^{95}Nb β^- decay (34.991 d) 1999BeZS,1999BeZQ

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, G. Mukherjee, A. A. Sonzogni	NDS 111, 2555 (2010)	30-Jun-2009

Parent: ^{95}Nb: E=0.0; J$^{\pi}$=9/2^{+}; $T_{1/2}$=34.991 d *6*; Q(β^-)=925.6 *5*; %β^- decay=100.0

Evaluation by R.G. Helmer, July 1998 including some general comments from previous evaluation (1993Bu08). This evaluation was done as part of a collaboration of evaluators from Laboratoire National Henri Becquerel (lnhb) in France; Physikalisch-Technische Bundesanstalt (ptb) in Germany; hms Sultan and aea Technology in the United Kingdom; Khlopin Radium Institute (kri) in Russia; Centro de Investigaciones Energeticas, Medioambientales, y Tecnologicas (CIEMAT) and Universidad Nacional a Distancia (UNED) in Spain; and Brookhaven National Laboratory (BNL), Lawrence Berkeley National Laboratory (LBNL), and Idaho National Engineering and Environmental Laboratory (INEEL) in the United States.

Measurements include: β^-'s and ce's (mag spect, pc, Si) (1963La06); see ^{95}Zr β^- decay for details (1974An22); γ's for a mixed 35-day and 3.61-d ^{95}Nb source and a mixed ^{95}Zr and ^{95}Nb source, Compton-suppressed Ge(Li), lead attenuator to enhance high-energy γ's (1976Ho04); γ's, Ge(Li), energy difference method (1979Gr01).

For previous evaluation, see 1991BaZS.

α: Additional information 1.

^{95}Mo Levels

E(level)	J$^{\pi}$ †	$T_{1/2}$ †
0.0	5/2^{+}	stable
204.116 *2*	3/2^{+}	751 ps *9*
765.803 *8*	7/2^{+}	

† From the ^{95}Mo Adopted Levels.

β^- radiations

The unobserved β transitions to the 786- and 820-keV states are 4th forbidden and unique 2nd forbidden, respectively. From the log *ft* systematics of 1998Si17, the feeding of these levels are expected to be $<1.0\times10^{-15}$% and $<1.0\times10^{-8}$%, respectively, and, therefore, are completely negligible.

Probability of K-shell autoionization=3.4×10^{-4} *4* (1976Ju02. Xγ-coin; NaI,Ge(Li)).

E(decay)	E(level)	Iβ^- †	Log *ft*	Comments
159.7 *5*	765.803	99.970 *6*	5.091 *5*	av Eβ=43.34 *15* E(decay): from 1963La06.
(721.5 *5*)	204.116	≤0.0020	≥12.7^{2u}	av Eβ=283.56 *20* Iβ^-: from log *ft* systematics (1998Si17) for unique 2nd forbidden transition. Intensity balance gives $I_{\beta-}$=0.014% *9*, this may suggest the mixing ratio is more nearly pure E2 which would give a smaller α_K(204).
(925.6 *5*)	0.0	0.030 *5*	11.2 *1*	av Eβ=321.94 *21* Iβ^-: from 1974An22; others: ≤0.11 from log *ft* systematics (1998Si17) where the log *ft*'s are >10.6 for 2nd forbidden transitions.

† Absolute intensity per 100 decays.

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$\gamma(^{95}Mo)$

E_γ †	I_γ ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α	Comments
204.1161 *17*	0.028 *9*	204.116	3/2+	0.0	5/2+	M1+E2	−0.62 *7*	0.052 *3*	ce(K)/(γ+ce)=0.0429; ce(L)/(γ+ce)=0.0055 *4*; ce(M)/(γ+ce)=0.00098 *4*; ce(N)/(γ+ce)=0.00017 *1* α(K)=0.0449 *23*; α(L)=0.0058 *4*; α(M)=0.00103 *7*; α(N)=0.000154 *9*; α(O)=7.5×10^{-6} *4* α(N+..)=0.000161 *10* I_γ: γ not observed in this decay, but is seen in ^{95}Tc ε decay. I_γ computed from ce_K(204)/ce_K(765)=0.010 *3* (1974An22), α_K(204)=0.046, and α_K(765)=0.00128. See comment on $I_{\beta-}$(204).
561.88	0.015 *3*	765.803	7/2+	204.116	3/2+	(E2)		0.00338 *5*	α(K)=0.00296 *5*; α(L)=0.000350 *5*; α(M)=6.26×10^{-5} *9*; α(N)=9.43×10^{-6} *14*; α(O)=5.00×10^{-7} *7* α(N+..)=9.93×10^{-6} *14* E_γ: the 204 and 561 γ energies are not consistent with the 765 γ energy; E_γ(204)+E_γ(561)-E_γ(765)= 0.19 keV *2*. The 765 and 204 values imply E_γ(561)=561.69. I_γ: from directly measured values of 0.015 *1* (1976Ho04) and 0.015 *6* (1977Me12); other: 0.011 *3* deduced from ce_K(561)/ce_K(765)=0.00025 *5* (1974An22), α_K(561)=0.0029, and α_K(765)=0.00128.
765.803 *6*	99.808 *7*	765.803	7/2+	0.0	5/2+	M1+E2	−0.14 *9*	0.001445 *21*	α=0.001445 *21*; α(K)=0.001272 *18*; α(L)=0.0001428 *20*; α(M)=2.55×10^{-5} *4* α(O)=2.22×10^{-7} *4*; α(N+..)=4.11×10^{-6}

† From 2000He14 evaluation for the 204 and 765 γ's and from 1976Ho04 for 561 γ from ^{95}Nb (3.61 h) β- decay.
‡ Absolute intensity per 100 decays.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays