^{62}Co β^- decay (1.54 min) 1970Jo12,1969Es03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alan L. Nichols, Balraj Singh, Jagdish K. Tuli	NDS 113, 973 (2012)	15-Apr-2012

Parent: ^{62}Co: E=0.0; $J^\pi=(2)^+$; $T_{1/2}$=1.54 min *10*; $Q(\beta^-)$=5315 *20*; $\%\beta^-$ decay=100.0

^{62}Co-J^π,$T_{1/2}$: From Adopted Levels for ^{62}Co.

^{62}Co-$Q(\beta^-)$: From 2011AuZZ, 2003Au03.

1970Jo12 (also 1971JoZN thesis): ^{62}Co from $^{64}Ni(d,\alpha)$, enriched ^{64}Ni target, E=16 MeV, Ge(Li), plastic scintillator, identified ^{60}Cu, ^{61}Cu, ^{62}Cu and ^{61}Co as main impurities. Measured Eγ, Iγ, Eβ, Iβ, $\gamma\gamma$, $\beta\gamma$ coin, half-life of ^{62}Co g.s..

1969Es03: ^{62}Co from Ni(n,p), natural Ni target, E=14.5 MeV, Ge(Li) singles, NaI(Tl) for $\gamma\gamma$. Measured Eγ, Iγ, $\gamma\gamma$.

1969Wa16: ^{62}Co from $^{62}Ni(n,p)$ and $^{65}Cu(n,\alpha)$, 97.8% and 99.05% enriched ^{62}Ni target and natural Cu target, E=14.8 MeV, Ge(Li) singles, NaI(Tl) for $\gamma\gamma$ and $\beta\gamma$ coincidences, plastic scintillator for $\beta\gamma$ coincidences. Four γ rays assigned to ^{62}Co g.s. decay. Measured Eγ, Iγ, Eβ, Iβ, $\gamma\gamma$ and $\beta\gamma$ coin, half-life of ^{62}Co g.s..

1968Ki08: ^{62}Co from $^{62}Ni(n,p)$ and $^{65}Cu(n,\alpha)$; measured Eγ, Iγ, Eβ. Ge(Li) detector for γ rays.

1962Va23: measured half-life, Eβ, Iβ.

1960Pr05: measured Eβ, half-life of ^{62}Co g.s..

1949Pa01: identified ^{62}Co isotope, measured Eβ, half-life of ^{62}Co g.s..

Total decay energy of 5270 keV *49* deduced (by RADLIST code) from proposed decay scheme is in agreement with the expected value of 5315 keV *20*, indicating that decay scheme is complete.

^{62}Ni Levels

E(level)	J^π †
0.0	0^+
1172.9 *2*	2^+
2301.8 *4*	2^+
3059.2 *12*	3^+
3158.0 *6*	2^+
3257.7 *3*	2^+
3270.5 *7*	$1^+,2^+$
3370 *2*	1^+
3518.7 *12*	2^+
4063 *1*	$1^+,2^+$

† From Adopted Levels.

β^- radiations

E(decay)	E(level)	$I\beta^-$ †	Log *ft*	Comments
(1252 *20*)	4063	0.66 *8*	5.59 *7*	av Eβ= 473 *9*
(1796 *20*)	3518.7	1.7 *3*	5.81 *9*	av Eβ= 719 *9*
(1945 *20*)	3370	0.63 *18*	6.38 *13*	av Eβ= 788 *9*
(2045 *20*)	3270.5	1.91 *17*	5.99 *6*	av Eβ= 834 *9*
(2057 *20*)	3257.7	0.33 *17*	6.8 *2*	av Eβ= 840 *9*
(2157 *20*)	3158.0	2.8 *6*	5.92 *10*	av Eβ= 887 *9*
(2256 *20*)	3059.2	1.00 *25*	6.45 *12*	av Eβ= 933 *10*
(3013 *20*)	2301.8	24.3 *8*	5.60 *4*	av Eβ= 1292 *10* E(decay): 2.90×10^3 *20* (1969Wa16).
(4142 *20*)	1172.9	66.7 *11*	5.77 *3*	av Eβ= 1836 *10* E(decay): 4.05×10^3 *15* (1969Wa16), 4000 *200* (1975TiZW).
(5315‡ *20*)	0.0	<0.5	>8.4	$I\beta^-$: from 1970Jo12.

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β^- radiations (continued)

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

$\gamma(^{62}Ni)$

Iγ normalization: from Σ(I(γ+ce)) to g.s.=100, assuming negligible β^- feeding to the g.s..

Eγ[‡]	Iγ[‡b]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[a]	δ[a]	α[†]	Comments
1128.9 *3*	12.8 *20*	2301.8	2+	1172.9	2+	M1+E2	+3.19 *11*	1.82×10^{-4}	α(K)=0.0001616 *23*; α(L)=1.579×10^{-5} *23*; α(M)=2.22×10^{-6} *4*; α(N)=9.57×10^{-8} *14* α(IPF)=1.89×10^{-6} *3*
1172.9 *2*	100	1172.9	2+	0.0	0+	E2		1.72×10^{-4}	α(K)=1.501×10^{-4} *21*; α(L)=1.466×10^{-5} *21*; α(M)=2.06×10^{-6} *3*; α(N)=8.89×10^{-8} *13* α(IPF)=5.39×10^{-6} *8*
1886.3[#] *12*	0.5[#] *3*	3059.2	3+	1172.9	2+	M1(+E2)	−0.03 *+3−2*	2.68×10^{-4}	α(K)=5.40×10^{-5} *8*; α(L)=5.23×10^{-6} *8*; α(M)=7.37×10^{-7} *11* α(N)=3.20×10^{-8} *5*; α(IPF)=2.08×10^{-4} *3*
1985.1 *6*	2.1 *7*	3158.0	2+	1172.9	2+	(M1+E2)	+0.13 *8*	3.05×10^{-4}	α(K)=4.94×10^{-5} *7*; α(L)=4.78×10^{-6} *7*; α(M)=6.74×10^{-7} *10*; α(N)=2.93×10^{-8} *5* α(IPF)=2.50×10^{-4} *4*
2083[@] *2*	0.4[@] *2*	3257.7	2+	1172.9	2+				
2097[@] *1*	1.1[@] *2*	3270.5	1+,2+	1172.9	2+				
2301.9 *5*	17.7 *4*	2301.8	2+	0.0	0+	E2		5.04×10^{-4}	α(K)=3.97×10^{-5} *6*; α(L)=3.85×10^{-6} *6*; α(M)=5.42×10^{-7} *8*; α(N)=2.35×10^{-8} *4*; α(IPF)=4.59×10^{-4} *7*
2345.8 *12*	1.6 *4*	3518.7	2+	1172.9	2+	(M1+E2)	+0.44 *9*	4.59×10^{-4}	α(K)=3.72×10^{-5} *6*; α(L)=3.60×10^{-6} *6*; α(M)=5.08×10^{-7} *8*; α(N)=2.21×10^{-8} *4* α(IPF)=4.18×10^{-4} *8*
3158 *1*	1.0 *2*	3158.0	2+	0.0	0+				
3271.1[&] *10*	<0.35[&]	3270.5	1+,2+	0.0	0+				
3370 *2*	0.45 *20*	3370	1+	0.0	0+	D			
3519[@] *3*	0.10[@] *5*	3518.7	2+	0.0	0+				
4063[@] *1*	0.4[@] *1*	4063	1+,2+	0.0	0+				

† Additional information 1.
‡ Weighted average of 1968Ki08, 1969Es03, 1969Wa16 and 1970Jo12, except as noted.
# γ reported by 1970Jo12 only.

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^{62}Co β^- decay (1.54 min) 1970Jo12,1969Es03 (continued)

$\gamma(^{62}Ni)$ (continued)

[@] γ reported by 1969Es03 only.
[&] Upper limit of intensity defined by 1970Jo12; assigned to the 13.86-min isomer by 1969Es03.
[a] From Adopted Gammas.
[b] For absolute intensity per 100 decays, multiply by 0.832 *4*.

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Decay Scheme

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