^{84}Zr ε decay 2000Do10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and M. Bostan	NDS 110,2815 (2009)	30-Sep-2009

Parent: ^{84}Zr: E=0.0; $J^\pi=0^+$; $T_{1/2}$=25.8 min *5*; Q(ε)=2472 *7*; %ε+%$β^+$ decay=100.0

^{84}Zr-Q(ε): from 2009AuZZ. Other: 2670 *220* (syst,2003Au03).

2000Do10: ^{58}Ni(^{28}Si,2p) E=97, 99 MeV (only ^{84}Zr was produced), ^{58}Ni(^{32}S,4p2n) E=135 MeV. E=97 MeV experiment was done with modified NORDBALL, and E=99 MeV and E=135 MeV were done with a setup of five Ge detectors and a low-energy photon spectrometer (Florida State University). Measured Eγ, Iγ, γγ coincidences.

1982Sa34:Ge(Li), FWHM=2.1 keV at 1.33 MeV, low-energy photon spectrometer, FWHM=400 eV at 5.9 keV. Measured Eγ, Iγ, γγ, Xγ.

1982Li17:Ge(Li), Si(Li), measured x-rays and γ-rays.

Others: 1982De36, 1983Sh27.

^{84}Y Levels

E(level)	J^π‡	$T_{1/2}$	Comments
0.0†	(6+)	39.5# min *8*	%ε+%$β^+$=100 %ε+%$β^+$: from Adopted Levels.
66.9† *4*	1+	4.6# s *2*	%ε+%$β^+$=100 Additional information 1. %ε+%$β^+$: from Adopted Levels. No γ decay to ^{84}Y g.s. was observed by 2000Do10.
112.50 *10*	(4+)	79# ns *2*	
157.40 *18*			J^π: (3+) from 2000Do10 (presumably from multipolarities) is not ADOPTED.
198.50 *17*			J^π: (2+) from 2000Do10 (presumably from multipolarities) is not ADOPTED.

† The ordering of the (6+) and 1+ states proposed by 2000Do10 is the same as that proposed by 2005Io02 (^{84}Sr(p,nγ) dataset), but obtained independently (except for the 112γ, the reactions and details of the level schemes are different). This supersedes the reversed ordering, with the 1+ as g.s., and with (5−) (instead of (6+)) for the 39.5-min activity (1997Tu02 and references therein).

‡ From Adopted Levels.

Adopted values (see Adopted Levels).

γ(^{84}Y)

I(112.5γ, per 100 decay of ^{84}Zr)=98.4% 44 measured by 1983Sh27 relative to I(1040γ, per 100 decay of ^{84}Y 39.5 min g.s.)=56.8% 2.

None of the γ's reported here was seen in (HI,xnγ) or in the radioactivity spectra from the target foil taken immediately after the beam was stopped (1994Ch01). The (HI,xnγ) reaction studied populates ^{84}Zr strongly.

E_γ	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α†	Comments
41.1 *2*	37 *4*	198.50		157.40				
44.9 *2*	48 *5*	157.40		112.50	(4+)			
112.5 *1*	100	112.50	(4+)	0.0	(6+)	E2	0.692	α(K)=0.581 *9*; α(L)=0.0926 *14*; α(M)=0.01590 *23*; α(N+..)=0.00208 *3* α(N)=0.00199 *3*; α(O)=8.77×10^{-5} *13* Mult.: adopted value (see Adopted Gammas).
131.6 *2*	28 *4*	198.50		66.9	1+			
x193.2#								
x320.0@ *1*	30 *4*							Eγ: 319.7 (1982Li17).

Continued on next page (footnotes at end of table)

^{84}Zr ε decay 2000Do10 (continued)

γ(^{84}Y) (continued)

E_γ	I_γ[‡]	E_i(level)	Comments
[x]372.9[@] *1*	41 *4*		
[x]400.5[#]			
[x]451.1[#]			
[x]557.0[@] *3*	20 *3*		
[x]600.0[@] *2*	20 *4*		
[x]666.7[@] *3*	39 *4*		E_γ: 666.4 (1982Li17).

[†] Additional information 2.
[‡] Intensities relative to 112γ (1982Sa34).
[#] From 1982Li17.
[@] From 1982Sa34.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ