^{65}Ni β^- decay 1987Ju05,1973Ra10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 111, 2425 (2010)	1-Aug-2009

Parent: ^{65}Ni: E=0; $J^\pi=5/2^-$; $T_{1/2}$=2.51719 h *26*; Q(β^-)=2137.9 *7*; %β^- decay=100.0

Additional information 1.

1990Lo03: Eγ, Iγ; 4$\pi\beta\gamma$ coincidences, Ge(Li).

1987Ju05: Eγ, Iγ, $T_{1/2}$; 4$\pi\beta\gamma$ coincidences, Ge(Li), ionization chamber.

1980RuZY: $T_{1/2}$ and γ emission probabilities for 33 radionuclides are discussed along with an assessment of data uncertainties.

1973Ra10: Eγ, Iγ; Ge(Li).

1971Me14,1980RuZY: Iγ, Iβ^-, $\beta\gamma$ coincidences and $T_{1/2}$; proportional and ionization counters.

1972Pa30: Eγ, Iγ, $\gamma\gamma$ coincidences; Ge(Li), NaI.

1963Cl06: Eγ, Iγ, $\gamma\gamma$ coincidences, $\gamma\gamma(\theta)$ and $T_{1/2}$; 4$\pi\beta$ counter, NaI.

1968Re04: ^{65}Ni $T_{1/2}$.

1977Ba64: ^{65}Ni $T_{1/2}$.

1964Fr04: Eγ, Iγ, Eβ^-, Iβ^-; magnetic spectrometer, NaI.

1965Sp07: Eγ, Iγ, $\gamma\gamma$ coincidences and $\gamma\gamma(\theta)$; Ge(Li), NaI.

1976Kr09: $\gamma(\theta)$ anisotropies from oriented nuclei; Ge(Li).

1968At03,1969Be28: β-γ circular polarization correlations; magnetic spectrometer, scintillators, Ge(Li).

Others: 1958Ha11, 1960Ja16, 1962Ba27.

Absolute intensities for 1482γ: 23.59% *14* (1987Ju05), 23.5% *4* (1980RuZY) and 21.95% *28* (1990Lo03). The first two show excellent agreement while the last one is lower by 7%. Further, the absolute intensities of 1990Lo03 are systematically lower than the 1987Ju05 values by 8-11% for other γ rays. There is good agreement between the intensities of 1973Ra10 and 1987Ju05.

^{65}Cu Levels

E(level)†	J^π‡
0	$3/2^-$
770.63 *13*	$1/2^-$
1115.55 *3*	$5/2^-$
1481.83 *4*	$7/2^-$
1623.44 *6*	$5/2^-$
1724.98 *6*	$3/2^-$

† From a least-squares fit to Eγ data.

‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(412.9 *7*)	1724.98	0.555 *13*	5.90 *1*	av Eβ=128.4 *4*
(514.5 *7*)	1623.44	0.89 *2*	6.03 *1*	av Eβ=165.8 *5*
650 *30*	1481.83	28.4 *2*	4.901 *4*	av Eβ=220.5 *5* E(decay): from 1964Fr04.
1020 *25*	1115.55	10.18 *13*	6.064 *6*	av Eβ=371.7 *5* E(decay): from 1964Fr04.
2140 *10*	0	60.0 *3*	6.576 *2*	av Eβ=875.4 *6* E(decay): from 1964Fr04.

† From γ intensity imbalance at each level.

‡ Absolute intensity per 100 decays.

^{65}Ni β^- decay 1987Ju05,1973Ra10 (continued)

$\gamma(^{65}Cu)$

Iγ normalization: From absolute Iγ(1482)=23.59% *14* (1987Ju05).

E_γ [‡]	I_γ [#&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	δ [@]	α [†]	Comments
366.27 *3*	20.37 *22*	1481.83	7/2$^-$	1115.55	5/2$^-$	M1+E2	−0.031 *5*	0.00202 *3*	α=0.00202 *3*; α(K)=0.00181 *3*; α(L)=0.000181 *3*; α(M)=2.55×10^{-5} *4*; α(N+..)=7.74×10^{-7} *11* α(N)=7.74×10^{-7} *11* (366γ)(1115γ)(θ): A_2=0.172 *6*, A_4=0.013 *10* (1965Sp07). Others: 1958Ha11, 1960Ja16, 1963Cl06. δ: −0.031 *5* or +9.4 *5* from analysis of $\gamma\gamma(\theta)$ data of 1965Sp07. The larger value is rejected from RUL. Other: −0.03 *3* from measured $\gamma(\theta)$ anisotropy from oriented nuclei (1976Kr09).
507.9 *1*	1.240 *19*	1623.44	5/2$^-$	1115.55	5/2$^-$	M1+E2	+0.20 *4*	0.000980 *19*	α=0.000980 *19*; α(K)=0.000880 *17*; α(L)=8.76×10^{-5} *17*; α(M)=1.232×10^{-5} *24*; α(N+..)=3.75×10^{-7} α(N)=3.75×10^{-7} *7* E_γ: from 1972Pa30. (507γ)(1115γ)(θ): A_2=−0.200 *35*, A_4=−0.013 *57* (1965Sp07). δ: −2.8 *3* or +0.20 *4* from analysis of $\gamma\gamma(\theta)$ data of 1965Sp07. The smaller value is preferred from RUL.
609.5 *1*	0.655 *17*	1724.98	3/2$^-$	1115.55	5/2$^-$	M1+E2	−0.08 *5*	0.000636 *10*	α=0.000636 *10*; α(K)=0.000571 *9*; α(L)=5.67×10^{-5} *9*; α(M)=7.97×10^{-6} *13*; α(N+..)=2.44×10^{-7} *4* α(N)=2.44×10^{-7} *4* E_γ: from 1972Pa30. (607γ)(1115γ)(θ): A_2=0.209 *69*, A_4=−0.160 *111* (1965Sp07). δ: −0.08 *5* or +4.8 *+26−13* from analysis of $\gamma\gamma(\theta)$ data of 1965Sp07. The larger value is rejected from RUL.
770.6 *2*	0.439 *30*	770.63	1/2$^-$	0	3/2$^-$	M1+E2	0.096 *7*	0.000384 *6*	α=0.000384 *6*; α(K)=0.000345 *5*; α(L)=3.41×10^{-5} *5*; α(M)=4.80×10^{-6} *7*; α(N+..)=1.470×10^{-7} *21* α(N)=1.470×10^{-7} *21*
852.7 *2*	0.41 *5*	1623.44	5/2$^-$	770.63	1/2$^-$				
954.5 *3*	<0.015	1724.98	3/2$^-$	770.63	1/2$^-$				Not observed by 1972Pa30.

Continued on next page (footnotes at end of table)

^{65}Ni β^- decay 1987Ju05,1973Ra10 (continued)

$\gamma(^{65}Cu)$ (continued)

E_γ[‡]	I_γ[#&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	α[†]	Comments
1115.53 *4*	65.4 *4*	1115.55	5/2$^-$	0	3/2$^-$	M1+E2	−0.450 *16*	0.000185 *3*	α=0.000185 *3*; α(K)=0.0001655 *24*; α(L)=1.631×10^{-5} *23*; α(M)=2.29×10^{-6} *4*; α(N+..)=1.058×10^{-6} α(N)=7.04×10^{-8} *10*; α(IPF)=9.87×10^{-7} *15* δ: −0.4 *+2−1* from measured $\gamma(\theta)$ anisotropy from oriented nuclei (1976Kr09). β-γ(CP) data, asymmetry A=0.23 *4* (1968At03) A=0.292 *37* (1969Be28) consistent with a 5/2−(β^-)5/2−(γ)3/2$^-$ cascade.
1481.84 *5*	100	1481.83	7/2$^-$	0	3/2$^-$	E2		0.000192 *3*	α=0.000192 *3*; α(K)=0.0001008 *15*; α(L)=9.92×10^{-6} *14*; α(M)=1.395×10^{-6} *20*; α(N+..)=8.01×10^{-5} α(N)=4.27×10^{-8} *6*; α(IPF)=8.00×10^{-5} *12*
1623.42 *6*	2.11 *6*	1623.44	5/2$^-$	0	3/2$^-$	(M1+E2)	−0.8 *+3−5*	0.000209 *9*	α=0.000209 *9*; α(K)=8.08×10^{-5} *17*; α(L)=7.94×10^{-6} *17*; α(M)=1.116×10^{-6} *24*; α(N+..)=0.000119 *8* α(N)=3.43×10^{-8} *7*; α(IPF)=0.000119 *8* Multipolarity, δ: from measured $\gamma(\theta)$ anisotropy from oriented nuclei (1976Kr09).
1724.92 *6*	1.69 *5*	1724.98	3/2$^-$	0	3/2$^-$	M1+E2		0.000244 *22*	α=0.000244 *22*; α(K)=7.26×10^{-5} *23*; α(L)=7.13×10^{-6} *23*; α(M)=1.00×10^{-6} *4*; α(N+..)=0.000163 *19* α(N)=3.08×10^{-8} *10*; α(IPF)=0.000163 *19* δ: −0.2 *4* or <−4.6 or >+2.3. Multipolarity, δ: from measured $\gamma(\theta)$ anisotropy from oriented nuclei (1976Kr09).

† Additional information 2.
‡ From 1973Ra10, except as noted.
# Relative intensity (1987Ju05).
@ From adopted gammas; supporting arguments from this data set based on $\gamma(\theta)$, $\gamma\gamma(\theta)$ and RUL are indicated.
& For absolute intensity per 100 decays, multiply by 0.2359 *14*.

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Decay Scheme

Intensities: I_γ per 100 parent decays