^{93}Mo ε decay (6.85 h) 2009Ho07,1977Me03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

Parent: ^{93}Mo: E=2424.864 *21*; J$^{\pi}$=21/2^{+}; $T_{1/2}$=6.85 h *7*; Q(ε)=406 *4*; %ε decay=0.1169 *24*

^{93}Mo-%ε decay: See ^{93}Mo IT decay.

2009Ho07: 6.85 h ^{93}Mo obtained from 7.4 MeV/nucleon $^{86}Kr^{21+}$ bombardment of 99% enriched ^{13}C target; fragment separator; evaporation residues implanted In Pb foil; prompt γ-rays eliminated by 520 ns flight time; 14 HPGe detectors surrounding Pb foil (2 with BGO anti-Compton shields, 3 operated As low-energy photon spectrometers) At θ=30°, 52°, 90°, 128° and 150°; measured Eγ, Iγ, $\gamma\gamma$ coin (250 ns time Γ); jj-coupling shell model calculations.

1977Me03: thin Ge(Li) for Eγ<400, Compton suppressed Ge(Li) spectrometers; measured Eγ, Iγ.

^{93}Nb Levels

E(level)[†]	J$^{\pi}$[‡]
0	9/2^{+}
949.82[#] *3*	13/2^{+}
1335.15[#] *7*	17/2^{+}
1491.08[#] *7*	15/2^{+}
2180.14 *7*	(17/2)$^{-}$
2752.93 *7*	(19/2)$^{+}$

[†] From least-squares fit to Eγ.
[‡] From Adopted Levels.
[#] Band(A): $\pi g_{9/2}(\nu d_{5/2})^2$ states. Energies consistent with jj-coupling shell-model calculations by 2009Ho07.

ε radiations

E(decay)	E(level)	Iε[†]	Log *ft*	Comments
(78 *4*)	2752.93	0.120 *5*	4.99 *7*	εK=0.806 *5*; εL=0.156 *4*; εM+=0.0375 *11*
(651 *4*)	2180.14	<0.0015	>9.1^{1u}	εK=0.8574 *2*; εL=0.1158 *1*; εM+=0.02675 *3*

[†] Absolute intensity per 100 decays.

γ(^{93}Nb)

Iγ normalization: From Σ(I(γ+ce) to g.s.)=100% (g.s. feeding negligible; ΔJ=6).

E$_\gamma$ [†]	I$_\gamma$ [‡@]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult. [#]	δ [#]	α [&]	Comments
155.94 *3*	0.0136 *12*	1491.08	15/2$^+$	1335.15	17/2$^+$	[M1,E2]		0.15 *9*	α(K)=0.13 *7*; α(L)=0.018 *12*; α(M)=0.0032 *20*; α(N+..)=0.0005 *3* α(N)=0.0004 *3*; α(O)=1.9×10^{-5} *10* I$_\gamma$: weighted average of 0.010 *3* (1977Me03) and 0.014 *1* (2009Ho07).
385.30 *8*	0.056 *2*	1335.15	17/2$^+$	949.82	13/2$^+$	E2		0.01001	α(K)=0.00873 *13*; α(L)=0.001063 *15*; α(M)=0.000188 *3*; α(N+..)=2.84×10^{-5} *4* α(N)=2.70×10^{-5} *4*; α(O)=1.397×10^{-6} *20* E$_\gamma$: unweighted average of 385.38 *9* (1977Me03) and 385.22 *2* (2009Ho07).
541.29 *7*	0.061 *1*	1491.08	15/2$^+$	949.82	13/2$^+$	M1+E2	−0.104 *17*	0.00292 *4*	α=0.00292 *4*; α(K)=0.00258 *4*; α(L)=0.000289 *4*; α(M)=5.09×10^{-5} *8*; α(N+..)=7.90×10^{-6} *11* α(N)=7.46×10^{-6} *11*; α(O)=4.35×10^{-7} *6* E$_\gamma$: unweighted average of 541.22 *7* (1977Me03) and 541.35 *2* (2009Ho07).
572.796 *19*	0.056 *2*	2752.93	(19/2)$^+$	2180.14	(17/2)$^-$				
689.053 *19*	0.040 *1*	2180.14	(17/2)$^-$	1491.08	15/2$^+$				other Iγ: 0.07 *1* (1977Me03).
844.96 *6*	0.015 *1*	2180.14	(17/2)$^-$	1335.15	17/2$^+$				
949.81 *3*	0.117 *2*	949.82	13/2$^+$	0	9/2$^+$	E2		0.000812 *12*	α=0.000812 *12*; α(K)=0.000715 *10*; α(L)=8.05×10^{-5} *12*; α(M)=1.416×10^{-5} *20*; α(N+..)=2.19×10^{-6} α(N)=2.07×10^{-6} *3*; α(O)=1.182×10^{-7} *17* %Iγ=0.1169 *24* assuming recommended decay scheme normalization.
1261.91 *14*	0.033 *2*	2752.93	(19/2)$^+$	1491.08	15/2$^+$				E$_\gamma$,I$_\gamma$: from 2009Ho07; γ not reported by 1977Me03.
1417.75 *10*	0.031 *2*	2752.93	(19/2)$^+$	1335.15	17/2$^+$				

[†] Weighted average from from 2009Ho07 and 1977Me13, except As noted.
[‡] From 2009Ho07, except As noted. data from 1977Me03 are, typically, less precise but In excellent agreement.
[#] From Adopted Gammas.
[@] For absolute intensity per 100 decays, multiply by 0.999 *21*.
[&] 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.

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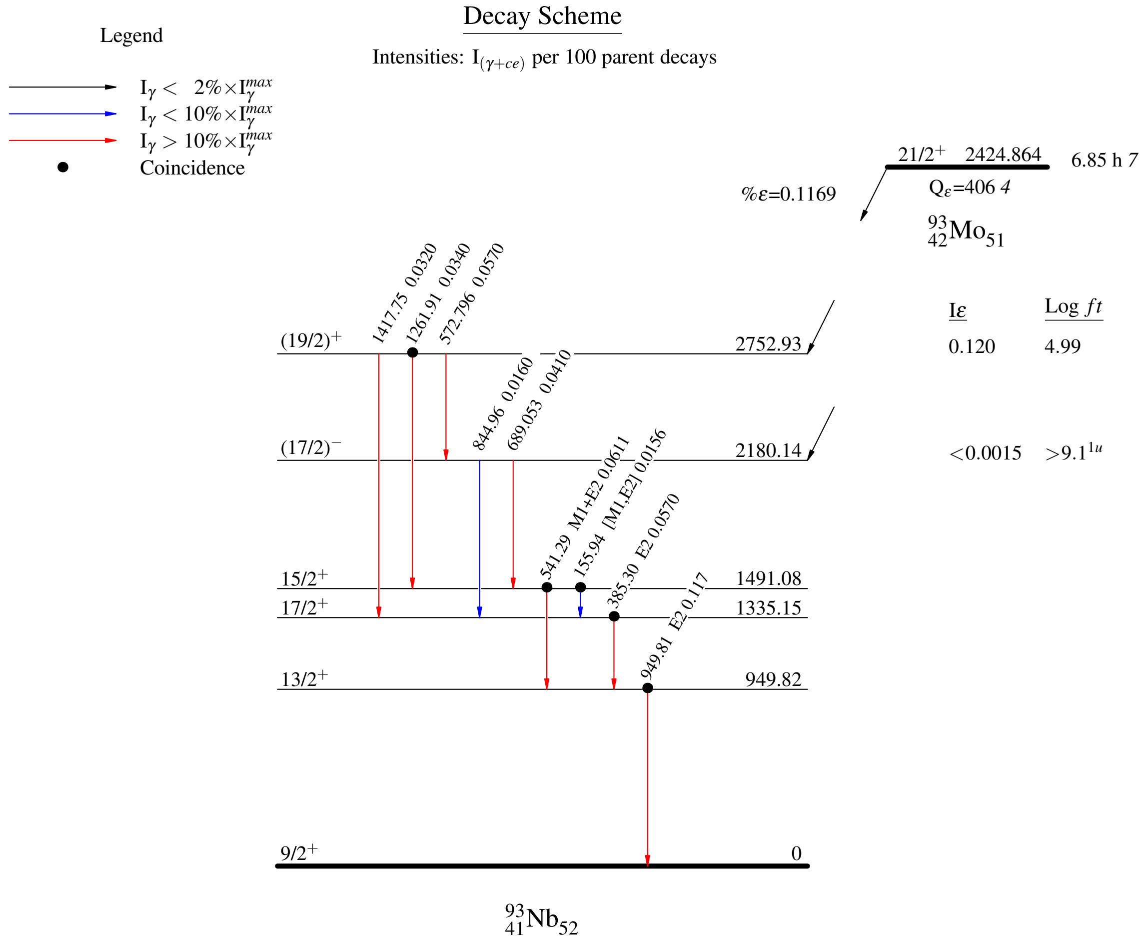

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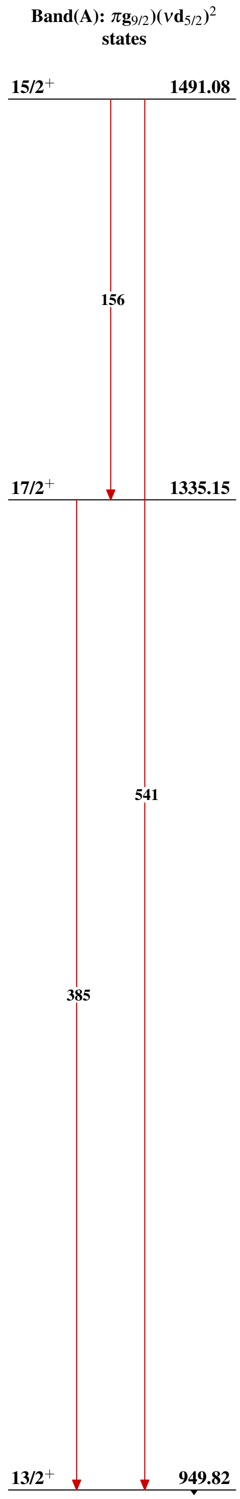

$^{93}_{41}Nb_{52}$