Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Juutinen, D. J. Hartley	NDS 150, 1 (2018)	1-Feb-2018

Q(β^-)=5056 *55*; S(n)=4788 *78*; S(p)=8084 *SY*; Q(α)=375 *SY* 2017Wa10
Δ(S(p))=303, Δ(Q(α))=303 (syst,2017Wa10).

^{188}Ta Levels

Cross Reference (XREF) Flags

A ^{9}Be(^{208}Pb,Xγ)

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0	(1$^-$)	19.6 s *20*	A	%β^-=100 J$^\pi$: Based on the large total intensity for the 142.9γ, depopulating the 2$^+$ state of ^{188}W, which is fed in β-decay of ^{188}Ta and the proposed configuration. The assignment is tentative. The ground state for even-N Ta (Z=73) nuclei are assigned 7/2$^+$, resulting from the π7/2[404] orbital. Considering the observed neutron states in ^{187}W (N=113), a neighbouring nucleus that is expected to have similar deformation as ^{188}Ta, (0.0 keV, 3/2[512]; 145.7 keV, 1/2$^-$[510]; 330 keV, 7/2[503]; 350 keV, 9/2[505] and 410 keV, 11/2[615]), one may expect that the ν7/2[503] orbital is closest to the Fermi surface in ^{188}Ta (N=115), and hence, the π7/2[404]⊗ν7/2[503] configuration. The Gallagher-Moskowski rule favours the K$^\pi$=0$^-$ over 7$^-$ assignment. The J$^\pi$=1$^-$ state within this configuration may be lower than the expected K$^\pi$=0$^-$ bandhead, depending on the size and sign of the Newby shift, which are unknown at present. The π7/2[404]⊗ν9/2[505] configuration should be considered as an alternative, but in such a case the Gallagher-Moskowski rule would favor K$^\pi$=8$^-$ over 1$^-$ assignment. Calculations in 1997Mo25 favour the π7/2[404]⊗ν7/2[503] assignment. T$_{1/2}$: From $\beta\gamma$(t) in ^{188}Ta β- decay, using the 143-, 297- and 434-keV transitions (2009Al30), where the existence of an isomer with a similar lifetime as for the ground state was suggested (2009Al30). The assignment is tentative. Others:>100 s (calculated,1997Mo25).
99 *33*	(7$^-$)	19.6 s *20*	A	%β^-=?; %IT=? E(level): From 2012ReZZ, assumed by the evaluators to be the excitation energy of the (7$^-$) isomer. The assignment is tentative. J$^\pi$: Direct β-decay feeding to the K$^\pi$=8$^-$ isomer in ^{188}W and the proposed π7/2[404]⊗ν7/2[503] configuration. The non observation of 348γ, the (9$^-$) to (8$^-$), K$^\pi$=8$^-$ in band transition in ^{188}W (2009Al30), would argue against J=8 or 9 assignment. Alternatively, if the π7/2[404]⊗ν9/2[505] configuration is considered, then the Gallagher-Moskowski rule would favor K$^\pi$=1$^-$ for the isomer and 8$^-$ for the g.s.. The assignment is tentative. T$_{1/2}$: From $\beta\gamma$(t) in ^{188}Ta β- decay, using 143-, 297- and 434-keV transitions (2009Al30), where the existence of an isomer with a similar lifetime as the ground state was suggested (2009Al30). The assignment is tentative.
391 *33*		3.7 μs *4*	A	E(level): Based on the preferential populaton of high-spin states in fragmentaton reactions, evaluators assume that 292.4γ populates the (7$^-$) isomer. It is reported in 2005Ca02 that a low-energy (<50 keV) γ ray may precede or follow the 292.4 keV transition. The assignment is tentative. T$_{1/2}$: Weighted average of 5 μs 2 (from 292.4γ(t) in 2005Ca02), 4.4 μs 10 (from 292γ(t) in 2009Al30) and 3.5 μs 4 (from 291.9γ(t) in 2011St21). An isomeric ratio (number of ions found in isomeric state to the total number of ions produced for that nuclide) was measured to be 0.5 % *+3−1* in 2005Ca02, but 8 % *2* in 2011St21.

Adopted Levels, Gammas (continued)

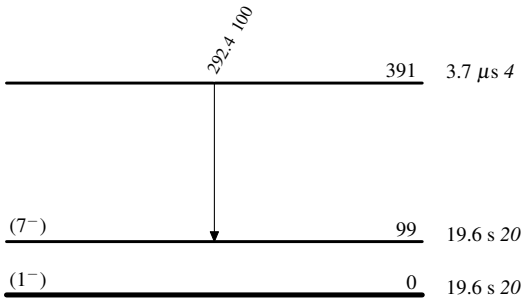
$\gamma(^{188}Ta)$

E_γ	I_γ	E_i(level)	E_f	J^π_f	Comments
292.4 *2*	100	391	99	(7^-)	E_γ: From 2005Ca02. Others: 291.9 keV 5 (2011St21) and 292 keV (2009Al30,2012Al05). Mult.: The authors in 2005Ca02 ruled out a M2 assignment due to the lack of tantalum x rays in the observed γ-ray spectrum (high conversion coefficient of a M2 transition would lead to an x-ray peak with approximately 70% of the counts observed in a γ-ray peak). However, M1 or E2 assignments cannot be unambiguously excluded.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative I_γ



$^{188}_{73}Ta_{115}$