Adopted Levels, Gammas

History

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

Q(β^-)=−1.109×10^4 *syst*; S(n)=1.391×10^4 *syst*; S(p)=2653 *8*; Q(α)=−2915 *16* 2012Wa38

Note: Current evaluation has used the following Q record −11220 syst 13940 syst 2654 8 −2920 syst 2003Au03.

Δ(Q(β^-))=500, Δ(S(n))=150, Δ(Q(α))=310 (2003Au03).

Q(εp decay)=4420 *50* (2003Au03).

^{74}Rb isotope produced in the following reactions followed by mass-separation: 1975BoYS: ^{50}Cr(^{32}S,3p5n); 1977Da04,1979Ep01: spallation reaction using Nb(p,X) and La(p,X) reactions; 1996Jo17,2001Oi04,2002Oi02: ^{93}Nb(p,X) E=1 GeV; 1998Lo17: ^{92}Mo beam fragmentation; 1999Lo07,2001Ga24: Ni(^{92}Mo,X); 2001Ba12,2002Do08,2002Zg01: Nb(p,X).

Other reactions:

1991Ba01, 1989Le12: ^{58}Ni(^{16}O,p)(^{16}O,π^+)(^{16}O,π^-) E=94 MeV/nucleon, measured cross section and model calculations.

Mass measurements: 2004Ke14, 2004Ke10, 2002He23, 1982Au01, 1979Ep01.

A novel method is in progress at JYFL (see JYFL Accelerator News volume 14, No. 1, February 2006) to study level structure of ^{74}Rb through β-decay tagging method in reaction where Ca target is bombarded with a ^{36}Ar beam at energies just above the Coulomb barrier. Results of this study are not yet available but the 6$^+$ and 8$^+$ members of the g.s. (T=1) band may have been identified in this study according to an e-mail reply (March 20, 2006) from one of the researchers of this study.

Additional information 1.

^{74}Rb Levels

Cross Reference (XREF) Flags

A ^{40}Ca(^{40}Ca,αpnγ)

E(level)	J$^\pi$[†]	T$_{1/2}$	XREF	Comments
0.0[‡]	0$^+$	64.776 ms *30*	A	%ε+%β^+=100 J$^\pi$: Superallowed β transition (log *ft*=3.5) to 0$^+$. Identified as isospin=1, J^π=0$^+$ state. ^{74}Rb is expected to have two low-lying levels, one with isospin=1,J^π=0 and the other with isospin=0. From systematics (1973Ta30), T$_{1/2}$=2 s is estimated (1977Da04) for the isospin=0 level. A search of isomers for A=74 in this half-life range proved negative (1977Da04,1975Ra03,1978Al23). From β^- syst, 1975Ra03 estimated T$_{1/2}$=6 s for isospin=0 level. 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$_\beta$>5.2 MeV), 72 ms *18* (2001Ga24), 60 ms *10* (1999Lo07), 64 ms *10* (1998Lo17), 64.9 ms *5* (1977Da04).
478[‡]	(2$^+$)		A	
1006[#]	(3$^+$)		A	
1053[‡]	(4$^+$)		A	
1225[#]	(4$^+$)		A	
1489[#]	(5$^+$)		A	
1546[@]	(6$^+$)		A	
1793[&]	(7$^+$)		A	
1806[#]	(6$^+$)		A	
2241[@]	(8$^+$)		A	
2313[&]	(9$^+$)		A	
2972?			A	
3126[@]	(10$^+$)		A	
3137[&]	(11$^+$)		A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{74}Rb Levels (continued)

E(level)	J^{π}[†]	XREF	E(level)	J^{π}[†]	XREF	E(level)	J^{π}[†]	XREF	E(level)	J^{π}[†]	XREF
4091[&]	(13^+)	A	6517[&]	(17^+)	A	9654[&]	(21^+)	A	13376[&]	(25^+)	A
4177[@]	(12^+)	A	6686[@]	(16^+)	A	9881[@]	(20^+)	A	15699[&]	(27^+)	A
5216[&]	(15^+)	A	8006[&]	(19^+)	A	11411[&]	(23^+)	A	18478[&]	(29^+)	A
5360[@]	(14^+)	A	8193[@]	(18^+)	A	11701?[@]	(22^+)	A	21612[&]	(31^+)	A

[†] As proposed in ^{40}Ca(^{40}Ca,αpnγ) (2003Ol02) levels above g.s. The assignments are based on $\gamma\gamma(\theta)$(DCO) for selected γ rays, and band associations. Parentheses are added by the evaluators.
[‡] Band(A): T=1 band, g.s. band.
[#] Band(B): T=0 band, π3/2[312]ν3/2[312], $K^{\pi}=3^+$.
[@] Band(C): T=0 band, based on 6^+, $\pi g_{9/2}\otimes\nu g_{9/2}$.
[&] Band(D): T=0 band, based on $7^{(+)}$, $\pi g_{9/2}\otimes\nu g_{9/2}$.

$\gamma(^{74}Rb)$

E_i(level)	J_i^{π}	E_{γ}	E_f	J_f^{π}	Mult.[†]	E_i(level)	J_i^{π}	E_{γ}	E_f	J_f^{π}	Mult.[†]
478	(2^+)	478	0.0	0^+		4177	(12^+)	1051	3126	(10^+)	
1006	(3^+)	528	478	(2^+)	D	5216	(15^+)	1125	4091	(13^+)	Q
1053	(4^+)	575	478	(2^+)	Q	5360	(14^+)	1183	4177	(12^+)	
1225	(4^+)	219	1006	(3^+)	D	6517	(17^+)	1301	5216	(15^+)	
1489	(5^+)	265	1225	(4^+)	D	6686	(16^+)	1326	5360	(14^+)	
		483	1006	(3^+)	Q	8006	(19^+)	1489	6517	(17^+)	
1546	(6^+)	493	1053	(4^+)	Q	8193	(18^+)	1507	6686	(16^+)	
1793	(7^+)	304	1489	(5^+)	Q	9654	(21^+)	1648	8006	(19^+)	
1806	(6^+)	581	1225	(4^+)	Q	9881	(20^+)	1688	8193	(18^+)	
2241	(8^+)	695	1546	(6^+)	Q	11411	(23^+)	1757	9654	(21^+)	
2313	(9^+)	520	1793	(7^+)		11701?	(22^+)	1820[‡]	9881	(20^+)	
2972?		731[‡]	2241	(8^+)		13376	(25^+)	1965	11411	(23^+)	
3126	(10^+)	885	2241	(8^+)		15699	(27^+)	2323	13376	(25^+)	
3137	(11^+)	824	2313	(9^+)		18478	(29^+)	2779	15699	(27^+)	
4091	(13^+)	954	3137	(11^+)		21612	(31^+)	3134	18478	(29^+)	

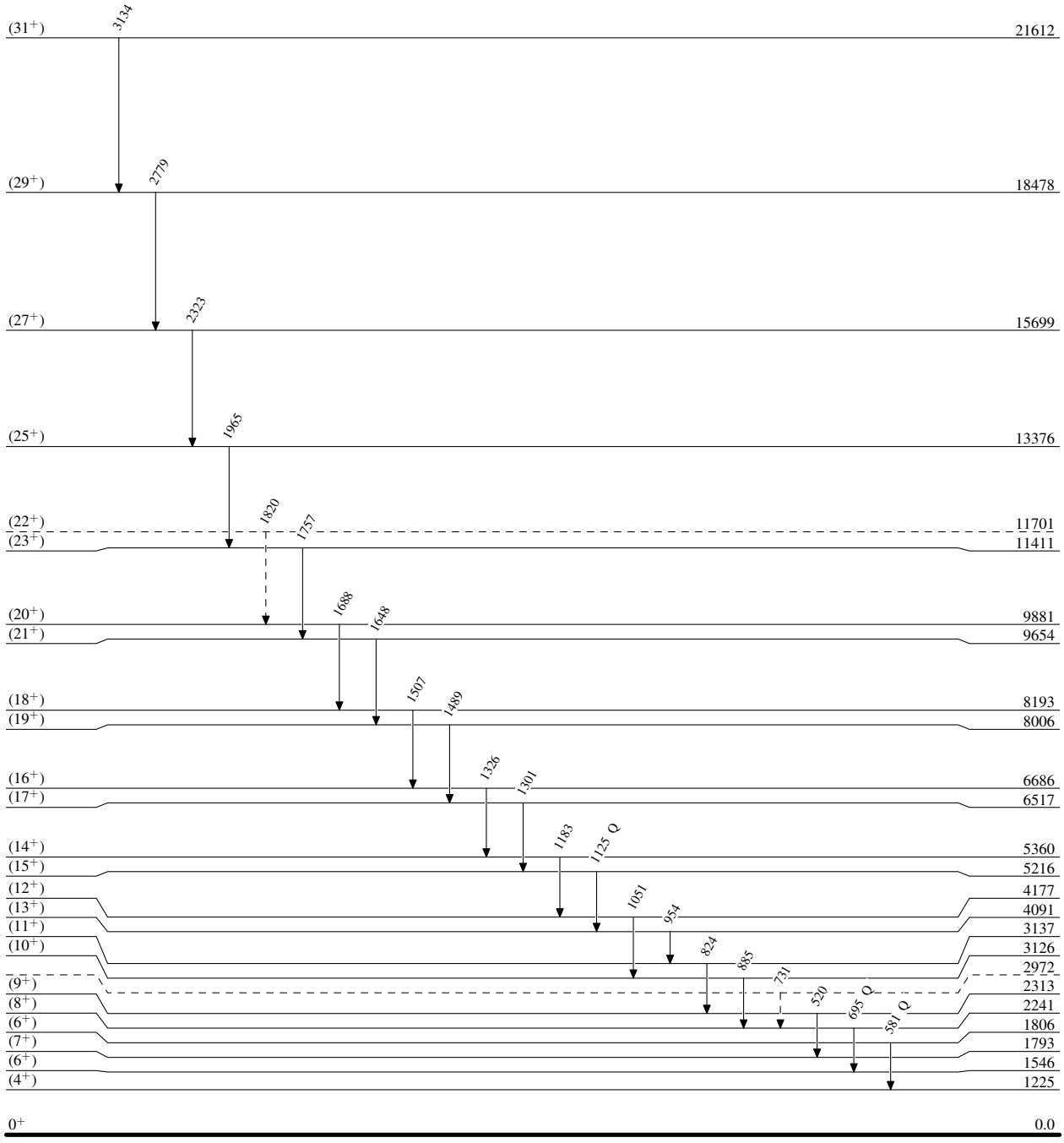
[†] From $\gamma\gamma(\theta)$(DCO). Mult=Q indicates $\Delta J=2$, mult=D indicates $\Delta J=1$ transition.
[‡] Placement of transition in the level scheme is uncertain.

Legend

Adopted Levels, Gammas

Level Scheme

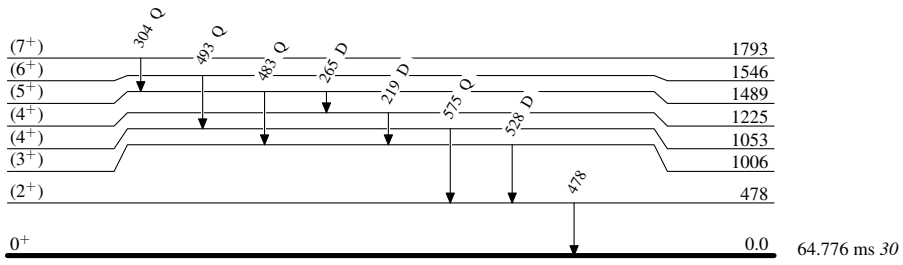
γ Decay (Uncertain)



$^{74}_{37}Rb_{37}$

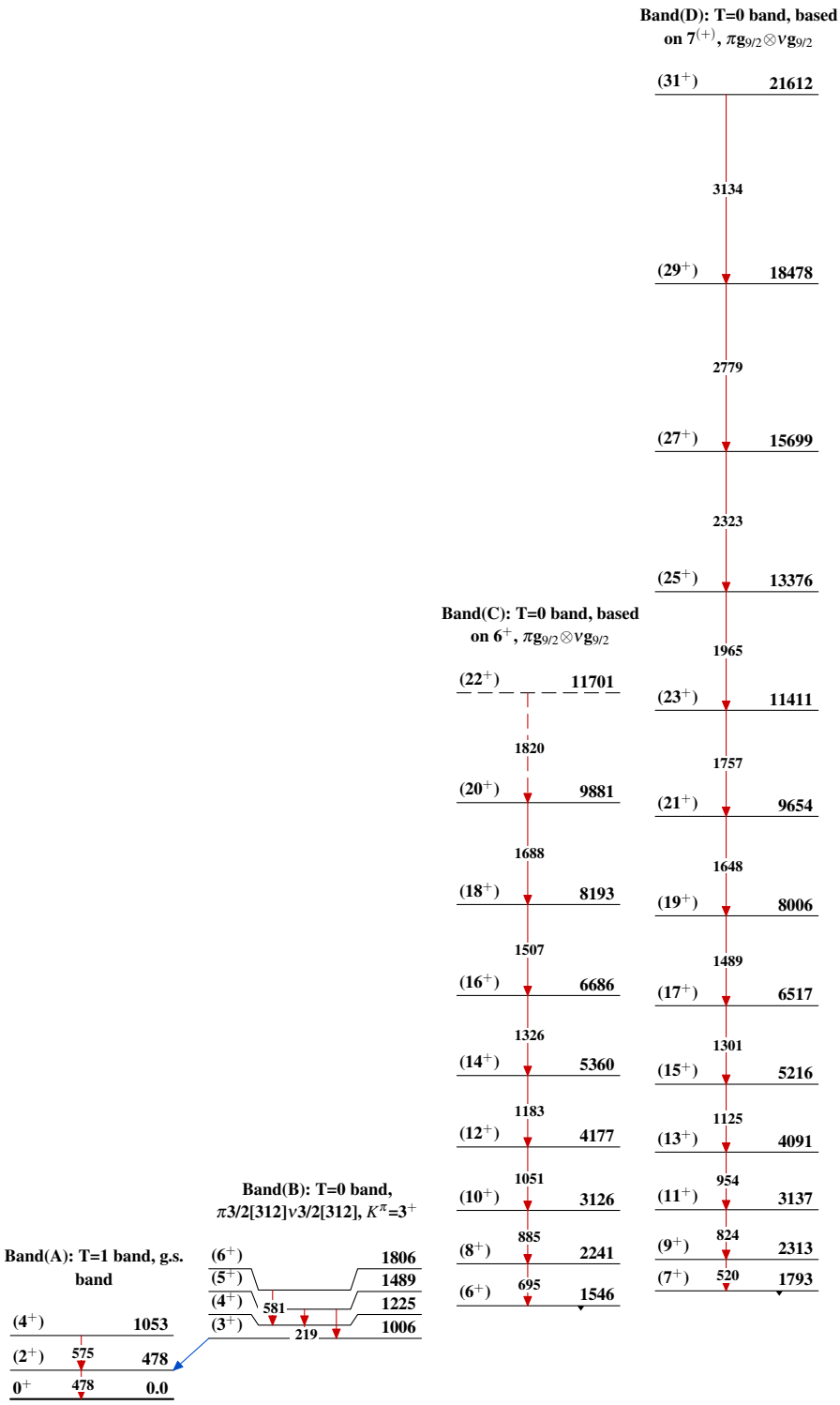
Adopted Levels, Gammas

Level Scheme (continued)



$^{74}_{37}Rb_{37}$

Adopted Levels, Gammas



$^{74}_{37}Rb_{37}$