Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Kumar	NDS 147, 382 (2018)	1-Dec-2017

Q(β^-)=736 *6*; S(n)=5933 *6*; S(p)=4677 *5*; Q(α)=7201.4 *12* 2017Wa10
S(2n)=10492 *8*; S(2p)=11813 *7* (2017Wa10).

^{217}At evaluated by F.G. Kondev and S. Kumar.

^{217}At Levels

Cross Reference (XREF) Flags

A ^{221}Fr α decay

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0.0#	9/2$^-$	32.6 ms *3*	A	%α=99.993 *3*; %β^-=0.007 *3* %β^-: Rounded off from %β^-=0.0067% *24* in 1997Ch53. In their earlier work, 1995Ch74 reported %$\beta^-\approx$0.005%. Other: 0.012% *6* (1969LeZW). J$^\pi$: Favored α decay to ^{213}Bi ground state (J$^\pi$=9/2$^-$). $T_{1/2}$: Weighted average of 32.8 ms *3* (2013Su13) and 32.3 ms *4* (1963Di05). Others: 21 ms (1947En03) and 18 ms *2* (1950Ha52).
100.13@ *8*	7/2$^-$	<0.5 ns	A	J$^\pi$: 100.2γ M1 to 9/2$^-$ and 117.8γ M1(+E2) from 5/2$^-$. $T_{1/2}$: From (α)(100.2γ)(t) in ^{221}Fr α decay (1970Al17).
217.97# *9*	5/2$^-$	0.27 ns *2*	A	J$^\pi$: Favored α decay from ^{221}Fr (J$^\pi$=5/2$^-$). $T_{1/2}$: From (α)(218γ)(t) in ^{221}Fr α decay (1970Al17).
271.75@ *10*	3/2$^-$		A	J$^\pi$: 53.8γ M1 to 5/2$^-$, 171.6γ E2 to 7/2$^-$.
310.10& *20*	(13/2$^+$)		A	J$^\pi$: Proposed in 1995Sh01, based on systematics arguments and shell-model predictions. The assignment is tentative.
367.99# *13*	3/2$^-$		A	J$^\pi$: 96.3γ (E2+M1) to 3/2$^-$, 150.0γ M1+E2 to 5/2$^-$.
381.42@ *17*	(7/2)$^-$		A	J$^\pi$: 281.9γ to 7/2$^-$, 381.1γ M1(+E2) to 9/2$^-$.
410.40# *20*	13/2$^-$		A	J$^\pi$: 410.4γ E2 to 9/2$^-$; no γ-ray transitions to lower-spin levels.
424.13@ *22*	(5/2,7/2,9/2)$^-$		A	J$^\pi$: 324.0γ M1(+E2) to 7/2$^-$.
537.8 *5*	(7/2,9/2)		A	J$^\pi$: 437.8γ to 7/2$^-$, 537.5 to 9/2$^-$.
568.7@ *3*	(7/2,9/2)		A	J$^\pi$: 469.0γ to 7/2$^-$, 568.5γ to 9/2$^-$.
576.90# *19*	7/2$^-$		A	J$^\pi$: 208.3γ to 3/2$^-$, 359.0γ M1(+E2) to 5/2$^-$, 576.9γ to 9/2$^-$.
652.0 *20*			A	
663.3@ *3*	(5/2$^-$,7/2,9/2$^-$)		A	J$^\pi$: 446.3γ to 5/2$^-$, 665γ to 9/2$^-$.
809.30 *20*			A	
891.9 *3*			A	

† From a least-squares fit to Eγ.
‡ From the proposed decay scheme in 1995Sh01 and the measured γ-ray transition multipolarities, unless otherwise stated.
# Seq.(A): Dominant $\pi(h_{9/2})^3\nu(g_{9/2})^6$.
@ Seq.(B): Dominant $\pi(f^1_{7/2},h^2_{9/2})\nu(g_{9/2})^6$.
& Probable $\pi(i^1_{13/2},h^2_{9/2})\nu(g_{9/2})^6$.

Adopted Levels, Gammas (continued)

γ(^{217}At)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	δ[‡]	α[#]	Comments
100.13	7/2⁻	100.2 *1*	100	0.0	9/2⁻	M1		11.98	α(K)=9.67 *14*; α(L)=1.76 *3*; α(M)=0.417 *6* α(N)=0.1081 *16*; α(O)=0.0231 *4*; α(P)=0.00320 *5* B(M1)(W.u.)>0.0033 E_γ: From 1995Sh01. Others: 100.63 *2* (1994Ar23), 99.52 *6* (1995Bu17) and 100.25 *2* (1999Gr33). Mult.: α(L)exp=1.2 *6* (1995Sh01).
217.97	5/2⁻	117.8 *2*	0.20 *12*	100.13	7/2⁻	M1(+E2)	<2.1	6.1 *16*	α(K)=3.8 *24*; α(L)=1.70 *60*; α(M)=0.44 *18* α(N)=0.113 *45*; α(O)=0.0228 *84*; α(P)=0.0026 *7* B(M1)(W.u.)>1.3×10^{-5}; B(E2)(W.u.)<1.4 E_γ: From 1995Sh01. Others: 118.0 *2* (1968Le07,1969LeZW), 117.67 *5* (1994Ar23), 118.18 *9* (1995Bu17) and 117.82 *3* (1999Gr33). Mult.,δ: From α(L)exp=1.5 *8* (1969Dz06). Note that α(exp)=13.5 *86* (1999Gr33) is not consistent with either M1 or E2 (α(M1)=7.6, α(E2)=3.9).
		218.0 *1*	100	0.0	9/2⁻	E2		0.368	α(K)=0.1377 *20*; α(L)=0.1705 *24*; α(M)=0.0452 *7* α(N)=0.01168 *17*; α(O)=0.00232 *4*; α(P)=0.000246 *4* B(E2)(W.u.)=40 *3* E_γ: From 1995Sh01. Others: 218.0 *4* (1968Le07,1969LeZW), 218.30 *2* (1994Ar23), 218.14 *3* (1995Bu17) and 218.12 *2* (1999Gr33). Mult.: From K:(L1+L2):L3=1.50 *7*:1.40 *15*:0.53 *5* in 1969Dz06. α(exp)=0.14 used as a normalization in 1995Sh01. γ anisotropy in 1992Li26 is also consistent with Mult=E2.
271.75	3/2⁻	53.8 *1*	19 *3*	217.97	5/2⁻	M1		14.17	α(L)=10.79 *17*; α(M)=2.56 *4* α(N)=0.663 *10*; α(O)=0.1419 *22*; α(P)=0.0196 *3* E_γ: From 1995Sh01. Others: 53.54 *18* (1995Bu17) and 53.81 *3* (1999Gr33). Mult.: α(L)exp=8 *4* (1995Sh01).
		171.6 *1*	100 *3*	100.13	7/2⁻	E2		0.867	α(K)=0.227 *4*; α(L)=0.474 *7*; α(M)=0.1264 *18* α(N)=0.0327 *5*; α(O)=0.00645 *10*; α(P)=0.000670 *10* E_γ: From 1995Sh01. Others: 171.83 *3* (1999Gr33), 171.68 *4* (1995Bu17), 172.05 *5* (1994Ar23). Mult.: α(K)exp=0.3 *1* (1995Sh01); α(exp)=0.84 *2* (1999Gr33).
310.10	(13/2⁺)	310.1 *2*	100	0.0	9/2⁻	[M2]		1.79	α(K)=1.331 *19*; α(L)=0.343 *5*; α(M)=0.0856 *13* α(N)=0.0224 *4*; α(O)=0.00476 *7*; α(P)=0.000641 *9* E_γ: Rounded off from 1995Bu17. Other: 314.20 *5* (1994Ar23).
367.99	3/2⁻	96.3 *3*	16 *7*	271.75	3/2⁻	(E2+M1)		5.8 *32*	E_γ: From 1995Sh01 and 1999Gr33. Other: 96.12 *18* (1995Bu17). Mult.: α(L)exp>2.5 (1995Sh01) would imply a sizable E2 component (α(L,M1)=1.98, α(L,E2)=6.6). Note, that α(exp)=25 *15* (1999Gr33) is not consistent with either M1 or E2 (α(M1)=2.6, α(E2)=8.9).
		150.0 *1*	100 *4*	217.97	5/2⁻	M1+E2	0.54 *24*	3.3 *4*	α(K)=2.5 *5*; α(L)=0.62 *5*; α(M)=0.153 *16* α(N)=0.040 *4*; α(O)=0.0083 *7*; α(P)=0.00105 *4* E_γ: From 1995Sh01. Others: 150.21 *3* (1999Gr33), 150.04 *4* (1995Bu17), 150.43 *5* (1994Ar23).

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Adopted Levels, Gammas (continued)

γ(^{217}At) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	δ[‡]	α[#]	Comments
									Mult.,δ: From α(K)exp=2.6 *5* (1995Sh01) and 2.2 *7* (1969Dz06). Other: α(exp)=3.5 *9* (1999Gr33).
381.42	(7/2)$^-$	281.9 *3*	2.0 *2*	100.13	7/2$^-$	[M1]		0.653	α(K)=0.530 *8*; α(L)=0.0938 *14*; α(M)=0.0222 *4* α(N)=0.00575 *9*; α(O)=0.001231 *18*; α(P)=0.0001700 *25* E_γ: From 1995Sh01. Others: 282.12 *9* (1999Gr33), 282.36 *15* (1995Bu17), 282.25 *5* (1994Ar23).
		381.1 *2*	100 *4*	0.0	9/2$^-$	M1(+E2)	<0.9	0.24 *5*	α(K)=0.19 *5*; α(L)=0.036 *5*; α(M)=0.0087 *11* α(N)=0.0022 *3*; α(O)=0.00048 *6*; α(P)=6.4×10^{-5} *10* E_γ: From 1995Sh01. Others: 382.34 *4* (1999Gr33), 381.81 *4* (1995Bu17), 382.36 *2* (1994Ar23).
									Mult.,δ: From α(K)exp=0.25 *10* (1995Sh01).
410.40	13/2$^-$	410.4 *2*	100	0.0	9/2$^-$	E2		0.0549	α(K)=0.0344 *5*; α(L)=0.01531 *22*; α(M)=0.00392 *6* α(N)=0.001015 *15*; α(O)=0.000206 *3*; α(P)=2.39×10^{-5} *4* E_γ: From 1995Sh01. Others: 410.64 *5* (1999Gr33), 409.93 *7* (1995Bu17), 410.73 *2* (1994Ar23).
									Mult.: α(K)exp=0.03 *1* (1995Sh01).
424.13	(5/2,7/2,9/2)$^-$	324.0 *2*	100	100.13	7/2$^-$	M1(+E2)	<1.1	0.353 *94*	α(K)=0.279 *84*; α(L)=0.056 *8*; α(M)=0.0135 *17* α(N)=0.0035 *5*; α(O)=0.00074 *10*; α(P)=9.9×10^{-5} *17* E_γ: From 1995Sh01. Others: 324.10 *6* (1999Gr33), 323.99 *6* (1995Bu17), 323.99 *3* (1994Ar23).
									Mult.,δ: From α(K)exp=0.4 *2* (1995Sh01).
537.8	(7/2,9/2)	437.8 *5*	23 *3*	100.13	7/2$^-$				E_γ: From 1995Sh01. Others: 437.00 *5* (1999Gr33) and 435.68 *10* (1994Ar23).
		537.5 *8*	100 *8*	0.0	9/2$^-$				E_γ: From 1995Sh01. Others: 537.8 *8* (1999Gr33), 537.0 *2* (1995Bu17) and 538.02 *10* (1994Ar23).
568.7	(7/2,9/2)	469.0 *5*	100 *21*	100.13	7/2$^-$				E_γ: From 1995Sh01. Others: 468.3 *7* (1999Gr33) and 469.6 *2* (1995Bu17).
		568.5 *3*	79 *29*	0.0	9/2$^-$				E_γ: From 1999Gr33 (same in 1995Bu17). Other: 568.4 *10* (1995Sh01).
576.90	7/2$^-$	208.3 *6*	13 *3*	367.99	3/2$^-$	[E2]		0.430 *8*	α(K)=0.1519 *24*; α(L)=0.206 *4*; α(M)=0.0547 *11* α(N)=0.0141 *3*; α(O)=0.00281 *6*; α(P)=0.000296 *6* E_γ: From 1999Gr33. Other: 208.3 *5* (1995Bu17).
		359.0 *2*	100 *4*	217.97	5/2$^-$	M1(+E2)	<0.5	0.31 *3*	α(K)=0.251 *23*; α(L)=0.0459 *25*; α(M)=0.0109 *6* α(N)=0.00282 *14*; α(O)=0.00060 *4*; α(P)=8.2×10^{-5} *6* E_γ: From 1995Sh01. Others: 359.86 *4* (1999Gr33) and 359.92 *6* (1995Bu17).
									Mult.,δ: From α(K)exp=0.4 *1* (1995Sh01).
		576.9 *4*	9.2 *9*	0.0	9/2$^-$	[M1]		0.0948	α(K)=0.0772 *11*; α(L)=0.01342 *19*; α(M)=0.00317 *5* α(N)=0.000820 *12*; α(O)=0.0001756 *25*; α(P)=2.43×10^{-5} *4* E_γ: From 1999Gr33 (same in 1995Bu17). Other: 577.0 *8* (1995Sh01) and 577.76 *6* (1994Ar23).
652.0		652 *2*	100	0.0	9/2$^-$				E_γ: From 1999Gr33.
663.3	(5/2$^-$,7/2,9/2$^-$)	281.8 *3*		381.42	(7/2)$^-$				E_γ: Doublet from 1995Sh01.

Adopted Levels, Gammas (continued)

$\gamma(^{217}At)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ	E_f	J_f^π	Comments
663.3	(5/2$^-$,7/2,9/2$^-$)	446.3 *8*	100 *27*	217.97	5/2$^-$	E_γ: From 1995Sh01. Others: 446.30 *8* (1999Gr33) and 445.07 *20* (1995Bu17).
		562.3 *12*	≈33	100.13	7/2$^-$	E_γ: From 1995Sh01.
		665 *2*	≈53	0.0	9/2$^-$	E_γ: From 1999Gr33.
809.30		809.3 *2*	100	0.0	9/2$^-$	E_γ: From 2002Gr36.
891.9		891.9 *3*	100	0.0	9/2$^-$	E_γ: From 2002Gr36.

[†] From 1995Sh01, unless otherwise stated. Uncertainties quoted for many Eγ in 1999Gr33, 1995Bu17 and 1994Ar23 are unrealistically small, given the large-size Ge detectors used in these measurements and the absence of information regarding the calibration procedure.

[‡] From ce measurements of 1969Dz06 and 1995Sh01 and α(T) in 1999Gr33. Mixing ratios, δ, were determined using the BrIccmixing program.

[#] Additional information 1.

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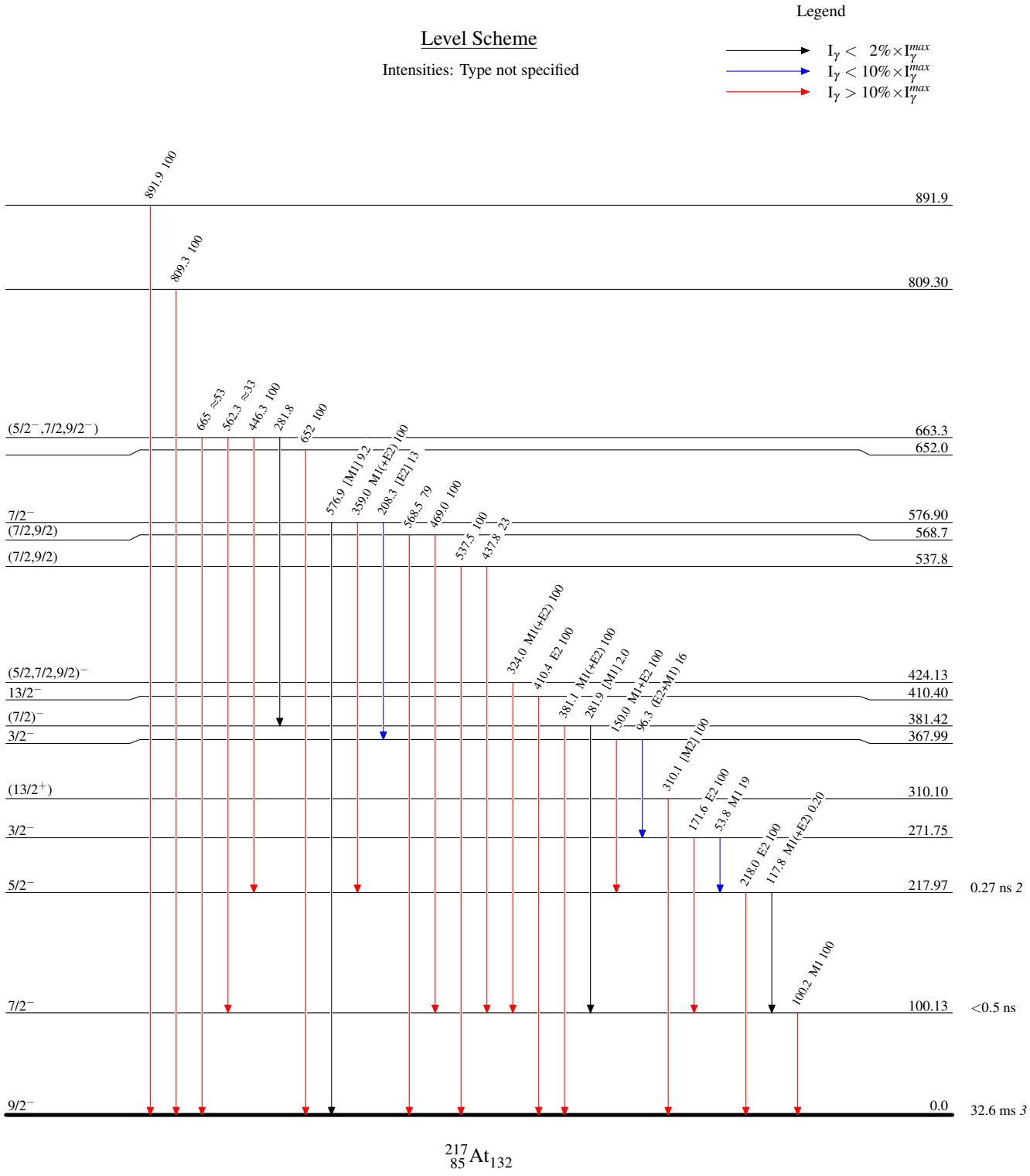
Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified



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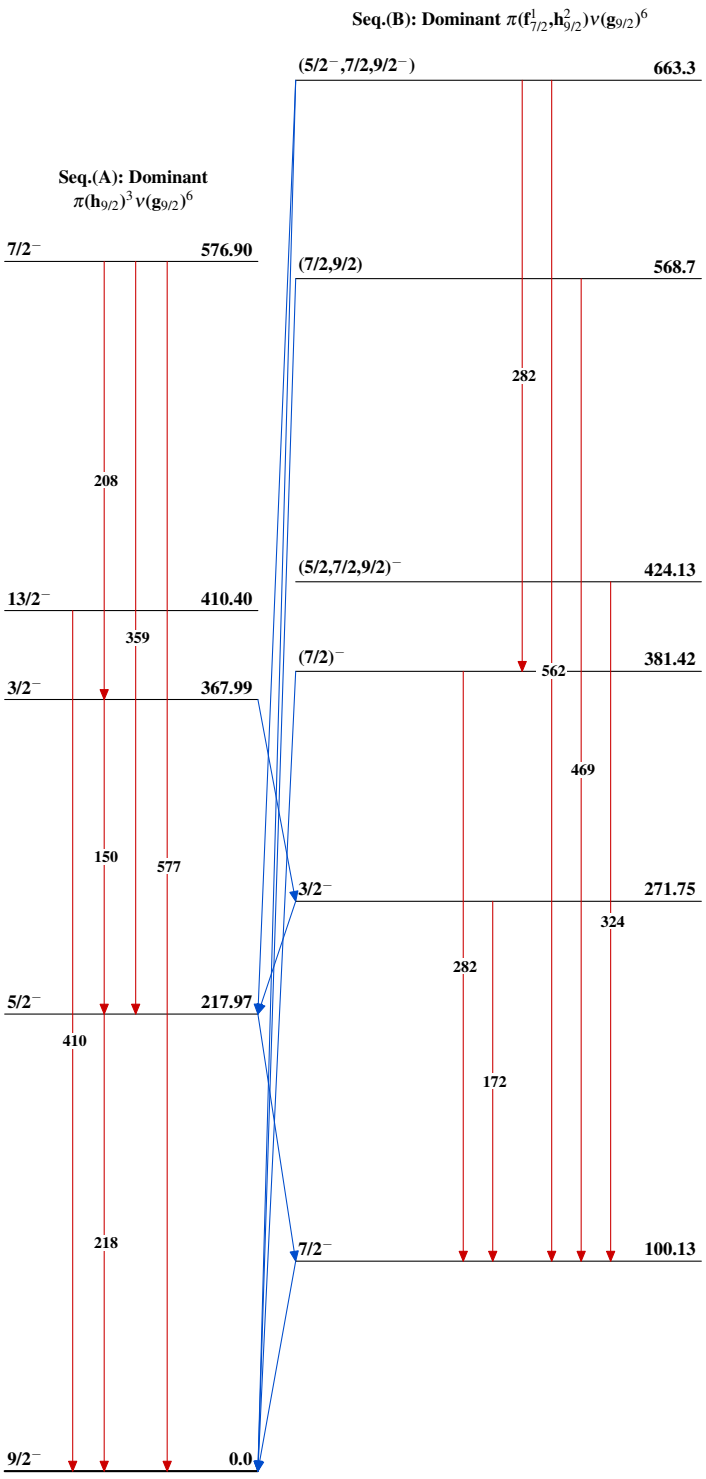
Adopted Levels, Gammas



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