^{68}Co β^- decay (0.20 s) 2000Mu10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 113, 1735 (2012)	1-Mar-2012

Parent: ^{68}Co: E=0.0; J^π=(7$^-$); $T_{1/2}$=0.20 s *2*; Q(β^-)=1.155×10^4 *13*; %β^- decay=100.0

^{238}U(p,F) with E(p)=30 MeV. Isotopes separated using the Leuven ion-guide laser-ion source (LIGLIS) coupled to the LISOL mass separator. Measured Eγ, Iγ, $T_{1/2}$, β-γ and $\gamma\gamma$ coincidences using two HPGe detectors and three ΔE plastic detectors.

Others: 1999MuZZ, 2002Ko31 (details on LIGLIS).

α: Additional information 1.

^{68}Ni Levels

E(level)†	J$^\pi$‡	$T_{1/2}$‡	Comments
0.0	0$^+$	29 s *2*	%β^-=100.
2033.23 *20*	2$^+$	0.31 ps *5*	
2848.2 *3*	5$^-$	0.86 ms *5*	%IT=100
3120.1 *3*			
3443.6 *3*	(6$^-$,7$^-$)#		
3557.1 *3*	(6$^-$)#		
3934.5 *6*	(7)		

† From a least squares fit to Eγ's by evaluator.

‡ From the Adopted Levels.

Suggested configuration $\nu f_{5/2}^{-1} \nu g_{9/2}^{+1}$. Assuming a simple δ interaction the 3444 state is most likely 7$^-$ and the 3557 state is most likely 6$^-$ (2000Mu10).

β^- radiations

E(decay)	E(level)	Iβ^-†#	Log *ft*	Comments
(7.62×10^3 *13*)	3934.5	1.5 *2*	5.95 *9*	av Eβ=3527 *64*
(7.99×10^3 *13*)	3557.1	28 *2*	4.78 *7*	av Eβ=3711 *64*
(8.11×10^3 *13*)	3443.6	62 *5*	4.46 *7*	av Eβ=3766 *64*
(8.43×10^3‡ *13*)	3120.1	5 *3*	5.6 *3*	av Eβ=3924 *64*
(8.70×10^3‡ *13*)	2848.2	<10	>5.4	av Eβ=4057 *64*

† From an intensity balance at each level.

‡ Existence of this branch is questionable.

Absolute intensity per 100 decays.

γ(^{68}Ni)

Iγ normalization: From ΣI(γ+ce) (to g.s.)=100. Direct β^- feeding to the ground state is not expected (ΔJ=7).

E$_\gamma$	I$_\gamma$†&	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.@	α	Comments
113.5 *2*	20.2 *5*	3557.1	(6$^-$)	3443.6	(6$^-$,7$^-$)	(M1)	0.0334	α(K)=0.0299 *5*; α(L)=0.00304 *5*; α(M)=0.000428 *7*; α(N+..)=1.80×10^{-5} *3*
271.9# *2*	100 *2*	3120.1		2848.2	5$^-$			
323.6# *2*	88.4 *17*	3443.6	(6$^-$,7$^-$)	3120.1				

Continued on next page (footnotes at end of table)

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$\gamma(^{68}Ni)$ (continued)

E_γ	I_γ †&	E_i(level)	J_i^π	E_f	J_f^π	Mult.@	α	Comments
377.4 *5*	3.4 *3*	3934.5	(7)	3557.1	(6^-)	D		Statistics insufficient to determine $T_{1/2}$; placement by 2000Mu10 is based on the data of 2000Is01.
595.2 *2*	74.1 *17*	3443.6	(6^-,7^-)	2848.2	5^-			
708.9 *2*	46.9 *12*	3557.1	(6^-)	2848.2	5^-			From coincidence and $T_{1/2}$ measurements, this transition is a doublet also observed in ^{68}Co β^- decay (1.6 s).
815.0 *2*	230‡ *22*	2848.2	5^-	2033.23	2^+	E3	0.000928 *13*	α=0.000928 *13*; α(K)=0.000832 *12*; α(L)=8.36×10^{-5} *12*; α(M)=1.176×10^{-5} *17*; α(N+..)=4.92×10^{-7}
2033.2 *2*	230‡ *22*	2033.23	2^+	0.0	0^+	[E2]	0.000383 *6*	α=0.000383 *6*; α(K)=4.96×10^{-5} *7*; α(L)=4.81×10^{-6} *7*; α(M)=6.77×10^{-7} *10*; α(N+..)=0.000328 *5*

† Normalized to I(272γ) = 100.
‡ Determined from $\gamma\gamma$ coincidence.
# The ordering of the 272γ and 324γ is reversed in ^{198}Pt(^{76}Ge,Xγ) (2000Is01).
@ From the Adopted Gammas.
& For absolute intensity per 100 decays, multiply by 0.435 *42*.

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Decay Scheme

Intensities: I_γ per 100 parent decays