Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 122, 205 (2014)	1-Feb-2014

Q(β^-)=−1139 *21*; S(n)=6983 *8*; S(p)=4391.8 *9*; Q(α)=5194.0 *15* 2012Wa38

Other reactions:
^{235}U(p,nf), ^{235}U(d,2nf) (1998Er01,1997Er09). Other: 1995Da18.
^{236}U(p,2n), ^{237}Np(^{3}He,2np) (1996Aa03).
^{238}U(p,4n) (1994Be52).
^{235}U(d,2n) (1993Be64).

^{235}Np Levels

Cross Reference (XREF) Flags

A	^{235}Pu ε decay	D	^{237}Np(p,t)
B	^{239}Am α decay	E	^{237}Np(^{116}Sn,^{118}Snγ)
C	^{234}U(^{3}He,d),(α,t)		

E(level)	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0#	5/2$^+$	396.1 d *12*	ABCDE	%ε=99.99740 *13*; %α=0.00260 *13* $T_{1/2}$: from 1970La08. Other values: 410 d *10* (1952Ja01), 403 d (1958Gi05). %α from measurements of x-rays from ^{235}Np and ^{236}Np ε decay, and alpha particles from ^{237}Np α decay (1986AgZV). %α=0.0035 *4* from Iα/K x ray+L x ray (it is not clear whether this result had been corrected for M+ electron capture) (1956Ho46). %α=0.0012 *1* unpublished results (1957Th37). %α=0.00159 from Iα/K x ray+L x ray, after correcting for εM+/εL=0.46 (1958Gi05). %$\alpha\approx$0.002 from K x ray/Iα (1984Wh02). J$^\pi$: L(p,t)=0.
34.23@ *10*	(7/2)$^+$		A DE	J$^\pi$: L=2 in (p,t); rotational parameter; 34.2γ (M1+E2) to 5/2$^+$.
49.10a *10*	(5/2)$^-$	6.9 ns *3*	ABC	J$^\pi$: HF=1.4 for α decay from (5/2)$^-$, Nilsson band systematics (1972El21). $T_{1/2}$: K x ray-49γ(t) delayed coincidence in ^{235}Pu ε decay (1971Go01).
79.1# *4*	(9/2$^+$)		A CDE	J$^\pi$: rotational parameter.
91.6a *3*	(7/2)$^-$		B	J$^\pi$: favored rotational band in ^{239}Am (J$^\pi$=(5/2)$^-$) α decay.
133@ *2*	(11/2)$^+$		DE	J$^\pi$: L=4 in (p,t); rotational parameter.
146.8a *7*	(9/2)$^-$		BC	J$^\pi$: favored rotational band in ^{239}Am (J$^\pi$=(5/2)$^-$) α decay.
206.2# *10*	(13/2)$^+$		CDE	J$^\pi$: L=4 in (p,t); rotational parameter.
276.4@ *10*	(15/2$^+$)		E	
352b *2*	(3/2$^-$)†		C	
359.9# *15*	(17/2$^+$)		E	
371?b *3*	(1/2$^-$)†		C	
408b *2*	(7/2$^-$)†		C	
441b *3*	(5/2$^-$)†		C	
463.0@ *15*	(19/2$^+$)		E	
520b *1*	(11/2$^-$)†		C	J$^\pi$: in analogy with ^{237}Np.
560.4# *18*	(21/2$^+$)		E	
565c *1*	(3/2$^-$)†		C	
602c *3*	(5/2$^-$)†		C	
644c *1*	(7/2$^-$)†		C	J$^\pi$: suggested by large cross sections in (^{3}He,d) and (α,t).
≈681			C	

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Adopted Levels, Gammas (continued)

^{235}Np Levels (continued)

E(level)	J^{π}‡	XREF	Comments
690.4@ *18*	(23/2$^+$)	E	
700[c] *3*	(9/2$^-$)†	C	
756.4 *3*	(3/2$^+$,5/2,7/2)	A	J^{π}: log *ft*=6.3 from ^{235}Pu (J^{π}=(5/2$^+$)) ε decay, γ to (7/2)$^+$.
761[c] *2*	(11/2$^-$)†	C	
779.5 *2*	(3/2$^+$,5/2,7/2)	A	J^{π}: log *ft*=6.8 from ^{235}Pu (J^{π}=(5/2$^+$)) ε decay, γ to (7/2)$^+$.
806.3# *20*	(25/2$^+$)	E	
819.0 *4*	(5/2$^+$,7/2)	A C	J^{π}: log *ft*=7.5 from ^{235}Pu (J^{π}=(5/2$^+$)) ε decay. γ ray to (9/2$^+$).
834 *4*	5/2$^+$	D	J^{π}: L=0 in (p,t); pairing excitation state (1974Fr01).
870 *3*		C	
922 *1*	(7/2$^-$)†&	C	
936.8 *3*	(5/2$^+$,7/2)	A	J^{π}: log *ft*=6.6 from ^{235}Pu (J^{π}=(5/2$^+$)) ε decay. γ ray to (9/2$^+$).
944.5 *2*	(3/2$^+$,5/2,7/2)	A	J^{π}: log *ft*=5.7 from ^{235}Pu (J^{π}=(5/2$^+$)) ε decay, γ to (7/2)$^+$.
956.1@ *20*	(27/2$^+$)	E	
962 *2*		D	
978 *1*	(9/2$^-$)†&	C	
998 *1*		D	
1024 *1*		CD	
1064 *2*	(9/2$^-$)†&	C	
1088.9# *23*	(29/2$^+$)	E	
1117 *3*		C	
1160[d] *2*	(13/2$^+$)†	C	
1227 *3*		C	
1256.1@ *23*	(31/2$^+$)	E	
1260 *2*	5/2$^+$	CD	J^{π}: L=0 in (p,t).
1293 *6*		D	
1310 *2*		C	
1364 *2*		C	
1405.3# *25*	(33/2$^+$)	E	
1510 *2*		C	
1588.0@ *25*	(35/2$^+$)	E	
1607 *2*		C	
1675 *4*		C	
1696 *2*		C	
1752# *3*	(37/2$^+$)	E	
1818 *2*	5/2$^+$	D	J^{π}: L=0 in (p,t).
1845 *3*	(7/2$^-$)	C	
1918 *4*		C	
1948@ *3*	(39/2$^+$)	E	
2050 *5*		C	
2124# *3*	(41/2$^+$)	E	
2336@ *3*	(43/2$^+$)	E	
2526# *3*	(45/2$^+$)	E	
2751@ *3*	(47/2$^+$)	E	
2952# *4*	(49/2$^+$)	E	
3191?@ *4*	(51/2$^+$)	E	
3401?# *4*	(53/2$^+$)	E	

† From (^{3}He,α) based on transferred L-values, systematics of Nilsson configuration assignments, and reaction cross sections.

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Adopted Levels, Gammas (continued)

^{235}Np Levels (continued)

‡ For members of 5/2+[642] bands J^π are from 2010Hu02, based on the assumption of $\pi i_{13/2}$ orbital and comparison with the g.s. and assignments in ^{237}Np. 2010Hu02 point out that $\pi h_{9/2}$, 5/2[523] assignment, thus a negative-parity sequence cannot be ruled out.
# Band(A): 5/2[642], α=+1/2. The $\pi h_{9/2}$, 5/2[523] assignment is also possible (2010Hu02).
@ Band(a): 5/2[642], α=−1/2. The $\pi h_{9/2}$, 5/2[523] assignment is also possible (2010Hu02).
& configuration=7/2[514]?
a Band(B): 5/2[523].
b Band(C): 1/2[530].
c Band(D): 3/2[521].
d Band(E): 7/2[633]?

$\gamma(^{235}Np)$

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π	Mult.‡	α†	Comments
34.23	$(7/2)^+$	34.23 *10*	100	0	$5/2^+$	[M1+E2]	1.3×10^3 *12*	α(L)=1.0×10^3 *9*; α(M)=2.6×10^2 *24*; α(N+..)=9.E1 9 α(N)=7.E1 7; α(O)=17 *16*; α(P)=2.7 *25*; α(Q)=0.016 *6*
49.10	$(5/2)^-$	49.10 *10*	100	0	$5/2^+$	E1	0.833 *13*	α(L)=0.624 *10*; α(M)=0.1559 *24*; α(N+..)=0.0525 *8* α(N)=0.0414 *7*; α(O)=0.00953 *15*; α(P)=0.001529 *23*; α(Q)=5.38×10^{-5} *8*
79.1	$(9/2^+)$	78#	100	0	$5/2^+$			
133	$(11/2)^+$	101#	100	34.23	$(7/2)^+$			
206.2	$(13/2)^+$	127.1 *10*	100	79.1	$(9/2^+)$			
276.4	$(15/2^+)$	143.4 *10*	100	133	$(11/2)^+$			
359.9	$(17/2^+)$	153.7 *10*	100	206.2	$(13/2)^+$			
463.0	$(19/2^+)$	186.6 *10*	100	276.4	$(15/2^+)$			
560.4	$(21/2^+)$	200.5 *10*	100	359.9	$(17/2^+)$			
690.4	$(23/2^+)$	227.4 *10*	100	463.0	$(19/2^+)$			
756.4	$(3/2^+,5/2,7/2)$	722.2 *5*	1.0 *3*	34.23	$(7/2)^+$			
		756.4 *3*	100 *4*	0	$5/2^+$			
779.5	$(3/2^+,5/2,7/2)$	745.1 *3*	100 *9*	34.23	$(7/2)^+$			
		779.6 *3*	41 *4*	0	$5/2^+$			
806.3	$(25/2^+)$	245.9 *10*	100	560.4	$(21/2^+)$			
819.0	$(5/2^+,7/2)$	739.8 *4*	100 *20*	79.1	$(9/2^+)$			
		785.0 *4*	60 *20*	34.23	$(7/2)^+$			
936.8	$(5/2^+,7/2)$	858.0 *5*	60 *20*	79.1	$(9/2^+)$			
		902.6 *4*	100 *13*	34.23	$(7/2)^+$			
		936.7 *4*	60 *20*	0	$5/2^+$			
944.5	$(3/2^+,5/2,7/2)$	910.1 *3*	100 *3*	34.23	$(7/2)^+$			
		944.7 *3*	69 *3*	0	$5/2^+$			
956.1	$(27/2^+)$	265.7 *10*	100	690.4	$(23/2^+)$			
1088.9	$(29/2^+)$	282.6 *10*	100	806.3	$(25/2^+)$			
1256.1	$(31/2^+)$	300.0 *10*	100	956.1	$(27/2^+)$			
1405.3	$(33/2^+)$	316.4 *10*	100	1088.9	$(29/2^+)$			
1588.0	$(35/2^+)$	331.9 *10*	100	1256.1	$(31/2^+)$			
1752	$(37/2^+)$	346.3 *10*	100	1405.3	$(33/2^+)$			
1948	$(39/2^+)$	360.4 *10*	100	1588.0	$(35/2^+)$			
2124	$(41/2^+)$	372.4 *10*	100	1752	$(37/2^+)$			
2336	$(43/2^+)$	387.8 *10*	100	1948	$(39/2^+)$			

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Adopted Levels, Gammas (continued)

$\gamma(^{235}Np)$ (continued)

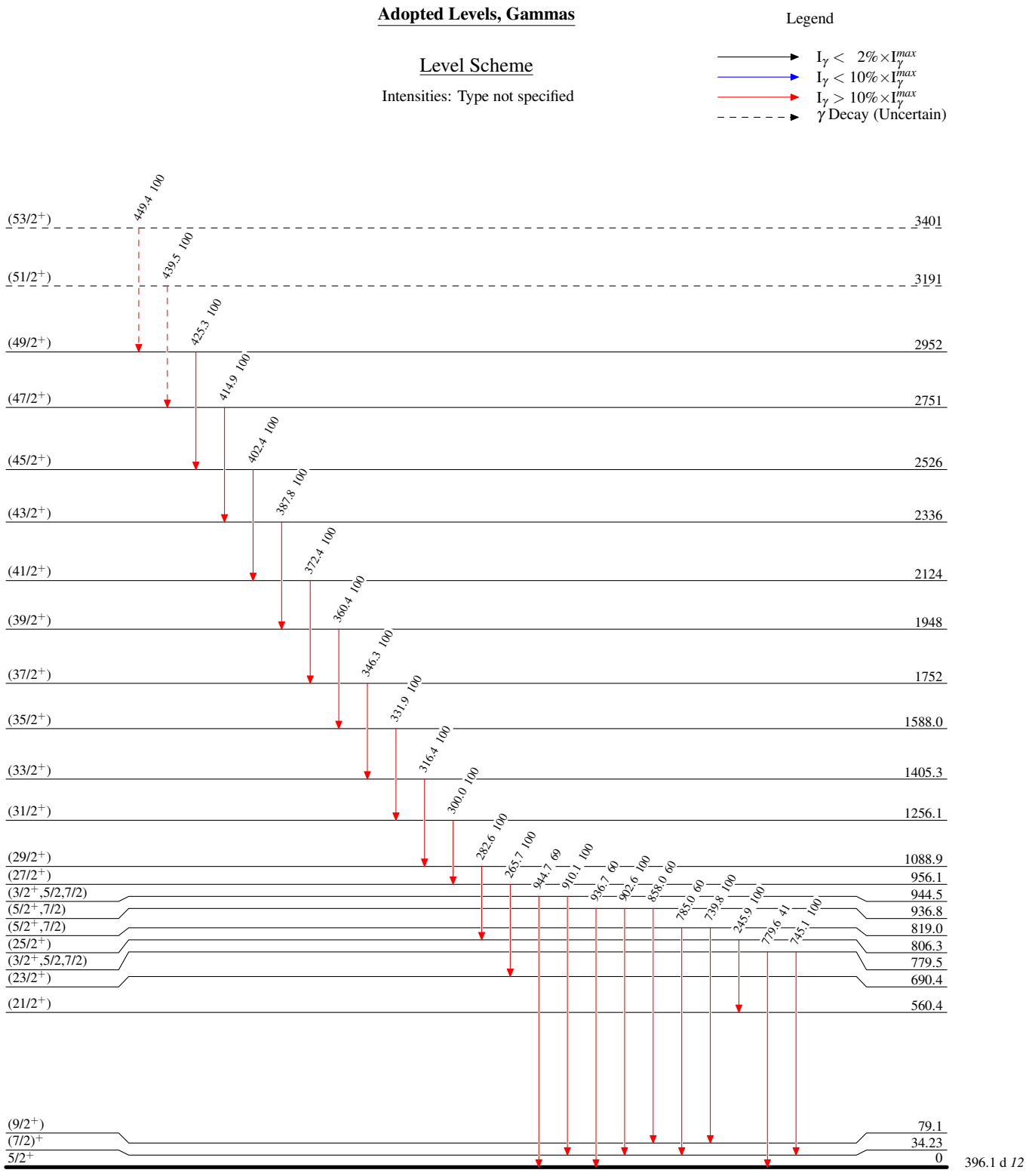
E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π
2526	$(45/2^+)$	402.4 *10*	100	2124	$(41/2^+)$
2751	$(47/2^+)$	414.9 *10*	100	2336	$(43/2^+)$
2952	$(49/2^+)$	425.3 *10*	100	2526	$(45/2^+)$
3191?	$(51/2^+)$	439.5[#] *10*	100	2751	$(47/2^+)$
3401?	$(53/2^+)$	449.4[#] *10*	100	2952	$(49/2^+)$

[†] Additional information 1.
[‡] From ^{235}Pu ε decay or ^{237}Np(^{116}Sn,^{118}Snγ).
[#] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

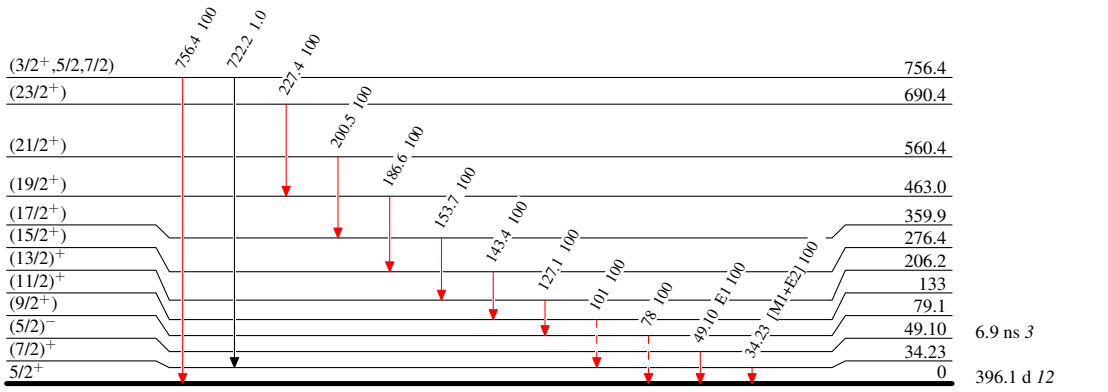


$^{235}_{93}Np_{142}$

Adopted Levels, Gammas

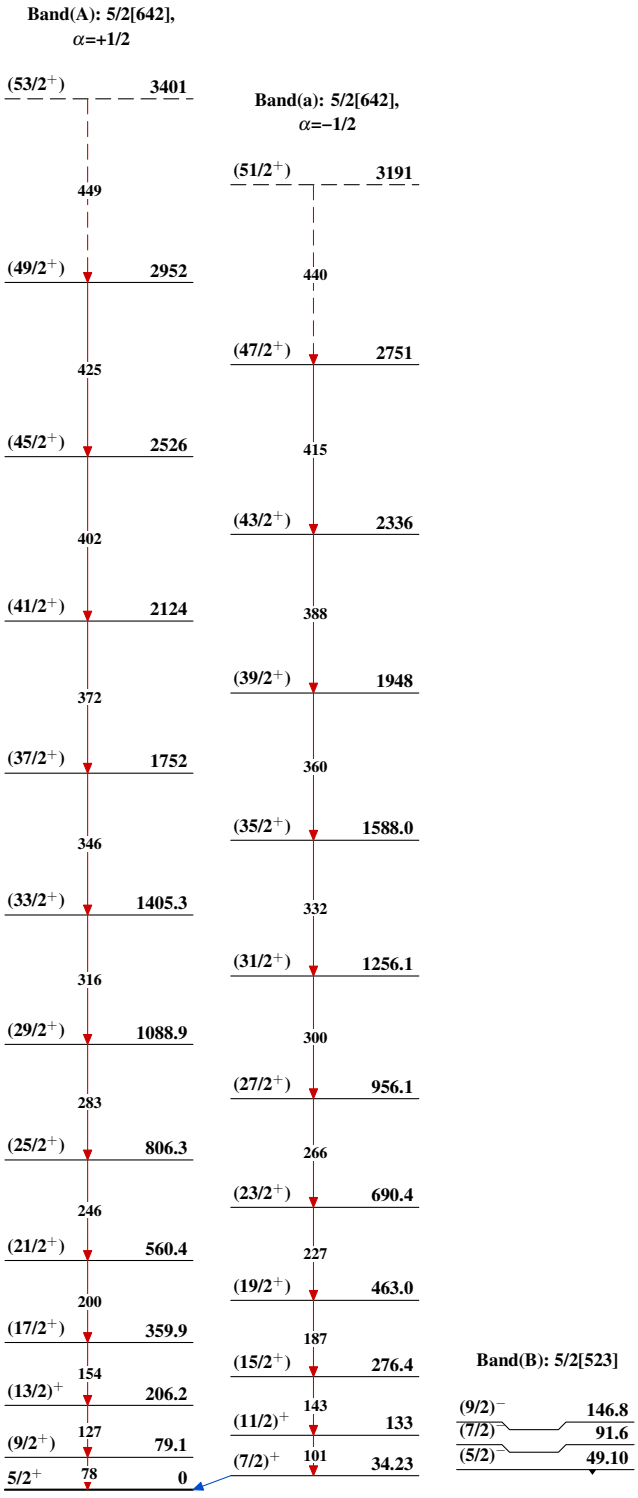
Level Scheme (continued)

Intensities: Type not specified



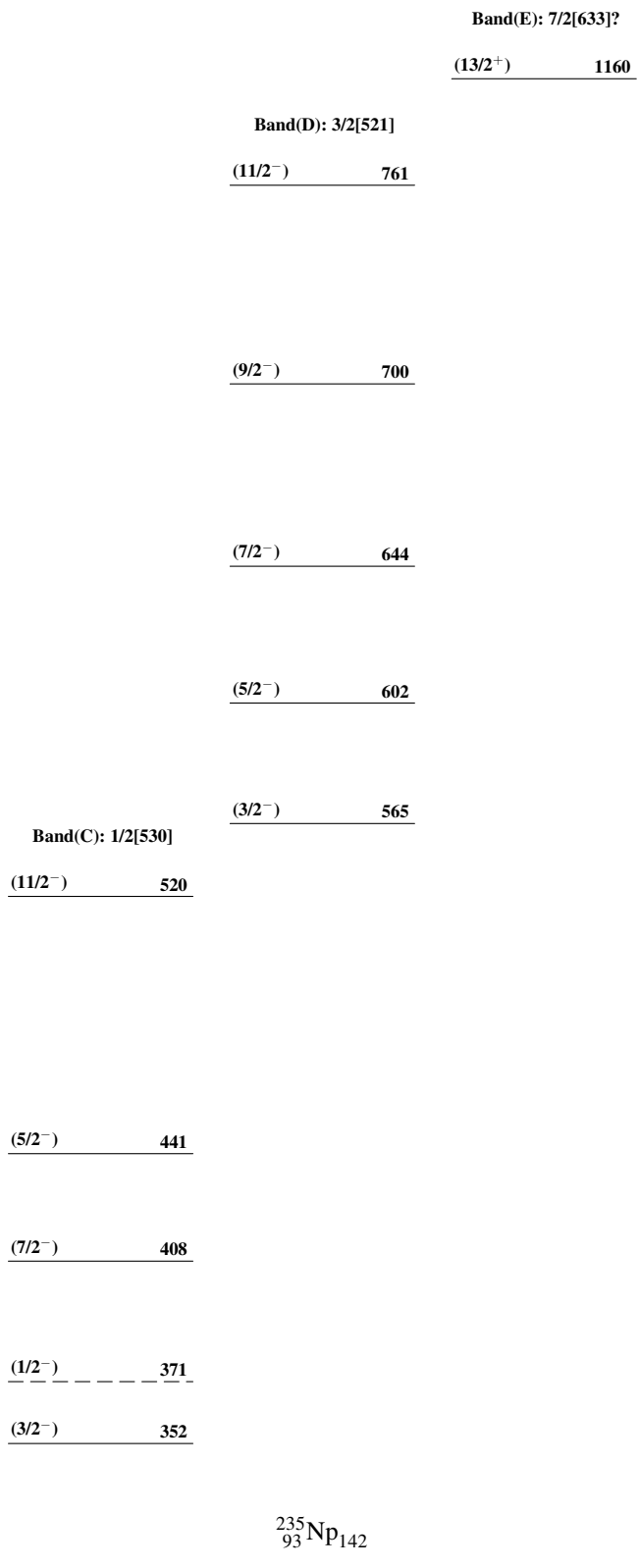
$^{235}_{93}Np_{142}$

Adopted Levels, Gammas



$^{235}_{93}Np_{142}$

Adopted Levels, Gammas (continued)



$^{235}_{93}Np_{142}$