^{148}Ho εp decay (9.59 s) 1988Ni02,2001Xu06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181, 1 (2022)	9-Mar-2022

Parent: ^{148}Ho: E=0.0+x; $J^\pi=(5)^-$; $T_{1/2}$=9.59 s *15*; Q(εp)=5460 *80*; %εp decay=0.08 *2*

^{148}Ho-Q(εp): From 2020Wa16.

^{148}Ho-J^π: Adopted value (2014Ni05), from shell-model prediction of 2010Ko12 with parity from log *ft*=5.3 to negative parity level at 2348 in ^{148}Dy daughter. 1988Ni02 used (6^-) from literature for this isomeric level.

^{148}Ho-$T_{1/2}$: Adopted value (2014Ni05), from 1989Ta11.

^{148}Ho-%εp decay: From 1988Ni02 who list 0.08 % *+1−2*, according to whom the positive uncertainty is pure statistical while the negative uncertainty also includes conservative estimates of the contribution from the (1^+) g.s. of the precursor to the number of protons, as well as the γ-rays intensity corrections due to summing in the close counting geometries.

1988Ni02: ^{148}Ho precursor produced from ^{94}Mo(^{58}Ni,3pn), E=257 MeV reaction al Lawrence Berkeley SuperHILAC. Evaporation residues were collected with a tantalum catcher at about 3000°C located inside a surface ionization source. By diffusing out of the catcher and after ionization, product ions were accelerated to 50 keV and mass separated in the on-line isotope separator OASIS. Single isobaric chains thus selected were transported by a mylar tape system to the detection station composed of a ΔE-E Si particle telescope, a HPGe and two n-type Ge detectors, and a ΔE_β plastic detector. Proton, γ, x-rays and positron spectra were collected in single and various coincidence modes, including proton decay activity for $T_{1/2}$ analysis. Completed statistical model calculations for ^{148}Ho.

2001Xu06: identified three gammas in ^{147}Tb in coincidence with 2.5-6.4 MeV protons from ^{148}Ho (β-delayed p) precursor and measured their relative intensities.

Data analysis of 1988Ni02 identified the ^{148}Ho precursor (from x rays) and measured 2-7 MeV unresolved proton spectrum with a sigle component proton half-life of 8.2 s *6* coming mainly from the 9.6 s, $(5)^-$ isomer of ^{148}Ho, indicationg that this is the main contributor to this proton decay; plus possible contribution from the 2.2 s, (1^+) g.s. of the same precursor; and plus the contribution from the 4.6 s, 0^+ g.s. of ^{148}Er precursor.

^{147}Tb Levels

E(level)†	J^π†
0.0	$(1/2^+)$
50.6	$(11/2^-)$
253.2	$(3/2^+)$
354.0	$(5/2^+)$
719.2	$(7/2^+)$

† From Adopted Levels.

γ(^{147}Tb)

E_γ†	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π
100.7	105 *30*	354.0	$(5/2^+)$	253.2	$(3/2^+)$
253.4	100 *15*	253.2	$(3/2^+)$	0.0	$(1/2^+)$
365.2	45 *15*	719.2	$(7/2^+)$	354.0	$(5/2^+)$

† From Adopted Gammas.

‡ Relative intensities measured by 2001Xu06.

^{148}Ho εp decay (9.59 s) 1988Ni02,2001Xu06 (continued)

Delayed Protons (^{147}Tb)

Particle normalization: From 1988Ni02 who list 0.08 % *+1−2*, according to whom the positive uncertainty is pure statistical while the negative uncertainty also includes conservative estimates of the contribution from the (1$^+$) g.s. of the precursor to the number of protons, as well as the γ-rays intensity corrections due to summing in the close counting geometries.

E(^{147}Tb)	I(p)†‡	Comments
0.0		
50.6	89 *20*	I(p): 1988Ni02 list proton relative intensity for g.s.+50.6, I_p(g.s.+50.6)=89 *20*, and calculated value I_p(50.6)=94.5.
253.2	≤8	I(p): 1988Ni02 list 3 *5* and calculated value 0.8.
354.0	≤5	I(p): 1988Ni02 list 1 *4* and calculated value 1.7.
719.2	7 *4*	I(p): 1988Ni02 list calculated value 2.3.

† Relative values normalized to 100 for the sum of intensities of all proton decay branches.
‡ For absolute intensity per 100 decays, multiply by 0.0008 *2*.

^{148}Ho εp decay (9.59 s) 1988Ni02,2001Xu06

Decay Scheme