^{187}Ta β^- decay (283 s) 2022Mu10

Type	Author	History Citation	Literature Cutoff Date
Update	Balraj Singh	ENSDF	31-Mar-2022

Parent: ^{187}Ta: E=0.0; $J^\pi=(7/2^+)$; $T_{1/2}$=283 s *10*; Q(β^-)=3010 *60*; %β^- decay=100.0

^{187}Ta-J^π,$T_{1/2}$: From 2022Mu10, measured by growth and decay time spectrum of γ rays in coincidence with β^-. Same value is given in ^{187}Ta Adopted Levels.

^{187}Ta-Q(β^-): From 2021Wa16.

2022Mu10: ^{187}Ta was produced at the KEK Isotope Separation System (KISS) of RIBF-RIKEN facility in multinucleon transfer (MNT) reaction W(^{136}Xe,X),E=7.2 MeV/nucleon at the RIKEN Ring Cyclotron. Target-like fragments were thermalized, with element-selectively reionized by using a laser resonance ionization method, followed by A/Q selection using a dipole magnet with a high mass resolving power. Measured Eγ, Iγ, β^-, $\beta^-\gamma$-coin, half-life of ^{187}Ta decay.

^{187}W Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	$3/2^-$	23.80 h *3*	
77.2 *1*	$5/2^-$		
201.34 *8*	$7/2^-$		
350.22 *9*	$7/2^-$	5 ns *1*	$T_{1/2}$: from ^{187}W Adopted Levels.

† Deduced by evaluator from least-squares fot to Eγ values.
‡ From the Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(2.66×10^3 *6*)	350.22	95 *7*	6.01 *6*	av Eβ=1035 *27* Iβ^-: deduced by evaluator from I(γ+ce) for 148.8, 273.0 and 350.5 transitions. 2022Mu10 give 87 *16*.
(2.81×10^3 *6*)	201.34	6 *4*	7.3 *3*	av Eβ=1101 *27* Iβ^-: deduced by evaluator from I(γ+ce) balance. 2022Mu10 give 9 *3*.
(2.93×10^3‡ *6*)	77.2	<4	>7.6	av Eβ=1156 *27* Iβ^-: −7 *11* deduced by evaluator from I(γ+ce) balance. 2022Mu10 give 0 *8*.
(3.01×10^3‡ *6*)	0.0	<14	>8.4[1u]	av Eβ=1190 *27* Iβ^-: 5 *9* deduced by evaluator from I(γ+ce) balance. 2022Mu10 give 3 *13*.

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{187}W)

Iγ normalization: Absolute γ-ray intensities (per 100 decays) are given in 2022Mu10.

E$_\gamma$†	I$_\gamma$†#	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	δ	α@	Comments
77.24 *8*	6.8 *8*	77.2	$5/2^-$	0.0	$3/2^-$	M1+E2‡	0.45‡ *2*	10.17	α(K)=7.03 *14*; α(L)=2.40 *9*; α(M)=0.580 *23* α(N)=0.138 *6*; α(O)=0.0204 *7*; α(P)=0.000722 *14* E$_\gamma$: 77.3 in Fig. 3 of 2022Mu10; 77.28 *4* in

Continued on next page (footnotes at end of table)

^{187}Ta β^- decay (283 s) 2022Mu10 (continued)

$\gamma(^{187}W)$ (continued)

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[@]	Comments
									Adopted Gammas. Conversion coefficients for Eγ=77.28 *4* in ^{187}W Adopted Gammas.
123.9 *2*	3.1 *5*	201.34	7/2$^-$	77.2	5/2$^-$	M1+E2[‡]	1.3[‡] *+6−3*	2.01 *13*	α(K)=1.14 *22*; α(L)=0.66 *7*; α(M)=0.162 *19* α(N)=0.038 *5*; α(O)=0.0055 *6*; α(P)=0.000106 *24* E_γ: 124.2 in Fig. 3 of 2022Mu10; 124.23 *3* in the Adopted Gammas. Conversion coefficients for Eγ=124.23 *3* in the Adopted Gammas. Iγ(123.9)/Iγ(201.3)=0.246 *41* as compared to 0.126 *2* in ^{187}W Adopted Gammas, and 0.186 *10* in (n,γ) (2014Hu02).
148.8 *1*	8.8 *4*	350.22	7/2$^-$	201.34	7/2$^-$	(M1,E2)		1.2 *4*	α(K)=0.8 *5*; α(L)=0.29 *9*; α(M)=0.070 *25* α(N)=0.017 *6*; α(O)=0.0025 *7*; α(P)=8×10^{-5} *5* E_γ: 149.0 in Fig. 3 of 2022Mu10; 148.96 *4* in the Adopted Gammas. Iγ(148.8)/Iγ(273.0)=0.144 *8* as compared to 0.114 *3* in the Adopted Gammas, and 0.153 *9* in (n,γ) (2014Hu02).
201.3 *1*	12.6 *6*	201.34	7/2$^-$	0.0	3/2$^-$	[E2]		0.302 *5*	α(K)=0.1658 *24*; α(L)=0.1032 *15*; α(M)=0.0257 *4* α(N)=0.00607 *9*; α(O)=0.000856 *13*; α(P)=1.314×10^{-5} *19* E_γ: 201.4 in Fig. 3 of 2022Mu10; 201.42 *1* in the Adopted Gammas.
273.0 *1*	61 *2*	350.22	7/2$^-$	77.2	5/2$^-$	(M1,E2)		0.20 *9*	α(K)=0.15 *9*; α(L)=0.034 *4*; α(M)=0.0079 *5* α(N)=0.00190 *13*; α(O)=0.00029 *4*; α(P)=1.5×10^{-5} *9* E_γ: 273.1 in Fig. 3 of 2022Mu10; 273.14 *1* in the Adopted Gammas.
350.5 *2*	2.1 *5*	350.22	7/2$^-$	0.0	3/2$^-$	[E2]		0.0540 *8*	α(K)=0.0381 *6*; α(L)=0.01217 *18*; α(M)=0.00294 *5* α(N)=0.000700 *10*; α(O)=0.0001032 *15*; α(P)=3.35×10^{-6} *5* E_γ: 350.4 in Fig. 3 of 2022Mu10; 350.40 *11* in the Adopted Gammas. Iγ(350.5)/Iγ(273.0)=0.034 *8* as compared to 0.025 *2* in the Adopted Gammas, and 0.0164 *19* in (n,γ) (2014Hu02).

[†] From Table I in 2022Mu10. Note that Eγ values listed in authors′ level-scheme Fig. 3 seem to be either from level-energy differences, or rounded values from ^{187}W Adopted Gammas, thus, are slightly different from those in authors′ Table I.
[‡] From ^{187}W Adopted Gammas.
[#] Absolute intensity per 100 decays.
[@] 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.

^{187}Ta β^- decay (283 s) 2022Mu10

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays