Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 192,1 (2023)	1-Aug-2023

Q(β^-)=−4987 *25*; S(n)=8236 *25*; S(p)=1.038 *25*; Q(α)=6596.2 *13* 2021Wa16

^{200}At Levels

Cross Reference (XREF) Flags

A ^{204}Fr α decay (2.05 s)
B ^{204}Fr α decay (2.31 s)
C ^{204}Fr α decay (1.65 s)

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0	(3$^+$)	43.1 s *8*	ABC	%α=52 *4*; %ε+%β^+=48 *4* μ=4.28 *15* Q=−0.50 *5* %α: Weighted average of 57% *6* (1992Hu04) and 49% *4* in 1998Bo14. Other: %α=32 *6* in 1974Ho27. %ε+%β^+ was not directly measured. μ,Q: from measured hyperfine-structure constants and isotope shifts using the in-source resonance-ionization spectroscopy method. Magnetic moment is deduced using a reference value of μ=4.139 *37* for ^{211}At (2018Cu02). μ: from 4.279 *96*(stat)*110*(syst) in 2018Cu02 with statistical and systematic uncertainties added in quadrature. Same value given in 2019StZV. Q: from −0.50 *8*(stat)*50*(syst) in 2018Cu02 with statistical and systematic uncertainties added in quadrature. Same value given in 2021StZZ. δ<r^2>(^{200}At,^{205}At)=−0.293 fm^2 *7*(stat)*15*(syst) in 2018Cu02. J$^\pi$: Favored α decay to ^{196}Bi g.s. (J^π=(3$^+$)). T$_{1/2}$: Weighted average of 44 s *2* (1996Ta18), 43 s *1* (1992Hu04), 42 s *2* (1967Tr06) and 44 s *3* (1975BaYJ). Other: 54 s *12* (1963Ho18). Eα=6467 keV *6* (2005Uu02), 6464 keV *2* (1992Hu04), 6461 keV *5* (1996Ta18), 6461 keV (1987Va09), 6465 keV *2* (1975BaYJ) and 6463 keV *5* (1967Tr06). configuration: Probable $\pi(h^{+1}_{9/2})\otimes\nu(f^{-1}_{5/2})$.
112.9 *29*	(7$^+$)	47 s *1*	BC	%α=43 *7*; %ε+%β^+=57 *7* μ=4.74 *18* Q=−1.0 *5* %α: From 1992Hu04. Other: %α=21 *4* in 1974Ho27. %ε+%β^+ was not directly measured. μ,Q: From measured hyperfine-structure constants and isotope shifts using the in-source resonance-ionization spectroscopy method. Magnetic moment is deduced using a reference value of μ=4.139 *37* for ^{211}At (2018Cu02). μ: From 4.74 *13*(stat)*12*(syst) in 2018Cu02 with statistical and systematic uncertainties added in quadrature. μ=4.72 *18* in 2019StZZ. Q: From −0.96 *12*(stat)*50*(syst) in 2018Cu02 with statistical and systematic uncertainties added in quadrature. Same value given in 2021StZZ. δ<r^2>(^{200}At,^{205}At)=−0.277 fm^2 *7*(stat)*14*(syst) (2018Cu02). E(level): From 2021Ko07, based on recommended Q(α) in the α-decay of the J^π=(7$^+$) (6709.1 keV *26*) and (3$^+$) (6596.2 keV *13*) states in ^{200}At to the ^{196}Bi ground state (2021Hu06). J$^\pi$: Favored α decay to ^{196}Bi isomeric state (J^π=(7$^+$)). T$_{1/2}$: From 1992Hu04. Others: 47 s *3* (1996Ta18), 42 s *2* in 1967Tr06. Eα=6413 keV *6* (2005Uu02), 6414 keV *1* (1996Ta18), 6411 keV *2* (1992Hu04), 6409 keV (1987Va09), 6412 keV *2* (1975BaYJ) and 6412 keV *5* (1967Tr06). configuration: Probable $\pi(h^{+1}_{9/2})\otimes\nu(f^{-1}_{5/2})$.
113 *1*	(2,4)$^+$		A	E(level): From Eγ=113 keV *1* to g.s. (1992Hu04).

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Adopted Levels, Gammas (continued)

^{200}At Levels (continued)

E(level)	J^π	$T_{1/2}$	XREF	Comments
				J^π: 113γ (M1) to (3^+). The HF in ^{204}Fr α-decay (2.05 s, J^π=(3^+)) would exclude J^π=3^+.
343.8 *29*	(10^-)	6.3 s *5*	C	%α≈10.5 *3*; %IT≈89.5 *3* μ=2.69 *11* Q=+0.5 *4* %α: From 1992Hu04. %IT was not directly measured. %ε + %β^+ branch is also possible. μ,Q: from measured hyperfine-structure constants and isotope shifts using the in-source resonance-ionization spectroscopy method. Magnetic moment is deduced using a reference value of μ=4.139 *37* for ^{211}At (2018Cu02). μ: from 2.694 *82*(stat)*65*(syst) in 2018Cu02 with statistical and systematic uncertainties added in quadrature. μ=2.68 *11* in 2021StZZ. Q: from +0.54 *25*(stat)*30*(syst) in 2018Cu02 with statistical and systematic uncertainties added in quadrature. Same value given in 2021StZZ. δ<r^2>(^{200}At,^{205}At)=−0.258 fm^2 *9*(stat)*13*(syst) (2018Cu02). E(level): From E(J^π=(7^+))=112.9 keV *29* and Eγ=230.9 keV *2* (1992Hu04). $T_{1/2}$: From 1996Ta18. Others: 7.3 s *+26−15* (2005Uu02), 3.5 s *2* (1992Hu04), 5 s *2* (1975BaYJ) and 4.3 s *3* (1967Tr06). J^π: Favored α decay to ^{196}Bi isomeric state (J^π=(10^-)); 230.9γ E3 to (7^+). Eα=6543 keV *6* (2005Uu02), 6528 keV *1* (1996Ta18), 6538 keV *3* (1992Hu04) and 6536 keV *5* (1967Tr06). configuration: Probable $\pi(h^{+1}_{9/2})\otimes\nu(i^{-1}_{13/2})$.

γ(^{200}At)

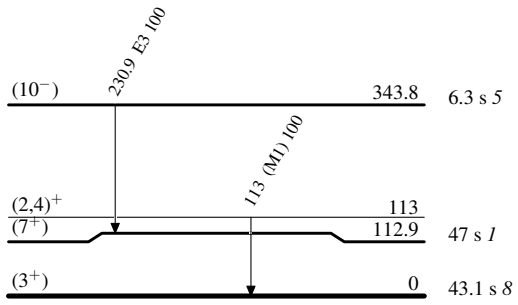
E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.	α[†]	Comments
113	$(2,4)^+$	113 *1*	100	0	(3^+)	(M1)	8.54 *25*	α(K)=6.90 *20*; α(L)=1.24 *4*; α(M)=0.295 *9* α(N)=0.0764 *23*; α(O)=0.0164 *5*; α(P)=0.00226 *7* Mult.: Reported in 1992Hu04, but no spectroscopic information is presented by the authors.
343.8	(10^-)	230.9 *2*	100	112.9	(7^+)	E3	2.49 *4*	α(K)=0.312 *4*; α(L)=1.592 *23*; α(M)=0.442 *6* α(N)=0.1152 *17*; α(O)=0.02282 *34*; α(P)=0.002393 *35* B(E3)(W.u.)≈0.00059 *5* Mult.: From α(K)exp=0.29 *8*, α(L)exp=1.1 *2* and α(M)exp=0.27 *6* in 1992Hu04.

[†] Additional information 1.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{200}_{85}At_{115}$