

¹⁶³Ho ε decay (4570 y) 1997Ga12,1994Ya07,1992Ha15

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh		NDS 111, 1211 (2010)	12-Apr-2010

Parent: ¹⁶³Ho: E=0.0; J^π=7/2⁻; T_{1/2}=4570 y 25; Q(ε)=2.555 16; %ε decay=100.0

¹⁶³Ho-J^π,T_{1/2},Q(ε): [Additional information 1](#).

[Additional information 2](#).

1997Ga12 (also 1998Me13): measured N1, N2, M1, and M2 resolved x-ray lines with FWHM= 40 eV. Deduced Q(ε) and electron-neutrino mass limit (< 250 eV).

1994Ya07, 1988Ka20 (also 1986Ya17,1983Ya11): measured M x ray, deduced Q(ε), T_{1/2} (by isotope-dilution mass spectrometry), log ft, electron-neutrino mass limit.

1992Ha15, 1985Ha12 (also 1992Ha03,1985HaZO): measured x rays, deduced α(M)exp/α(N)exp, Q(ε), electron-neutrino mass limit.

1987Sp02 (also 1986SpZZ), 1985Sp01, 1983Ba32, 1981Be56: measured T_{1/2}, deduced Q(ε), neutrino mass limit.

1983Jo04 (also 1982An19): measured Auger electrons, x rays, deduced partial decay T_{1/2}, log ft, electron-neutrino mass limit.

1968Ho17 (also 1969HoZS): measured T_{1/2}, M/L ratio, deduced Q(ε).

1961Bj02, 1960Na10, 1954Ha19: measured T_{1/2}.

Theoretical calculations: 1994Re18, 1993Su01, 1988Ri08, 1985Ri05, 1985Ho25, 1983Ke07, 1983De24 (also 1982De52).

Analysis of ε data: 1985Qi01.

T_{1/2}: 4569 y 27 (1988Ka20,1994Ya07), 4570 y 25 (1983Ba32), 7000 y 2000 (1982An19,1983Jo04), 33 y 23 (1968Ho17), >500 y (1961Bj02), >1000 y (1960Na10), >20 y (1954Ha19). Weighted average of 1994Ya07 and 1983Ba32: 4570 y 25.

Q(ε): 2.600 50 and (2.800 50 for mass(neutrino)=0) (1997Ga12), 2.71 10 (original 2.710 +100-5 of 1994Ya07), 2.561 20 (1992Ha15), 2.511-2.572 (original 2.616-2.694 of 1992Ju01 corrected in 2003Wa32), 2.60 3 (1986Ya17) 2.56 5 (original 2.60 3 of 1985Ha12 corrected in 2003Wa32). Value recommended by 2003Au03 and 2009AuZZ: 2.555 16. It should be noted that Q(ε) and neutrino mass are correlated in the analysis.

Limits on electron neutrino mass: <250 eV (1997Ga12), <460 eV (1994Ya07), <225 eV (at 95% confidence limit) (1987Sp02), <1.3 keV (1982An19). A recent review article (2008Ot03) recommends this limit as <2 eV (95% confidence limit) from analyses of β spectrum of tritium decay.

¹⁶³Dy Levels

E(level)	J ^π
0.0	5/2 ⁻

ε radiations

E(decay)	E(level)	Iε [†]	Log ft	Comments
(2.555 16)	0.0	100	4.91 1	εM ⁺ =1.00 Log ft: from a log ft code of R.B. Firestone (LBNL). Others: 4.993 +30-1 (1994Ya07 for Q(ε)= 2.710 +100-5 and mass(neutrino)= 0.110 keV +350-110); 5.00 +6-1 (from log ft code of Firestone using Q(ε)= 2.710 +100-5 from 1994Ya07); 5.12 (1983Jo04, from comparison to a similar β transition in ¹⁶¹ Ho decay). Additional information 3 .

[†] Absolute intensity per 100 decays.