^{109}Cd ε decay

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev	NDS 137, 1 (2016)	31-May-2016

Parent: ^{109}Cd: E=0.0; J$^{\pi}$=5/2^{+}; $T_{1/2}$=461.9 d *4*; Q(ε)=215.5 *18*; %ε decay=100.0

^{109}Ag Levels

E(level)	J$^{\pi}$	$T_{1/2}$	Comments
0.0	1/2^{-}	stable	
88.0341 *11*	7/2^{+}	39.79 s *21*	$T_{1/2}$: from Adopted Levels of ^{109}Ag.

ε radiations

E(decay)	E(level)	Iε[†]	Log *ft*	Comments
(127.5 *18*)	88.0341	100	5.987 *15*	εK=0.8131 *10*; εL=0.1484 *8*; εM+=0.03845 *23*

[†] Absolute intensity per 100 decays.

γ(^{109}Ag)

There have been many precise measurements of the decay of ^{109}Cd to the 88.032 level of ^{109}Ag. Tabulated below are the measured values for Eγ, Iγ(88γ), α_T, K x ray/γ(88), εL/εK, εL+/εK and εM+/εL.

Other Eγ measurements: 1947Br05, 1950Co60, 1954Mo38, 1954Wa15, 1966En05, and 1968Ea01.

Other ce measurement: 1947Br05.

Eγ	Reference
88.008 *42*	1966Fr12
88.035 *6*	1967DiZZ
88.05 *5*	1967Li10
88.033 *42*	1967Pi05
88.041 *87*	1967Sc22
88.09 *3*	1968Fo03
88.21 *3*	1968Fu05
88.036 *8*	1969HeZY
88.036 *8*	1970Gr13
88.035 *6*	1970Ra37
88.023 *8*	1976Dr07
88.0341 *11*	1978He21
88.035 *4*	1978Mo22
88.0336 *10*	2000He14

Iγ(88γ)	α_T		Reference
3.57 *31*	27.0 *24*		1953Br73
3.89 *7*	24.7 *5*		1965Le03
3.97 *22*	24.2 *14*		1965Se08
3.29 *23*	29.4 *21*	a	1968Fo03
3.65 *5*	26.4 *4*		1973Le29
3.79 *7*	25.4 *5*		1976Dr07
3.65 *4*	26.4 *3*		1979Pl04
3.62 *2*	26.82 *14*		UVVVR &
3.65 *3*	26.40 *23*		IER &

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3.59 11         26.9 9        IMM &
3.70 6          26.0 5        KSRI &
3.60 2          26.78 8       LMRI &
3.57 10         27.0 8        NPL &
3.65 8          26.4 6        OMH &
3.675 18        26.21 15      1988Ba60 &
3.66 5          26.3 4        1989Hi01 &
3.68 4          26.2 5        1992ScZZ &
3.663 33        26.30 25      2006Ko27
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& from intra-lab comparisons in 1994Ra37
a from αK=12.7     9 and K/(L+M+N)=0.76 2
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 K  x ray/γ(88)
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23.8 7        1957Wa05
26.2 6        1965Le06
29.0 10       1966En05
22.2 6        1966Ja01
29.1 10       1966Fr12
30 4          1968Fo03
25.6 9        1972Ca16
27.0 3        1976Dr07
27.3 6        1979Pl04
27.3 3        1982HoZF
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 εL/εK        εL+/εK       εM+/εL        Reference
             -------     -------    -------     --------
0.28 3                                 1953De26
0.32 4                                 1954Be41
          0.24 4                       1957Wa05
0.195 5      0.228 3      0.17 5             1965Le06
0.232 15               0.205 20         1965Mo06
          0.26 4                       1966Du01
0.193 3      0.226 3      0.17 4             1970Go39
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E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[‡]	$I_{(\gamma+ce)}$[†]	Comments
88.0336 *10*	3.644 *16*	88.0341	$7/2^+$	0.0	$1/2^-$	E3	26.3 *4*	100	ce(K)/(γ+ce)=0.418 *7*; ce(L)/(γ+ce)=0.441 *7*; ce(M)/(γ+ce)=0.0903 *17* ce(N)/(γ+ce)=0.0141 *3*; ce(O)/(γ+ce)=5.11×10^{-5} *10* α(K)=11.41 *16*; α(L)=12.06 *17*; α(M)=2.47 *4*; α(N)=0.386 *6*; α(O)=0.001398 *20* E_γ: from relative wavelength measurement in 2000He14. Other values are given in the table above. I_γ: From I(γ+ce)=100 and α=26.3 *4*. Other values are given in the table above. Mult.: from ce data listed in the table above. Others: L1:L2:L3=0.148 *7*:0.86 *2*:1 (1980Da23); α(K)exp=11.4 *3* (1979Pl04); L1:L2:L3=0.159 *13*:0.860 *20*:1 and K/L/M/N=0.98 *5*:1:0.20 *1*:0.050 *5* (1978Sh08); α(K)exp=11.4 *3*, α(L1)exp=0.63 *13*, α(L2)exp=5.48 *18*, α(L3)exp=6.11 *20*, α(M)exp=2.40 *8* (1976Dr07); L1:L2=0.994 *12*, L1:L3=1.020 *14* and L2:L3=0.99 *2* (1975Ma32);

Continued on next page (footnotes at end of table)

^{109}Cd ε decay (continued)

$\gamma(^{109}Ag)$ (continued)

E_γ	E_i(level)	Comments
		L1:L2:L3=0.132 *8*:0.830 *20*:1 (1972Br02); α(K)exp=10.6 *5* (1970Ba37); K/(L+M+N)=0.76 *2* (1969Pl08); α(K)exp=12.7 *9*, and K/(L+M)=0.76 *2* (1968Fo03); α(K)exp=11.3 *4* K/(L+M)=0.866 *27* (1965Se08); α(K)exp=11.0 *3*, α(L)exp=11.7 *8* and (α(M)exp + α(N)exp)=2.0 *11* (1965Le06); K/L=0.95 *3* (1964Bo12); α(K)exp=10.3 *5* (1957Wa05); α(K)exp=9.5 *1* and K/(L+M+N)=0.80 *4* (1954Wa15); α(K)exp=8.6 *1* (1953Av25); α(K)exp=12.4 *10* and K/(L+M+N)=0.85 *2* (1953Br73). Double K-shell vacancy per K-shell internal conversion: 2.8×10^{-5} 7 (1977Va05), 1.02×10^{-5} 36 (1977Va05) and 1.53×10^{-4} 24 (1975Na01). Double photon decay: $I(\gamma\gamma)/I(\gamma)<6\times10^{-7}$ (1988Il01).

† Absolute intensity per 100 decays.

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^{109}Cd ε decay

Decay Scheme

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