^{186}Ta IT decay 2021Wa39

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. C. Batchelder and A. M. Hurst, M. S. Basunia	NDS 183, 1 (2022)	1-Mar-2022

Parent: ^{186}Ta: E=347.9 *3*; J^π=(7^+); $T_{1/2}$=17 s *2*; %IT decay=100.0

^{186}Ta-J^π: From Adopted Levels. Other: (9^+) in 2021Wa39. See ^{186}Ta g.s. comments in Adopted Levels.

2021Wa39: ^{187}Ta produced via a 7.2 MeV/nucleon ^{136}Xe ion beam incident on a natural W target with an intensity of 50pnA at the RIKEN Nishina Center. Laser ionization followed by mass separation. ^{187}Ta ions implanted onto a moving tape in an array consisting of two concentric layers of 16 proportional gas counter tubes and four Ge clover detectors. Measured Eγ, Iγ, Eβ, Iβ, E(ce), I(ce), $\beta\gamma$-coin, $\beta\gamma$(t).

^{186}Ta Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0	(3^-)	10.39 min *3*	$T_{1/2}$: From Adopted Levels. Other: 10.8 min *5* – from summed-γ(t) using 12 gamma transitions (2021Wa39).
186.8 *1*	(4^-)		
347.9 *3*	(7^+)	17 s *2*	Listed as (9^+) in (2021Wa39) where a (5^-) ground state was assumed. $T_{1/2}$: From (161γ+186.8γ)(t) (2021Wa39).

[†] From Eγ.

[‡] From Adopted Levels. 2021Wa39 assume a (5^-) g.s. and from the feeding of a cascade of the (E3) 161.1γ and (M1+E2) 186.8γ, propose (9^+) for the isomeric state at 347.9. See the J^π comments for g.s. in Adopted Levels. It should be noted that ^{186}Ta is an odd-odd nucleus and could have low-lying states closer to the g.s. that the aforementioned γ's have fed.

$\gamma(^{186}Ta)$

Eγ	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	Comments
161.1 *2*	347.9	(7^+)	186.8	(4^-)	(E3)	Mult.: Based on the ratio of $(1+\alpha_{K(1e)})/(1+\alpha_{tot})$=0.20 (2021Wa39), where $\alpha_{K(1e)}$ and α_{tot} are conversion coefficients for hydrogen like atom and for neutral atoms. Also from comparison of $T_{1/2}$ of neutral atom to that of hydrogen-like atom (2021Wa39).
186.8 *1*	186.8	(4^-)	0	(3^-)	(M1+E2)	Iγ(186.8γ/161.1γ)=12.8 *28* (2021Wa39). Mult.: The γ-ray total intensity balance at this level agrees for a pure M1 or E2 of 186.8γ within two standard deviations. Authors of 2021Wa39 note 186.8γ may be considered as a mixed M1/E2 transition and E3 161.1γ gives α=0.49 *11* for the 186.8γ based on their measured intensity ratio.

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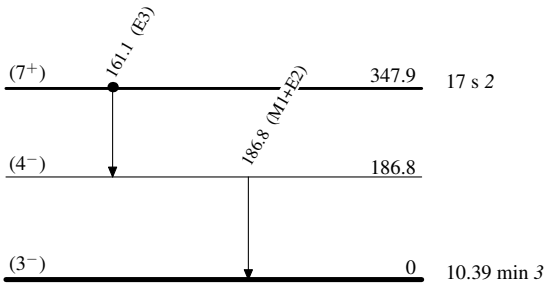
Legend

Decay Scheme

%IT=100.0

● Coincidence



$^{186}_{73}Ta_{113}$