^{74}Rb ε decay (64.776 ms) 2003Pi08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Ameenah R. Farhan	NDS 107, 1923 (2006)	30-Apr-2006

Parent: ^{74}Rb: E=0.0; $J^\pi=0^+$; $T_{1/2}$=64.776 ms *30*; Q(ε)=10416.8 *45*; %ε+%β^+ decay=100.0

^{74}Rb-$T_{1/2}$: from weighted average of 64.761 ms *31* (2001Ba12,includes systematic uncertainty of 0.015 ms added in quadrature), 64.90 ms *9* (2002Oi02,2001Oi04), 64.77 ms *17* (2001Oi04, with gating at E_β>5.2 MeV), 72 ms *18* (2001Ga24), 60 ms *10* (1999Lo07), 64 ms *10* (1998Lo17), 64.9 ms *5* (1977Da04).

^{74}Rb-Q(ε): From mass measurement (2004Ke10). Other: 10414 *4* (2003Au03).

2003Pi08 (also 2002Zg01): ^{74}Rb produced in Nb(p,X) E= 500 MeV spallation reaction. The nuclei were ionized in a surface ionization source and mass separated in the ISAC on-line separator. At the experimental site, the ^{74}Rb activity was implanted into a moving conducting collector tape. Measured Eγ, Iγ, $\gamma\gamma$, ce, (ce)β coin using two Si(Li) diodes an HPGe detector in conjunction with two plastic scintillators for for β detection.

$T_{1/2}$ measurement: 2002Oi02, 2001Oi04, 2001Ba12, 2001Ga24, 1999Lo07, 1998Lo17, 1977Da04.

Survey and analysis of superallowed (0^+ to 0^+) β decays including that of ^{74}Rb to ^{74}Kr: 2005Ha27 (also 2005Ha65,2006Ha12), 2005Sa44.

^{74}Kr Levels

E(level)	J^π[†]
0	0^+
456 *1*	2^+
509 *1*	0^+
1204 *1*	(2^+)
1654? *1*	(0^+)
1742 *1*	(2^+)
4244? *1*	(1^+)

[†] From 'Adopted Levels'.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ [#]	Iε[#]	Log *ft*[†]	I($\varepsilon+\beta^+$)[†#]	Comments
(6173 *5*)	4244?	0.012 *2*	0.00012 *2*	6.19 *8*	0.012 *2*	av Eβ=2387.0 *23*; εK=0.009109 *24*; εL=0.001051 *3*; εM+=0.0002157 *6*
(8675[@] *5*)	1742	0.038 *7*	0.00012 *2*	6.49 *8*	0.038[‡] *7*	av Eβ=3610.3 *23*; εK=0.002850 *5*; εL=0.0003285 *6*; εM+=6.740×10^{-5} *12*
(8763 *5*)	1654?	0.052 *5*	0.00016 *2*	6.37 *5*	0.052 *5*	av Eβ=3653.6 *23*; εK=0.002756 *5*; εL=0.0003176 *6*; εM+=6.517×10^{-5} *12*
(9213[@] *5*)	1204	0.053 *16*	0.00014 *4*	6.48 *14*	0.053[‡] *16*	av Eβ=3875.2 *23*; εK=0.002334 *4*; εL=0.0002689 *5*; εM+=5.518×10^{-5} *10*
(9908 *5*)	509	0.043 *11*	9.0×10^{-5} *23*	6.74 *12*	0.043 *11*	av Eβ=4218.0 *23*; εK=0.001836 *3*; εL=0.0002116 *4*; εM+=4.341×10^{-5} *7*
(9961[@] *5*)	456	0.138 *18*	0.00028 *4*	6.25 *6*	0.138[‡] *18*	av Eβ=4244.1 *23*; εK=0.001804 *3*; εL=0.0002079 *4*; εM+=4.265×10^{-5} *7*
(10417 *5*)	0	99.32 *10*	0.1766 *18*	3.4899 *11*	99.50 *10*	av Eβ=4469.5 *23*; εK=0.0015583 *2*; εL=0.0001795 *3*; εM+=3.683×10^{-5} *6* superallowed β decay (see 2005Ha27 for detailed analysis). I($\varepsilon+\beta^+$): Total observed non-superallowed feeding is 0.336 *20* per 100 decays of ^{74}Rb; unobserved

Continued on next page (footnotes at end of table)

^{74}Rb ε decay (64.776 ms) 2003Pi08 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Comments
		non-superallowed feeding is estimated (from comparison of data with shell-model calculations) as 0.15 *10* per 100 decays of ^{74}Rb (2003Pi08).

† Deduced from γ intensities of 2003Pi08.
‡ Apparent feeding deduced from γ intensities. This feeding is likely to be due to unobserved γ rays from high-lying J=1,0 states. From ΔJ=2, d(π)=no; no direct β feeding is expected.
# Absolute intensity per 100 decays.
@ Existence of this branch is questionable.

γ(^{74}Kr)

E_γ	I_γ †#	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α@	$I_{(\gamma+ce)}$#	Comments
53 *1*	0.0038 *8*	509	0^+	456	2^+	[E2]	10.2	0.032 *7*	
456 *1*	0.250 *14*	456	2^+	0	0^+	E2		0.250 *14*	
509 *1*		509	0^+	0	0^+	E0		0.048 *5*	
695 *1*	0.008 *5*	1204	(2^+)	509	0^+	E2		0.008 *5*	
748 *1*	0.019 *5*	1204	(2^+)	456	2^+			0.019 *5*	
1198 *1*	0.052 *5*	1654?	(0^+)	456	2^+			0.052 *5*	
(1204)	0.026 *14*	1204	(2^+)	0	0^+	E2		0.026 *14*	I_γ: γ not observed directly since it coincides with with strong γ from ^{74}Ga decay; the intensity here is inferred from known branching ratio Iγ(1204)/Iγ(748).
1233 *1*	0.029 *4*	1742	(2^+)	509	0^+			0.029 *4*	
1286 *1*	0.009 *5*	1742	(2^+)	456	2^+			0.009 *5*	
4244 *1*	0.012 *2*	4244?	(1^+)	0	0^+			0.012 *2*	

† From I(γ+ce) In 2003Pi08 and α for expected mult.
‡ From 'Adopted Gammas'.
# 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.

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Decay Scheme

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