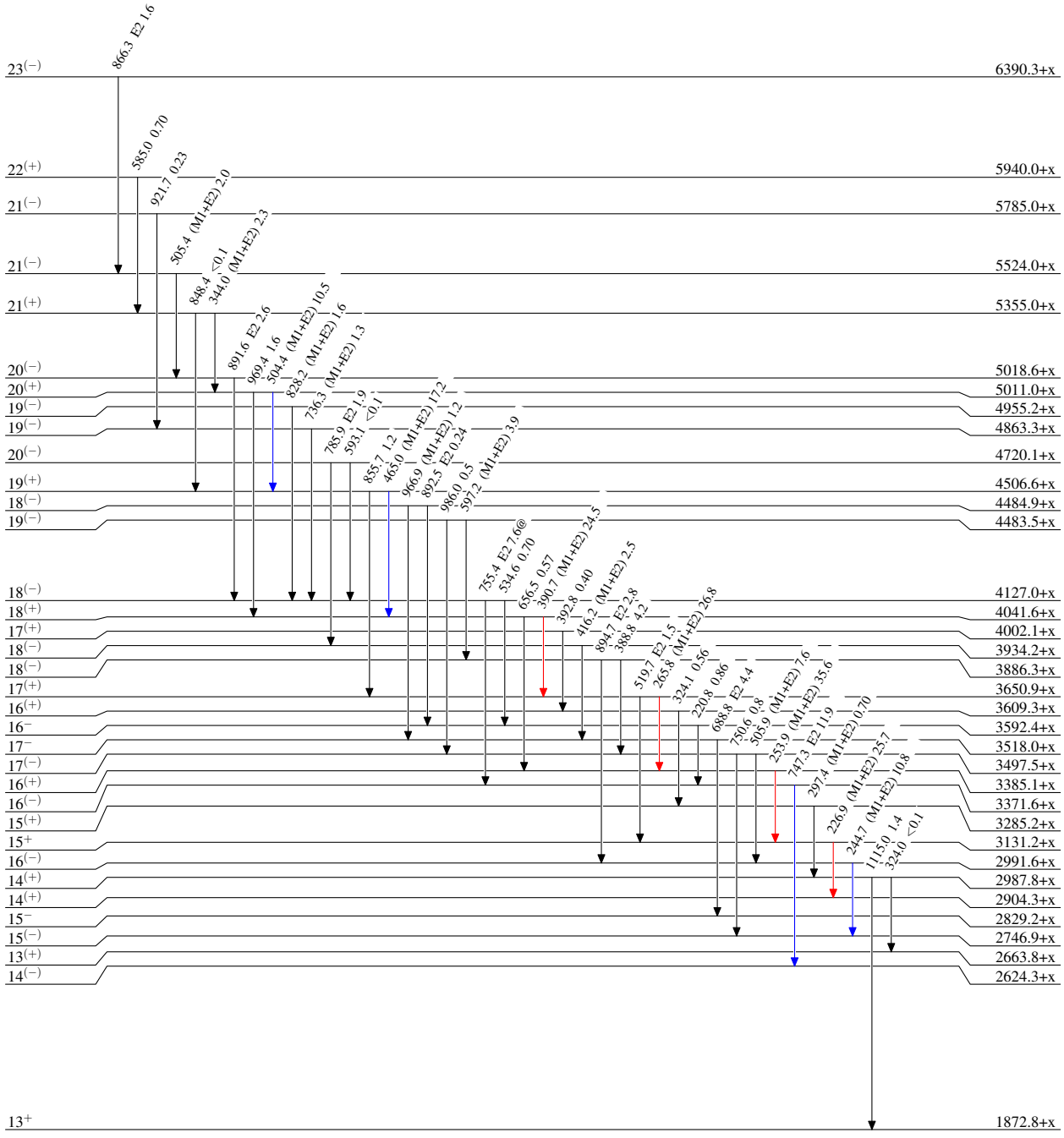
[†] From DCO ratios (2010Wa37), $\gamma(\theta)$, and linear pol (1981PoZV and 1982PoZX).
[‡] From 1982PoZX.
[#] Multiply placed with intensity suitably divided.
[x] γ ray not placed in level scheme.

^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV

Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



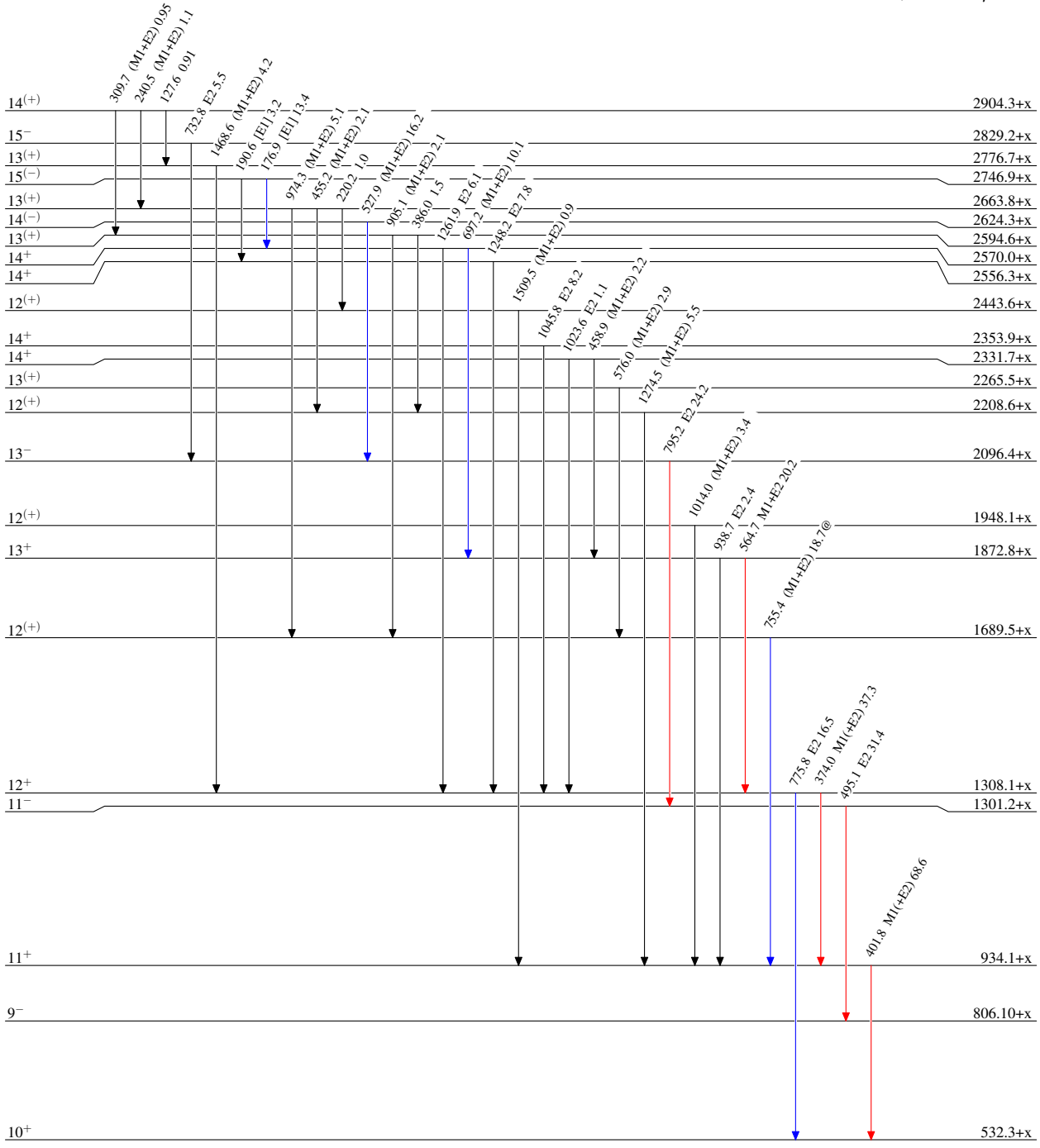
$^{140}_{61}Pm_{79}$

^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV

Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{140}_{61}Pm_{79}$

^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV

Level Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

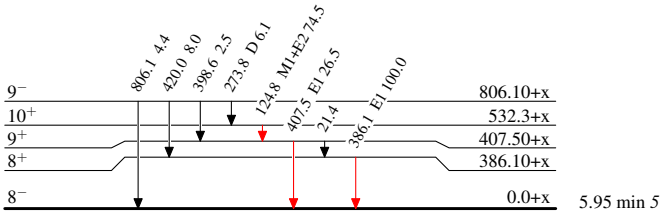
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

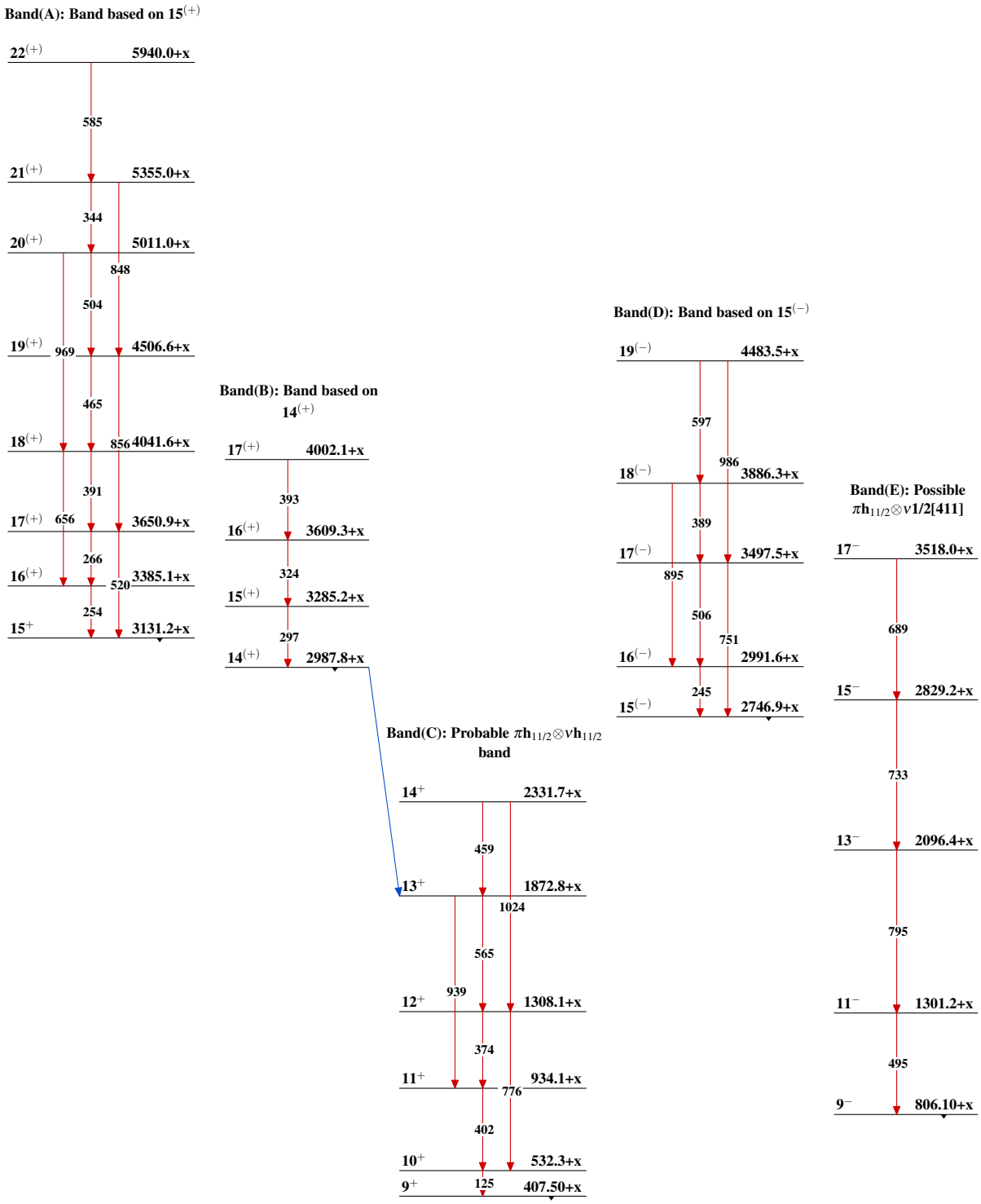
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



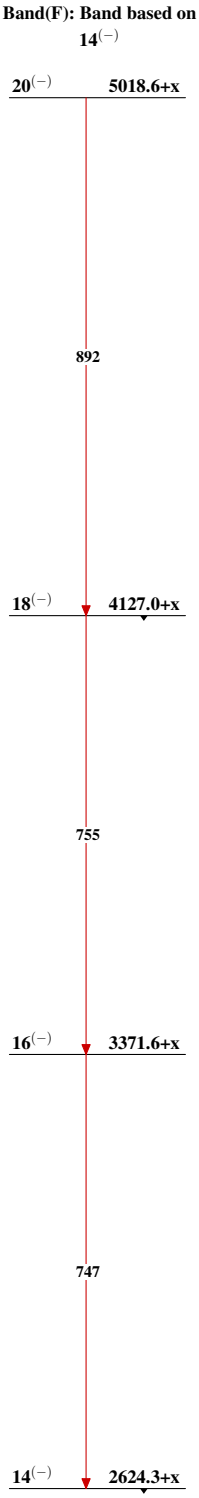
$^{140}_{61}Pm_{79}$

^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV



$^{140}_{61}Pm_{79}$

^{126}Te(^{19}F,5nγ) 2010Wa37,1982PoZX,1981PoZV (continued)



$^{140}_{61}Pm_{79}$