Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

S(p)=−1453 *15*; Q(α)=3755 (syst) *424* 2017Wa10
Q(ε)=10242 (syst) *423*; S(2p)=133 *15*; Q(εp)=8498 (syst) *359* 2017Wa10
S(p): Additional information 1.
Q(α): Additional information 2.
The data given here are from the study of 2007Pa27. In an earlier study, 1999Uu01 report $T_{1/2}$ and E(p) values for the ^{155}Ta decay. However, 2007Pa27 do not confirm them; and they are not included here. However, they are included in a survey of proton-emitting nuclides by 2002So02 and in a theoretical study of Lu and Ta proton emitters by 1999La23.
^{155}Ta: produced as the α-decay product of ^{159}Re, which was produced in the ^{106}Cd(^{58}Ni,p4n) reaction, with E(^{58}Ni)=300 MeV, on a 1.1 mg/cm^{2}thick self-supporting ^{106}Cd target (enrichment=96.5%). Reaction products were separated using the gas-filled separator RITU and implanted into a DSSD device in the GREAT spectrometer. Measured α, protons, and temporal correlations between the implanted recoil nuclides and their subsequent decays.

^{155}Ta Levels

E(level)	J^π	$T_{1/2}$	Comments
0+x	$11/2^-$	2.9 ms *+15−11*	%p=100 %p: The calculated (1997Mo25) half-life for β emission is ≈0.33 s, which suggests that this branch does not compete to any significant extent with proton emission. E(level): in addition to $h_{11/2}$, the π $s_{1/2}$ and π $d_{3/2}$ orbitals are also expected at low energies in ^{155}Ta, but these latter two should have a much shorter $T_{1/2}$ value and be produced with a smaller cross section and hence may have escaped detection. Thus the π $h_{11/2}$ orbital, which is the one from which proton emission takes place, may not Be the g.s.. However, the agreement of the deduced S(p) value with systematics suggests that it is close to the g.s. (i.e., x is likely to be small). J^π: measured $T_{1/2}$ value is consistent with l=5 proton emission. It is much larger that that expected for l=0 and l=2 emission, the other two possibilities based on the available proton orbitals. Since the g.s. of the daughter nuclide, ^{154}Hf, has $J^\pi=0^+$, this establishes π $h_{11/2}$ as the configuration of the initial state. $T_{1/2}$: from 2007Pa27.