^{70}Co β^- decay (0.47 s) 2015Pr10,2000Mu10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan	NDS 136, 1 (2016)	1-Jul-2016

Parent: ^{70}Co: E=0+x; $J^\pi=(3^+)$; $T_{1/2}$=0.47 s *5*; Q(β^-)=1.23×10^4 *3*; %β^- decay=100.0

2000Mu10,1998Fr15: ^{70}Co activity from proton-induced fission of ^{238}U with E(p)=30 MeV. Fission products separated using laser ionization and mass separation with the LIGLIS-LISOL setup. Measured Eγ, Iγ, $\gamma\gamma$, $\beta\gamma$ using 2 HPGe detectors and three ΔE plastic scintillators.

2003Sa40,2003GrZZ: ^{70}Co activity from ^{nat}Ta(^{86}Kr,X) with E(^{86}Kr)=58 MeV/nucleon. Reaction products separated with the LISE2000 spectrometer and identified by E, ΔE, TOF measurements. Measured Eγ, Iγ, $\beta\gamma$ using four Clover-type EXOGAM HPGe detectors and a stack of four Si detectors, one a double-sided Si strip detector.

2015Pr10: ^{70}Co activity from ^{9}Be(^{76}Ge,X) with E(^{76}Ge)=130 MeV/nucleon. Reaction products separated with the A1900 fragment separator and identified with ΔE-TOF measurements. Measured Eγ, Iγ, $\beta\gamma$, $\gamma\gamma$, β(t), $\beta\gamma$(t) using 16 detectors of the segmented Ge array (SeGA) for γ's and a planar Ge double-sided strip detector for β's.

Other: 2016Li30, deduced level density as a function of excitation energy.

With a Q value of more than 12.3 MeV *3* and a highest observed level of 3.5 MeV, the evaluators consider this decay scheme to be incomplete and thus, do not provide a normalization or β-feeding intensities.

^{70}Ni Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	0^+	6.0[‡] s *3*	
1258.99	2^+		
1566.4	(0^+)	<70 ns	$T_{1/2}$: from time difference spectra between β-decay electrons and the 307.5γ (2015Pr10).
1866.45	(2^+)		
3510.1			

[†] From a least-squares fit to Eγ, by evaluators.
[‡] From the Adopted Levels.

γ(^{70}Ni)

2000Mu10 report a 1256.8 *2* transition which they find coincident with the 1259.6γ. In the higher statistics data of 2015Pr10, they report that the 1259.6γ was not observed to be self-coincident. However, in the ^{9}Be(^{72}Ni,^{70}Niγ),(^{73}Cu,^{70}Niγ) reaction, the 1259γ is observed to be self coincident and placed from a level at 2515.8 keV.

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
307.5	4.6 *4*	1566.4	(0^+)	1258.99	2^+	
607.4	14 *1*	1866.45	(2^+)	1258.99	2^+	I$_\gamma$: others: 36 *4* (2000Mu10), 35 *14* (2003Sa40).
[x]1256.8[‡] *2*	14 *4*					
1259.0	100 *7*	1258.99	2^+	0.0	0^+	I$_\gamma$: others: 100 *10* (2000Mu10), 100 *35* (2003Sa40).
1643.5	2.1 *6*	3510.1		1866.45	(2^+)	
1866.4	9.5 *8*	1866.45	(2^+)	0.0	0^+	E$_\gamma$,I$_\gamma$: not observed by 2003Sa40, attributed to a much weaker population of this isomer in their reaction. I$_\gamma$: other: 27 *4* (2000Mu10).
1943.7	0.7 *2*	3510.1		1566.4	(0^+)	

[†] From 2015Pr10, except where noted. Values from 2000Mu10 and 2003Sa40 are included in the comments. In each of these works, the authors quoted intensities relative to Iγ(608γ)=100. To enable a better comparison to the values from 2015Pr10, the evaluators have renormalized the 2000Mu10 and 2003Sa40 values to Iγ(1259γ)=100.

Continued on next page (footnotes at end of table)

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$\gamma(^{70}Ni)$ (continued)

‡ From 2000Mu10.
x γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ