Adopted Levels, Gammas

History

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

Q(β^-)=6588.3 *22*; S(n)=5311.5 *18*; S(p)=10287 *4*; Q(α)=−8993 *14* 2012Wa38
S(2n)=13552.0 *19*; S(2p)=2.563×10^4 *15* (2012Wa38).
α: Additional information 1.

^{70}Cu Levels

Cross Reference (XREF) Flags

A	^{70}Ni β^- decay	D	^{70}Zn(t,^{3}He)
B	^{70}Cu IT decay (33 s)	E	Coulomb excitation
C	^{70}Cu IT decay (6.6 s)		

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0‡	6$^-$	44.5 s *2*	AB DE	%β^-=100 Q=−0.285 *14*; μ=+1.3666 *5* J$^\pi$: from collinear laser spectroscopy (2010Vi07). T$_{1/2}$: from β(t); a three component exponential decay was used to account for the 6$^-$ ground state, 1$^+$ 243-keV isomer and a constant background (2004Va08). Others: 42 s *7* (1999Pr10), 52 s *4* (1975Re09), 42 s *3* (1971Ta03). μ: from collinear laser spectroscopy (2010Vi07). Other: (+)1.50 *11* from LASER spectroscopy (2002We03). Q: from collinear laser spectroscopy (2010Vi07).
101.1 *3*	3$^-$	33 s *2*	ABCDE	%β^-=52 *9*; %IT=48 *9* Q=−0.13 *4*; μ=−3.3641 *15* J$^\pi$: from collinear laser spectroscopy (2010Vi07). T$_{1/2}$: from γ(t) of the 209γ, 387γ, 553γ and 708γ from the 3247-keV level in ^{70}Zn (2004Va08). %β^-,%IT: from 2004Va07,2004Va08. μ: from collinear laser spectroscopy (2010Vi07). Other: (−)3.50 *12* from LASER spectroscopy (2002We03). Q: from collinear laser spectroscopy (2010Vi07). E(level): confirmed in high-precision mass measurement where 100.7 keV *26* was deduced (2004Va07).
228.5‡ *4*	4$^-$		A DE	J$^\pi$: Coulomb excitation from 6$^-$ ground state; member of ((π 2p$_{3/2}$)(ν 1g$_{9/2}$)) multiplet. B(E2) (6$^-$ to 4$^-$)=0.0069 *9* (2011Ra42). B(E2) (3$^-$ to 4$^-$)=0.0073 *10* (2011Ra42).
242.6 *5*	1$^+$	6.6 s *2*	A C E	%β^-=93.2 *9*; %IT=6.8 *9* Q=−0.12 *3*; μ=+1.7779 *15* J$^\pi$: from collinear laser spectroscopy (2010Vi07). T$_{1/2}$: from β(t); a three component exponential decay was used to account for the 6$^-$ ground state, 1$^+$ 243-keV isomer and a constant background (2004Va08). Others: 4 s *1* (1975Re09) and 5 s *1* (1971Ta03). %β^-,%IT: from 2004Va07,2004Va08. μ: from collinear laser spectroscopy (2010Vi07). Other: +1.86 *4* from LASER spectroscopy (2002We03). Q: from collinear laser spectroscopy (2010Vi07).
320.7 *5*	(2$^+$)		A	J$^\pi$: from similarity to ^{68}Cu, possible configuration=((π 2p$_{3/2}$)(ν 2p$_{1/2}$)$^{-1}$) (2004Va08).
368.9 *4*	(2$^-$)		A D	J$^\pi$: 126.5γ to 1$^+$, 140γ to 4$^-$.
511‡ *3*	5$^-$		DE	J$^\pi$: Coulomb excitation from 3$^-$ isomeric state; member of ((π 2p$_{3/2}$)(ν 1g$_{9/2}$)) multiplet. B(E2) (6$^-$ to 5$^-$)≤ 0.0011 *2* (2011Ra42). B(E2) (3$^-$ to 5$^-$)=0.0136 *15* (2011Ra42).

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Adopted Levels, Gammas (continued)

^{70}Cu Levels (continued)

E(level)†	Jπ	XREF	Comments
628.3? *5*		A	
697.7 *5*	(1+)	A	Jπ: log *ft*≈5.1 from 0+ parent.
706.1? *5*		A	
938.8 *5*		A	
1278.4 *5*	(1+)	A	Jπ: log *ft*≈4.2 from 0+ parent.
1520.4 *5*	(1+)	A	Jπ: log *ft*≈4.6 from 0+ parent.
1980.1 *5*	(1+)	A	Jπ: log *ft*≈4.8 from 0+ parent.

† From a least-squares fit to Eγ, by evaluators.
‡ Multiplet of states arising from the $((\pi\ 2p_{3/2})(\nu\ 1g_{9/2}))$ configuration.

γ(^{70}Cu)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	α	Comments
101.1	3−	101.1 *3*	100	0.0	6−	[M3]	5.35 *11*	α(K)=4.57 *9*; α(L)=0.682 *14*; α(M)=0.0969 *20*; α(N)=0.00234 *5* B(M3)(W.u.)=4.9 *10* Eγ: from ^{70}Cu IT decay (33 s).
228.5	4−	127.4 *2*	100	101.1	3−	[M1]	0.0281	α(K)=0.0252 *4*; α(L)=0.00258 *4*; α(M)=0.000364 *6*; α(N)=1.084×10−5 *16*
242.6	1+	141.3	100	101.1	3−	[M2]	0.1681	α(K)=0.1488 *21*; α(L)=0.01689 *24*; α(M)=0.00239 *4*; α(N)=6.78×10−5 *10* B(M2)(W.u.)=2.9×10−7 *4* Eγ: from ^{70}Cu IT decay (6.6 s).
320.7	(2+)	78.3 *1*	100	242.6	1+	[M1]	0.1042	α(K)=0.0931 *14*; α(L)=0.00968 *14*; α(M)=0.001362 *20*; α(N)=4.02×10−5 *6*
368.9	(2−)	126.5 *2*	1.0×10^2 *8*	242.6	1+	[E1]	0.0270	α(K)=0.0242 *4*; α(L)=0.00241 *4*; α(M)=0.000336 *5*; α(N)=9.78×10−6 *15*
		140.4 *6*	7.×10^1 *4*	228.5	4−	[E2]	0.169 *4*	α(K)=0.150 *4*; α(L)=0.0166 *4*; α(M)=0.00230 *5*; α(N)=5.96×10−5 *13*
		267.8 *4*	90 *18*	101.1	3−	[M1]	0.00426	α(K)=0.00382 *6*; α(L)=0.000385 *6*; α(M)=5.42×10−5 *8*; α(N)=1.639×10−6 *24*
511	5−	511 *3*	100	0.0	6−			Eγ: from Coulomb excitation.
628.3?		385.7# *5*	100	242.6	1+			
697.7	(1+)	377.2 *1*	78 *15*	320.7	(2+)			
		455.1 *1*	100 *15*	242.6	1+			
706.1?		385.7# *5*	100	320.7	(2+)			
938.8		232.8‡# *3*	14 *10*	706.1?				
		618.4 *2*	1.0×10^2 *3*	320.7	(2+)			
		696.1 *1*	72 *12*	242.6	1+			
1278.4	(1+)	339.6 *1*	25 *4*	938.8				
		581.1 *2*	3.5 *9*	697.7	(1+)			
		650.1‡# *2*	9.6 *16*	628.3?				
		956.9 *3*	2.8 *15*	320.7	(2+)			
		1035.6 *2*	100 *7*	242.6	1+			
1520.4	(1+)	1152.3 *4*	20 *10*	368.9	(2−)	[E1]	1.14×10−4	α(K)=7.98×10−5 *12*; α(L)=7.83×10−6 *11*; α(M)=1.100×10−6 *16*; α(N)=3.37×10−8 *5*
		1277.6 *2*	100 *17*	242.6	1+			

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Adopted Levels, Gammas (continued)

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

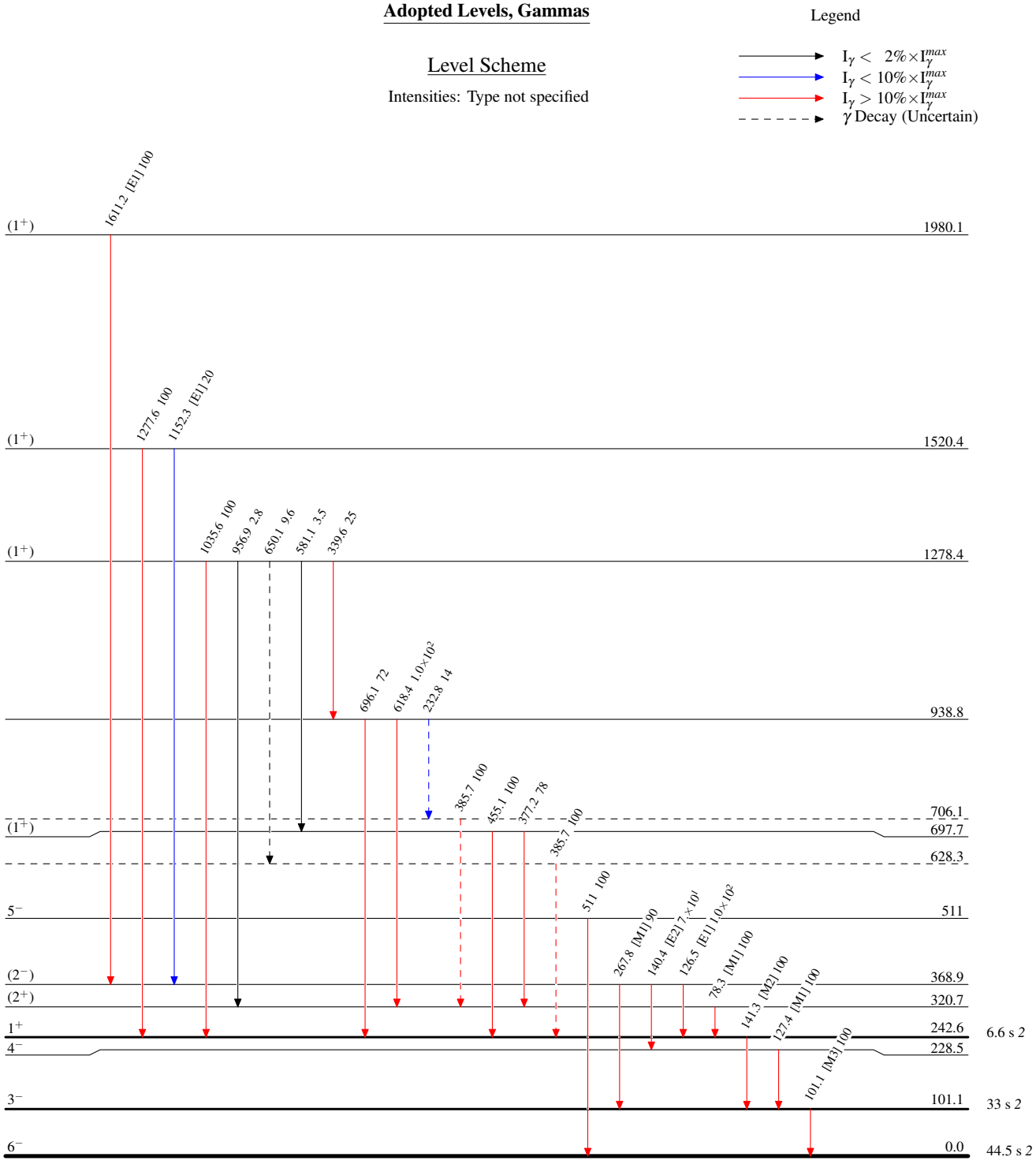
E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α	Comments
1980.1	(1^+)	1611.2 *3*	100	368.9	(2^-)	[E1]	3.95×10^{-4}	α(K)=4.51×10^{-5} *7*; α(L)=4.41×10^{-6} *7*; α(M)=6.20×10^{-7} *9*; α(N)=1.90×10^{-8} *3*

[†] From ^{70}Ni β^- decay, except where noted.
[‡] Ordering of the 650γ-386γ cascade and the 233γ-386γ cascade could not be determined. A reverse ordering resulting in the 628-keV level moving to 892.5 keV and the 706-keV level moving to 553.5-keV is also possible.
[#] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified



$^{70}_{29}Cu_{41}$