^{86}Mo ε decay (19.1 s) 2005Ka39,1994Sh07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 124, 1 (2015)	30-Nov-2014

Parent: ^{86}Mo: E=0; $J^\pi=0^+$; $T_{1/2}$=19.1 s *3*; Q(ε)=5023 *7*; %ε+%β^+ decay=100.0

^{86}Mo-Q(ε): From 2012Wa38.

2005Ka39: ^{86}Mo produced by a 150-170 MeV ^{32}S beam impinging on a ^{nat}Ni target. The reaction products were separated using the IGISOL facility and implanted into a collector tape. Two HPGe detectors and a plastic scintillator were placed next to the implantation position and two low-energy Ge detectors and a magnetic conversion-electron spectrometer (ELLI) were placed at a second detector station. Measured Eγ, Iγ, $\gamma\gamma$ coin, conversion electrons.

1994Sh07: ^{86}Mo produced in reactions ^{54}Fe(^{35}Cl,p2nγ) E=103 MeV, and ^{58}Ni(^{32}S,2p2nγ) E=120 MeV; identification by (x ray)γ- and $\beta\gamma$ coin and cross bombardment.

The decay scheme of ^{86}Mo to ^{86}Nb does not seem complete in view of possible missing higher levels (above the currently known level at 236+x) and high Q value, thus Iγ/100 decays, ε feedings and log *ft* values cannot be deduced.

^{86}Nb Levels

E(level)	J^π †	$T_{1/2}$	Comments
0+x	($0^-,1^-,2^-$)		Additional information 1. J^π: (E1) γ from ($1^+,2^+$). 1994Sh07 assigned ($0^+,1^+,2^+$) based on (M1+E2) assignment for γ from ($1^+,2^+$).
49.96+x *15*	($1^+,2^+$)	68 ns *2*	J^π: (M1+E2) γ from (1^+). 2^+ seems less likely from some evidence of ε feeding to this level (from in-out intensity balance), however, the decay scheme, as proposed by 1994Sh07, cannot be considered as complete in view of a large gap between Q(β^+) and highest level proposed in this decay scheme. 1994Sh07 assign (1^+). $T_{1/2}$: from β(49.8γ)(t); uncertainty is statistical (1994Sh07).
97.47+x *25*	(1^+)		J^π: probable (allowed) ε feeding from 0^+.
236.86+x *18*	(0 to 4^+)		J^π: γ to ($1^+,2^+$). 1994Sh07 assign ($0^+,1^+$), assuming that this level is fed by ε transition.

† From Adopted Levels.

ε,β^+ radiations

E(decay)	E(level)	Comments
(2.5×10^3† *25*)	97.47+x	Direct feeding to the 97+y is suggested by observed B(47.3γ+49.8γ) coin with β^+ end-point energy=3.9 MeV *4*.

† Estimated for a range of levels.

γ(^{86}Nb)

E_γ ‡	I_γ #	E_i(level)	J^π_i	E_f	J^π_f	Mult. †	α @	Comments
47.5 *2*	27 *4*	97.47+x	(1^+)	49.96+x	($1^+,2^+$)	(M1)	1.89 *4*	α(K)exp=1.8 *3* (2005Ka39) α(K)=1.65 *3*; α(L)=0.197 *4*; α(M)=0.0347 *7*; α(N+..)=0.00534 *10* α(N)=0.00506 *10*; α(O)=0.000283 *6* Mult.: 1994Sh07 assign M1 based on α(K)exp=2.7 *4*.
49.95 *15*	58 *4*	49.96+x	($1^+,2^+$)	0+x	($0^-,1^-,2^-$)	(E1)	0.889 *15*	α(K)exp=0.65 *10* (2005Ka39) α(K)=0.777 *13*; α(L)=0.0931 *16*; α(M)=0.0162 *3*; α(N+..)=0.00239 *4* α(N)=0.00228 *4*; α(O)=0.0001067 *18*

Continued on next page (footnotes at end of table)

^{86}Mo ε decay (19.1 s) 2005Ka39,1994Sh07 (continued)

γ(^{86}Nb) (continued)

E_γ [‡]	I_γ [#]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [†]	α [@]	Comments
97.8	12 *3*	97.47+x	(1^+)	0+x	(0^-,1^-,2^-)	(E1)	0.1278	B(E1)(W.u.)=2.17×10^{-5} *7* Mult.: 1994Sh07 assign (M1+E2) based on α(K)exp=1.4 *2*. α(K)exp=0.09 *5* (2005Ka39) α(K)=0.1124 *16*; α(L)=0.01287 *18*; α(M)=0.00225 *4*; α(N+..)=0.000339 *5* α(N)=0.000322 *5*; α(O)=1.666×10^{-5} *24*
186.9 *1*	12 *3*	236.86+x	(0 to 4^+)	49.96+x	(1^+,2^+)	(E1,M1)	0.030 *11*	E_γ: from 2005Ka39. α(K)exp<0.04 (2005Ka39) α(K)=0.027 *10*; α(L)=0.0031 *12*; α(M)=0.00054 *21*; α(N+..)=8.E−5 *4* α(N)=8.E−5 *3*; α(O)=4.4×10^{-6} *18*

† From α(K)exp.

‡ Unweighted average from 2005Ka39 and 1994Sh07, unless noted otherwise.

From 2005Ka39.

@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^{86}Mo ε decay (19.1 s) 2005Ka39,1994Sh07

Decay Scheme

Intensities: Relative I_γ