Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111,1471 (2010)	1-May-2009

Q(β^-)=6.90×10^3 *4*; S(n)=4.31×10^3 *4*; S(p)=1.390×10^4 *4*; Q(α)=−7.62×10^3 *4* 2012Wa38

Note: Current evaluation has used the following Q record 6480 504790 *1010*.350e$^+$414-7960 70 2003Au03,2009AuZZ.

Production and identification: ^{238}U(p,F) E=20 MeV, on-line isotopic separator IGISOL. Measured: γ, Xγ (1988Pe13).

^{252}Cf SF decay. K x-ray coin (1969WiZX).

Thermal-neutron-induced fission of ^{239}Pu and ^{249}Cf. Chemical separation. Relative activity compared with mass distribution (1978Fr16).

α: Additional information 1.

α: Additional information 2.

^{113}Ru Levels

Cross Reference (XREF) Flags

- A ^{252}Cf SF decay
- B ^{113}Ru IT decay
- C ^{113}Tc β^- decay:160 ms
- D ^{248}Cm SF decay

E(level)‡	J$^\pi$†	T$_{1/2}$	XREF	Comments
0.0	(1/2$^+$)	0.80 s *5*	ABC	%β^-=100 T$_{1/2}$: from decay of 263.5γ assigned to ^{113}Ru after mass separation (1998Ku17). This value confirms previous values of the same group: 0.80 s *10* (1988Pe13) and 0.80 s *6* (1992PeZX). Others: 2.69 s *10* (1969WiZX) 3.2 s *3* (1976MaYL), 3.0 s *7* (1978Fr16). These early assignments seem close to the new assignment ^{113}Rh half-life. J$^\pi$: from 2007Ku23.
98.4 *3*	(3/2$^+$)		BC	
164.2 *6*	(5/2$^+$)		C	
295.0 *6*	(5/2$^+$,7/2$^+$)		C	
433.7 *7*			C	
688.2 *7*			C	
963.1 *12*			C	
1618.6 *10*			C	
0+x@	(7/2$^-$)	510 ms *30*	B D	%β^-≈100 T$_{1/2}$: from 1998Ku17. E(level): x 130 *18* (2003Au03) because above the 99 keV level and below. 160 keV. 2007Ku23 propose about 120 keV in agreement with 2003Au03.
113.36+x# *24*	(9/2$^-$)		A D	
130.44+x@ *24*	(11/2$^-$)		A D	E(level): from 2003Zh14. There is no connection between this band head given by 2003Zh14 and the level scheme from 2007Ku23. More work is needed to clarify the level scheme.
392.5+x# *3*	(13/2$^-$)		A D	
546.5+x@ *3*	(15/2$^-$)		A D	
952.4+x# *4*	(17/2$^-$)		A D	
1008.8+x@ *4*	(19/2$^-$)		A D	
1805.6+x@ *5*	(23/2$^-$)		A D	
2610.2+x@ *6*	(27/2$^-$)		A	
3482.2+x@ *7*	(31/2$^-$)		A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{113}Ru Levels (continued)

† J^{π} without comments are based on band assignments.
‡ From least-squares fit to Eγ′s, assuming Δ(Eγ)=0.3 keV.
# Band(A): 7/2[523], α=+1/2.
@ Band(a): 7/2[523], α=−1/2.

$\gamma(^{113}Ru)$

E_i(level)	J_i^{π}	E_γ †	I_γ	E_f	J_f^{π}	Mult.	α	Comments
98.4	(3/2$^+$)	98.5 *3*	100	0.0	(1/2$^+$)	D		Mult.: From α(K)exp in ^{113}Ru IT decay.
164.2	(5/2$^+$)	65.8	8	98.4	(3/2$^+$)			
		164.3	54	0.0	(1/2$^+$)	(E2)	0.219	α(K)=0.183 *3*; α(L)=0.0295 *5*; α(M)=0.00547 *8*; α(N)=0.000842 *12*; α(O)=2.87×10^{-5} *4*; α(N+..)=0.000871 *13*
295.0	(5/2$^+$,7/2$^+$)	131.1	67	164.2	(5/2$^+$)			
		197.1	50	98.4	(3/2$^+$)			
		294.3	100	0.0	(1/2$^+$)			
433.7		335.5	100	98.4	(3/2$^+$)			
		433.4	91	0.0	(1/2$^+$)			
688.2		589.5	100	98.4	(3/2$^+$)			
		688.5		0.0	(1/2$^+$)			
963.1		668.1	100	295.0	(5/2$^+$,7/2$^+$)			
1618.6		1520.1	100	98.4	(3/2$^+$)			
113.36+x	(9/2$^-$)	113.4 *3*	100	0+x	(7/2$^-$)			
130.44+x	(11/2$^-$)	147.1 *3*	100	113.36+x	(9/2$^-$)			
		260.4 *3*	14	0+x	(7/2$^-$)			
392.5+x	(13/2$^-$)	262.1 *3*	100	130.44+x	(11/2$^-$)			
		409.2 *3*	91	113.36+x	(9/2$^-$)			
546.5+x	(15/2$^-$)	154.0 *3*	14	392.5+x	(13/2$^-$)			
		416.1 *3*	100	130.44+x	(11/2$^-$)			
952.4+x	(17/2$^-$)	405.9 *3*	90	546.5+x	(15/2$^-$)			
		559.9 *3*	100	392.5+x	(13/2$^-$)			
1008.8+x	(19/2$^-$)	562.3 *3*	100	546.5+x	(15/2$^-$)			
1805.6+x	(23/2$^-$)	696.8 *3*	100	1008.8+x	(19/2$^-$)			
2610.2+x	(27/2$^-$)	804.5 *3*	100	1805.6+x	(23/2$^-$)			
3482.2+x	(31/2$^-$)	872.0 *3*	100	2610.2+x	(27/2$^-$)			

† From ^{113}Ru IT decay and ^{252}Cf SF decay.

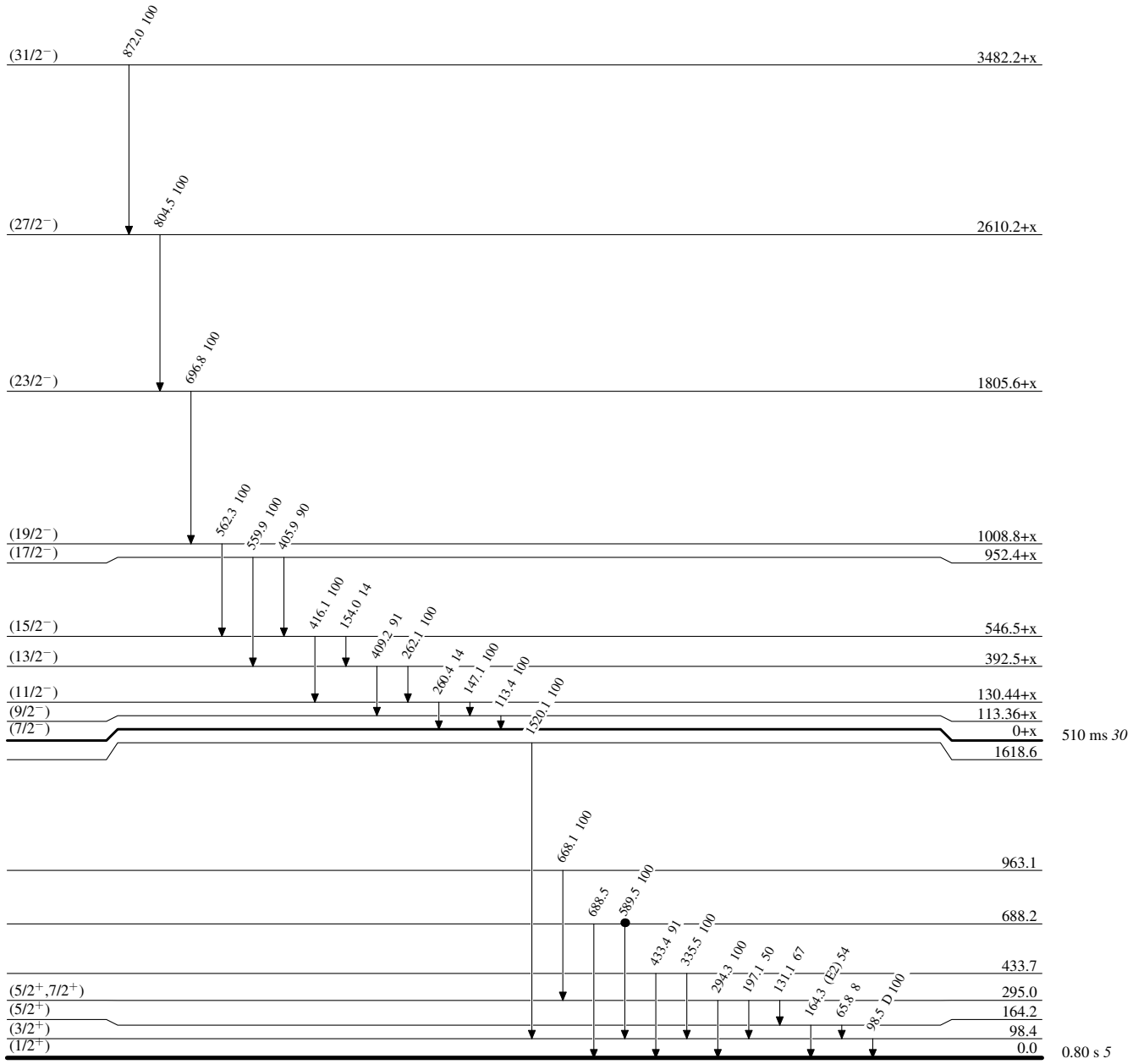
Adopted Levels, Gammas

Legend

Level Scheme

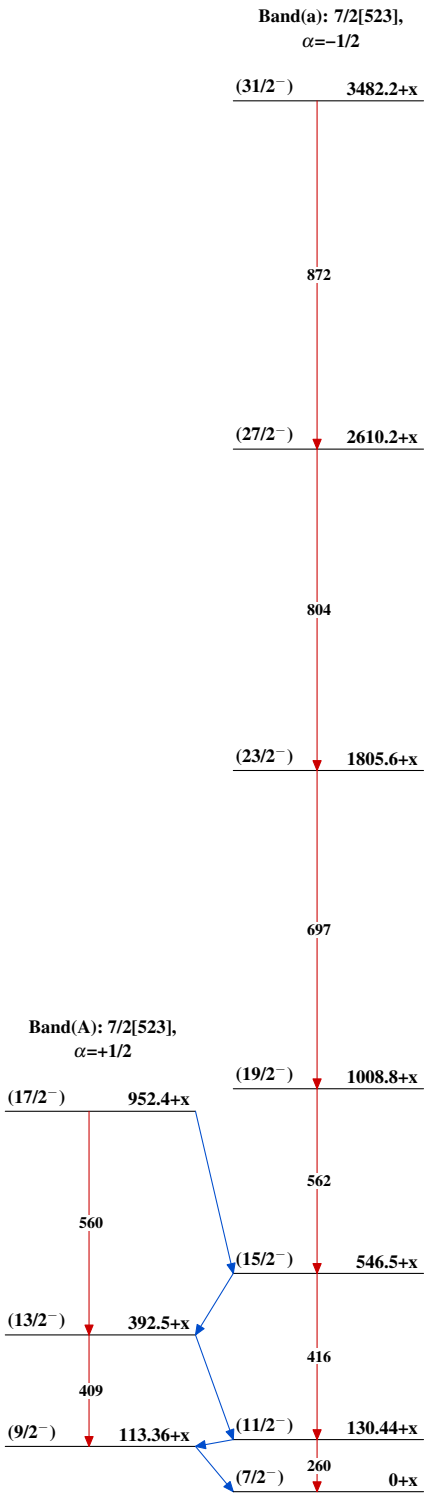
Intensities: Relative photon branching from each level

● Coincidence



$^{113}_{44}Ru_{69}$

Adopted Levels, Gammas



$^{113}_{44}Ru_{69}$