^{78}Sr ε decay (160 s) 1997Mu02,1992Gr09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh	NDS 110, 1917 (2009)	30-Jun-2009

Parent: ^{78}Sr: E=0.0; $J^\pi=0^+$; $T_{1/2}$=160 s *8*; Q(ε)=3762 *11*; %ε+%$β^+$ decay=100.0

^{78}Sr-Q(ε): from 2009AuZZ, 2003Au03.

1997Mu02: The ^{78}Sr isotope produced in ^{54}Fe(^{28}Si,2p2n) reaction. Measured Eγ, Iγ, γγ, K x ray, isotopic half-life, two Ge detectors. The γγ coincidence spectra obtained with gates on 46.8γ and 103.5γ.

1992Gr09: Measured Eγ, Iγ, isotopic half-life.

1982Li17: Measured Eγ, x rays, isotopic half-life. Four γ rays reported at 46.9, 87.0, 243.5 and 268.3.

The level scheme is proposed only by 1997Mu02 from their γγ data.

Total decay energy of 1231 keV *20* calculated (by RADLIST code) from level scheme is much lower than the expected value of 3762 keV *11*. The decay scheme is not known well.

^{78}Rb Levels

E(level)[†]	J^π	$T_{1/2}$	Comments
0.0	$0^{(+)}$		
46.9 *2*	(1^-)	0.91 μs *4*	$T_{1/2}$: γγ(t) (1997Mu02).
103.4 *2*	$1^{(+)}$		
134.2 *2*			
290.3 *2*	(1)[‡]		
315.1 *2*	$(0^-,1)$[‡]		
504.7 *2*	$(0^-,1)$[‡]		
896.4? *3*			

[†] From least-squares fit to Eγ's, assuming Δ(Eγ)=0.2 keV for each γ ray, reduced χ^2=0.66.

[‡] Possible allowed or first forbidden ε+$β^+$ feeding from 0^+.

γ(^{78}Rb)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
24.8[‡]	≈5[‡]	315.1	$(0^-,1)$	290.3	(1)			I_γ: most of the transition intensity is expected to Be internally converted.
46.8	60 *6*	46.9	(1^-)	0.0	$0^{(+)}$	(E1)	0.882	α(K)=0.778 *11*; α(L)=0.0886 *13*; α(M)=0.01442 *21*; α(N+..)=0.001613 *23* α(N)=0.001556 *22*; α(O)=5.69×10^{-5} *8* Mult.: E1 suggested by 1997Mu02 based on level lifetime and transition probability. I_γ: quoted by 1992Gr09 from H. Grawe et al., 1981 Ann Rep hmi B373, 89 (1982). Additional information 1.
87.5	27 *1*	134.2		46.9	(1^-)			Additional information 3.
103.5	100 *5*	103.4	$1^{(+)}$	0.0	$0^{(+)}$	(M1)	0.1317	α(K)=0.1161 *17*; α(L)=0.01313 *19*; α(M)=0.00217 *3*; α(N+..)=0.000255 *4* α(N)=0.000245 *4*; α(O)=1.038×10^{-5} *15* Additional information 2.
156.2	11 *1*	290.3	(1)	134.2				Additional information 4.
181.1	25 *1*	315.1	$(0^-,1)$	134.2				Additional information 7.
187.1	29 *2*	290.3	(1)	103.4	$1^{(+)}$			Additional information 5.
189.8	16 *1*	504.7	$(0^-,1)$	315.1	$(0^-,1)$			Additional information 10.
211.9	55 *3*	315.1	$(0^-,1)$	103.4	$1^{(+)}$			I_γ: much weaker In 1997Mu02;≈15, estimated (evaluators)

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^{78}Sr ε decay (160 s) 1997Mu02,1992Gr09 (continued)

$\gamma(^{78}Rb)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						from level-scheme figure 3 of 1997Mu02. Additional information 8.
214.5	32 *2*	504.7	$(0^-,1)$	290.3	(1)	Additional information 11.
243.3	86 *4*	290.3	(1)	46.9	(1^-)	Additional information 6.
268.1	60 *3*	315.1	$(0^-,1)$	46.9	(1^-)	Additional information 9.
370.5	10 *1*	504.7	$(0^-,1)$	134.2		Additional information 12.
401.2[‡]	≈16[‡]	504.7	$(0^-,1)$	103.4	$1^{(+)}$	
457.7	30 *2*	504.7	$(0^-,1)$	46.9	(1^-)	Additional information 13.
793.0[@]	12 *1*	896.4?		103.4	$1^{(+)}$	Additional information 14.

[†] From 1992Gr09 unless otherwise stated. The gamma-ray energies listed by 1997Mu02 are in agreement with those from 1992Gr09, but consistently lower by about 0.2-0.3 keV. Numerical values of intensities were not listed by 1997Mu02, these were shown only in terms of width of arrows in the decay scheme drawing.

[‡] From 1997Mu02 only. Intensity estimated by the evaluators from width of arrows In figure 3 of 1997Mu02.

[#] 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.

[@] Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence