^{187}Ta IT decay (7.3 s) 2020Wa29

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Mar-2022

Parent: ^{187}Ta: E=1778 *1*; J^π=(25/2$^-$); $T_{1/2}$=7.3 s *9*; %IT decay>60.0

^{187}Ta-%IT decay: From $\%\beta^-$<40, estimated by 2020Wa29 based on γ data from this work and β-decay data from 2010Re07,2012Re19, assuming no other decay branches.

This dataset is adapted from compiled dataset by J. Chen (NSCL, MSU), March 13, 2020 available in the XUNDL database.

2020Wa29: ^{187}Ta isomers produced in multinucleon transfer reaction with a 7.2 MeV/nucleon ^{136}Xe ions from the RIKEN ring cyclotron on a 5−μm-thick natural tungsten target at RIBF-RIKEN facility. Laser-ionized tantalum was mass-separated and transported to a moving-tape collection point surrounded by a low-background 32-element gas proportional with 80% of 4π solid angles for β^- particles and conversion electrons, and four super Clover Ge detectors. Measured Eγ, Iγ, Eβ, Iβ, E(ce), I(ce), $\beta\gamma$-coin, $\beta\gamma$(t). Deduced levels, J, π, isomer $T_{1/2}$, conversion coefficient, γ-ray multipolarity. Comparisons with total Routhian surface (TRS) calculations for the π9/2[514] band.

^{187}Ta Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	(7/2$^+$)		Configuration=π7/2[404].
154.8 *4*	(9/2$^+$)		
245.2[#] *4*	(9/2$^-$)		
403.8[@] *5*	(11/2$^-$)		
595.5[#] *7*	(13/2$^-$)		
802.1[@] *7*	(15/2$^-$)		
1053.8[#] *7*	(17/2$^-$)		
1287.0[@] *8*	(19/2$^-$)		
1586.4[#] *8*	(21/2$^-$)		
1778.1 *10*	(25/2$^-$)	7.3 s *9*	%IT>60; $\%\beta^-$<40 $T_{1/2}$: from sum of $\beta\gamma$(t) of transitions following the IT decay. %IT>60 from $\%\beta^-$<40 estimated by 2020Wa29 based on γ data from this work and β-decay data from 2010Re07,2012Re19, assuming no other decay branches. Configuration=π7/2[404]⊗ν11/2[615]⊗ν7/2[503] or π9/2[514]⊗ν9/2[505]⊗ν7/2[503], K^π=25/2$^-$ (2020Wa29).

[†] From least-squares fit to γ-ray energies.
[‡] As given in 2020Wa29, based on assignment to π9/2[514] configuration.
[#] Band(A): π9/2[514],α=+1/2.
[@] Band(a): π9/2[514],α=−1/2.

γ(^{187}Ta)

E_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
90.4 *5*	245.2	(9/2$^-$)	154.8	(9/2$^+$)		
154.8 *5*	154.8	(9/2$^+$)	0.0	(7/2$^+$)		
158.6 *5*	403.8	(11/2$^-$)	245.2	(9/2$^-$)		
191.7[#‡] *5*	595.5	(13/2$^-$)	403.8	(11/2$^-$)		
191.7[#‡] *5*	1778.1	(25/2$^-$)	1586.4	(21/2$^-$)	(E2)	Mult.: tentative assignment (2020Wa29) based on measured α(exp)=0.57 *24*, consistent with Mult=M1 or E2, and considering that M1 assignment would indicate a competing E2 transition to 1287 level, which is not observed.
206.6 *5*	802.1	(15/2$^-$)	595.5	(13/2$^-$)		

Continued on next page (footnotes at end of table)

^{187}Ta IT decay (7.3 s) 2020Wa29 (continued)

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

E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π
233.2 *5*	1287.0	$(19/2^-)$	1053.8	$(17/2^-)$	350[@]	595.5	$(13/2^-)$	245.2	$(9/2^-)$
245.2 *5*	245.2	$(9/2^-)$	0.0	$(7/2^+)$	398.3 *5*	802.1	$(15/2^-)$	403.8	$(11/2^-)$
249.0 *5*	403.8	$(11/2^-)$	154.8	$(9/2^+)$	458.3 *5*	1053.8	$(17/2^-)$	595.5	$(13/2^-)$
251.7 *5*	1053.8	$(17/2^-)$	802.1	$(15/2^-)$	484.9 *5*	1287.0	$(19/2^-)$	802.1	$(15/2^-)$
299.4 *5*	1586.4	$(21/2^-)$	1287.0	$(19/2^-)$	532.6 *5*	1586.4	$(21/2^-)$	1053.8	$(17/2^-)$

† From 2020Wa29.
‡ Doublet with intensities separately determined (2020Wa29), but intensity values are not given by authors.
# Multiply placed.
@ Placement of transition in the level scheme is uncertain.

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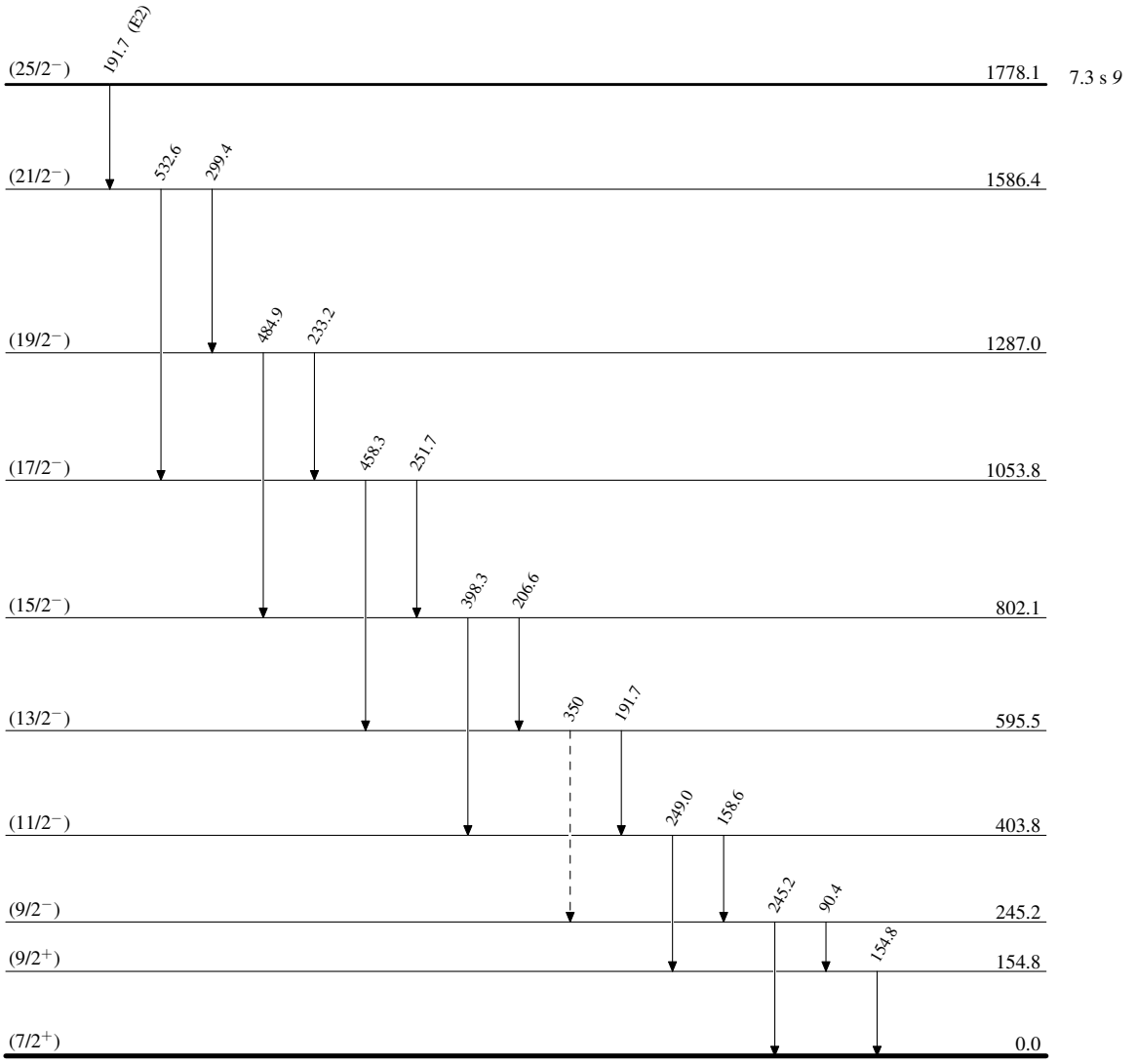
Legend

Decay Scheme

%IT>60.0

γ Decay (Uncertain)



$^{187}_{73}Ta_{114}$

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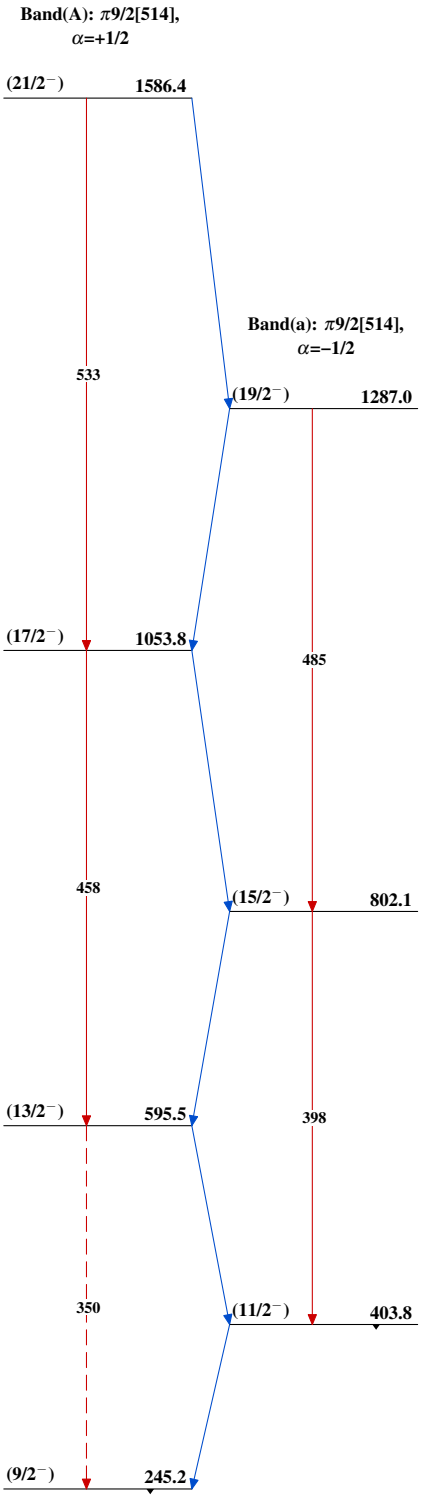

$^{187}_{73}Ta_{114}$