^{94}Ag εp decay 2004Mu30

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

Parent: ^{94}Ag: E≈660; $J^\pi=(7^+)$; $T_{1/2}$=0.61 s *2*; Q(εp)=8580 *SY*; %εp decay=20.0

Parent: ^{94}Ag: E=6.67×10^3 *64*; $J^\pi=(21^+)$; $T_{1/2}$=0.39 s *4*; Q(εp)=8580 *SY*; %εp decay=27.0

^{94}Ag(660)-E: from shell-model calculations (2002La18).

^{94}Ag(660)-$T_{1/2}$: Recommended value from 2004Mu30.

^{94}Ag(660)-%εp decay: 20% is estimated by 2004Mu30; however, a 19% branch is shown In FIG.4 of 2004Mu32.

^{94}Ag(6200)-Branching 27% is estimated by 2004Mu30; however, a 25% branch is shown In FIG.4 of 2004Mu32.

^{94}Ag(6.67E3)-E: From E(p)=790 *30* to E(^{93}Pd)=4994 and E(p)=1010 *30* to E(^{93}Pd)=4751 in ^{94}Ag p decay (2005Mu15) assuming S(p)(^{94}Ag)=890 *640* from systematics (2003Au03). However, see comment on E(^{94}Ag; 21^+ isomer) in ^{94}Ag p decay.

^{94}Ag(6.67E3)-$T_{1/2}$: Recommended value from 2004Mu30.

2004Mu30: ^{94}Ag source from ^{58}Ni(^{40}Ca,p3n) reaction at E=4.8 MeV/nucleon; reaction products stopped in FEBIAD-B3C ion source; GSI on-line mass separator. Measured Eγ, Eβ, E(p), Iγ, Iβ, γγ coin, p-γ-β coin, lifetime in an experiment using a gamma-detector array (17 individual Ge crystals, a Cluster, two Clover and two single Ge detectors) and three Si detectors. In a second experiment, β-feeding distributions, p-β-γ coin and p-x-γ coin were measured with a total absorption spectrometer (TAS) consisting of a large NaI crystal and several auxiliary detectors such as β and x-ray detectors as well as a ΔE-E proton detector. see also 2004Mu32, 2006Mu03, 2007Ro16.

The 23-ms g.s. activity of ^{94}Ag, due to its expected low spin (0^+ from systematics) is not produced in the reaction used for the production of ^{94}Ag isomers.

Relative contribution of the (7^+) and (21^+) isomers is estimated to be 89% and 11%, respectively (2004Mu30).

^{93}Rh Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0#	$(9/2^+)$	1718.91# *15*	$(17/2^+)$	4611.4@ *11*	$(27/2^-,29/2^-)$
240.10 *10*	$(7/2^+)$	2052.31# *18*	$(21/2^+)$	4708.3# *18*	$(33/2^+)$
622.0 *10*	$(5/2^+)$	2197.8? *5*	$(5/2^+)$	4749.0@ *11*	$(29/2^-,31/2^-)$
852.90# *10*	$(13/2^+)$	2595.1# *11*	$(23/2^+)$	5447.0@ *11*	$(29/2 \text{ to } 35/2)^{(-)}$
894.20 *10*	$(11/2^+)$	2890.5# *11*	$(25/2^+)$	5693.9@ *11*	$(31/2 \text{ to } 39/2)^{(-)}$
1451.1 *6*	$(7/2^+)$	3543.0# *11*	$(25/2^+)$	6388.6@ *11*	$(35/2 \text{ to } 41/2)^{(-)}$
1463.9 *7*	$(13/2^+)$	4088.8#& *5*	$(27/2^+)$	6579.7@ *15*	$(35/2 \text{ to } 47/2)^{(-)}$
1630.1 *10*	$(9/2^+)$	4252.1# *11*	$(29/2^+)$	6709.9?@ *15*	$(37/2 \text{ to } 47/2)^{(-)}$
1718.4 *5*	$(11/2^+)$	4549.3# *15*	$(31/2^+)$	6857.9?@ *18*	$(39/2 \text{ to } 47/2)^{(-)}$

† From least-squares fit to Eγ.

‡ From Adopted Levels.

Band(A): π=+ g.s. sequence.

@ Band(B): π=(−) sequence. Based on $(27/2^-,29/2^-)$ 4611 level.

& 2004Mu30 deduce 4088.7 *3*, the average of two experimental level energies: 4088.5 *4* and 4088.9 *4*.

γ(^{93}Rh)

Eγ†	Iγ#	Ei(level)	J_i^π	Ef	J_f^π	Comments
130.2 *3*	0.4 *2*	6709.9?	$(37/2 \text{ to } 47/2)^{(-)}$	6579.7	$(35/2 \text{ to } 47/2)^{(-)}$	
137.6 *1*	1.0 *2*	4749.0	$(29/2^-,31/2^-)$	4611.4	$(27/2^-,29/2^-)$	
148 *1*		6857.9?	$(39/2 \text{ to } 47/2)^{(-)}$	6709.9?	$(37/2 \text{ to } 47/2)^{(-)}$	
159 *1*	0.4 *2*	4708.3	$(33/2^+)$	4549.3	$(31/2^+)$	
191.1 *1*	0.4 *2*	6579.7	$(35/2 \text{ to } 47/2)^{(-)}$	6388.6	$(35/2 \text{ to } 41/2)^{(-)}$	Eγ: Placement and intensity of transition deduced in 2004Mu30 by using coincident-proton threshold of 2.5 MeV.

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^{94}Ag εp decay 2004Mu30 (continued)

γ(^{93}Rh) (continued)

E_γ[†]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[@]	Comments
240.1 *1*	2.0 *2*	240.10	(7/2$^+$)	0.0	(9/2$^+$)	[M1]	0.0319	α(K)=0.0279 *4*; α(L)=0.00332 *5*; α(M)=0.000618 *9*; α(N+..)=0.0001077 *16* α(N)=0.0001025 *15*; α(O)=5.19×10^{-6} *8*
246.9 *1*	0.7 *1*	5693.9	(31/2 to 39/2)$^{(-)}$	5447.0	(29/2 to 35/2)$^{(-)}$			
295.4 *2*	1.0 *2*	2890.5	(25/2$^+$)	2595.1	(23/2$^+$)			
297.2		4549.3	(31/2$^+$)	4252.1	(29/2$^+$)			E_γ: from Adopted Gammas.
333.4 *1*	1.75 *16*	2052.31	(21/2$^+$)	1718.91	(17/2$^+$)	[E2]	0.0199	α(K)=0.01711 *24*; α(L)=0.00229 *4*; α(M)=0.000427 *6*; α(N+..)=7.22×10^{-5} *11* α(N)=6.93×10^{-5} *10*; α(O)=2.91×10^{-6} *4*
x368[‡]								
x440[‡]								
496.9 *3*	0.37 *10*	4749.0	(29/2$^-$,31/2$^-$)	4252.1	(29/2$^+$)			
522.4 *1*	0.92 *13*	4611.4	(27/2$^-$,29/2$^-$)	4088.8	(27/2$^+$)			
542.8	<2.6	2595.1	(23/2$^+$)	2052.31	(21/2$^+$)			E_γ: from Adopted Gammas; Eγ=543.7 *2* (Iγ=2.4 *2*) in 2004Mu30 is for a doublet comprised of the adopted 542.8γ and 545.5γ. I_γ: 2.4 *2* for doublet.
545.5	<2.6	4088.8	(27/2$^+$)	3543.0	(25/2$^+$)			E_γ: from Adopted Gammas; see comment on 542.8γ. I_γ: 2.4 *2* for doublet.
557 *1*		1451.1	(7/2$^+$)	894.20	(11/2$^+$)			
570 *1*		1463.9	(13/2$^+$)	894.20	(11/2$^+$)			
622 *1*	0.5 *3*	622.0	(5/2$^+$)	0.0	(9/2$^+$)			
652.5 *2*	0.56 *13*	3543.0	(25/2$^+$)	2890.5	(25/2$^+$)			
654 *1*		894.20	(11/2$^+$)	240.10	(7/2$^+$)			
694.7		6388.6	(35/2 to 41/2)$^{(-)}$	5693.9	(31/2 to 39/2)$^{(-)}$			E_γ: from Adopted Gammas.
698.0 *1*	1.64 *19*	5447.0	(29/2 to 35/2)$^{(-)}$	4749.0	(29/2$^-$,31/2$^-$)			
x705[‡]								
852.9 *1*	11.3 *5*	852.90	(13/2$^+$)	0.0	(9/2$^+$)			
866.0 *1*	3.24 *16*	1718.91	(17/2$^+$)	852.90	(13/2$^+$)			
894.2 *1*	4.3 *2*	894.20	(11/2$^+$)	0.0	(9/2$^+$)			
948 *1*		3543.0	(25/2$^+$)	2595.1	(23/2$^+$)			
1361.7 *3*	0.36 *12*	4252.1	(29/2$^+$)	2890.5	(25/2$^+$)			
1390 *1*		1630.1	(9/2$^+$)	240.10	(7/2$^+$)			
1451.0 *7*	0.41 *13*	1451.1	(7/2$^+$)	0.0	(9/2$^+$)			
1463.7 *8*	0.43 *17*	1463.9	(13/2$^+$)	0.0	(9/2$^+$)			
1493.8 *3*	0.7 *3*	4088.8	(27/2$^+$)	2595.1	(23/2$^+$)			E_γ: Placement and intensity of transition deduced in 2004Mu30 by using coincident-proton threshold of 2.5 MeV.
x1565.4 *4*	0.50 *17*							
1718.4 *5*	0.7 *2*	1718.4	(11/2$^+$)	0.0	(9/2$^+$)			
x1861.0 *3*	0.53 *16*							
2197.8 *5*	0.88 *16*	2197.8?	(5/2$^+$)	0.0	(9/2$^+$)			

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^{94}Ag εp decay 2004Mu30 (continued)

γ(^{93}Rh) (continued)

† From 2004Mu30; uncertainties range from 0.1 to 1.1 keV.
‡ Weak uncertain line. coincident with protons and $\gamma^{\pm}$ only.
# For absolute intensity per 100 decays, multiply by 0.20.
@ 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.
x γ ray not placed in level scheme.

Delayed Protons (^{93}Rh)

E(^{93}Rh)	I(p)†‡	Comments
0.0	3.3 *7*	I(p): Deduced from TAS measurements.
240.10	1.7	
622.0	0.4	
852.90	6.8	
894.20	3.0	
1451.1	0.3	
1463.9	0.3	
1718.4	0.5	
1718.91	1.3	
2052.31	0.0	
2197.8?	0.7	
2595.1	0.3	I(p): Derived by 2004Mu30 assuming I(333γ)>I(543γ)>[I(295γ)+I(1494γ)].
2890.5	0.2	
3543.0	0.1	
4088.8	0.1	I(p): Derived by 2004Mu30 assuming I(546γ)=I(543γ+546γ)−I(543γ).
4252.1	0.0	
4708.3	0.3	
4749.0	0.1	
5447.0	0.8	
5693.9	0.6	
6579.7	0.4	
6709.9?	0.4	

† Per 100 decays of the combined activity from two isomers.
‡ For absolute intensity per 100 decays, multiply by 0.20.

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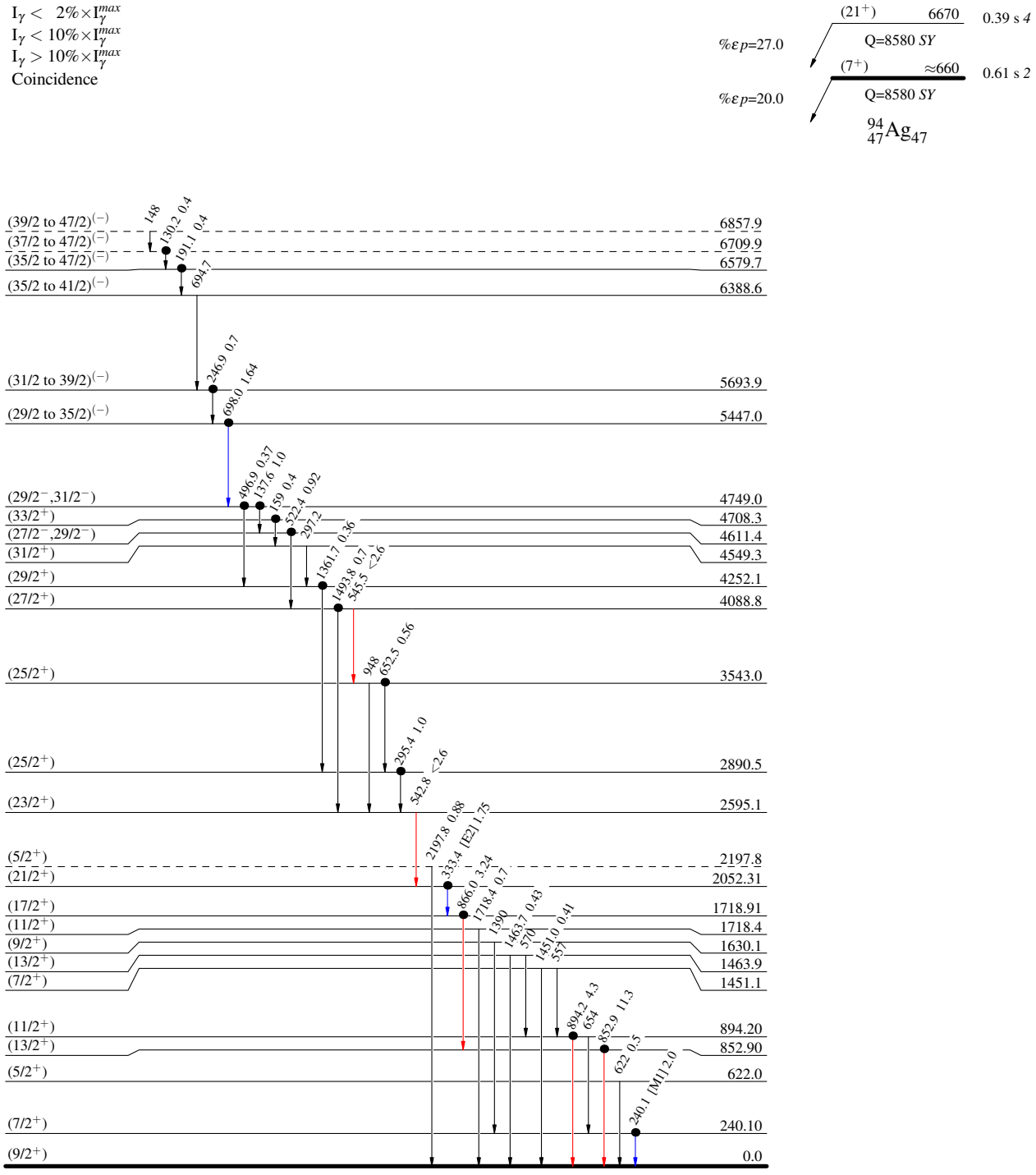
Decay Scheme

Intensities: Relative I_γ

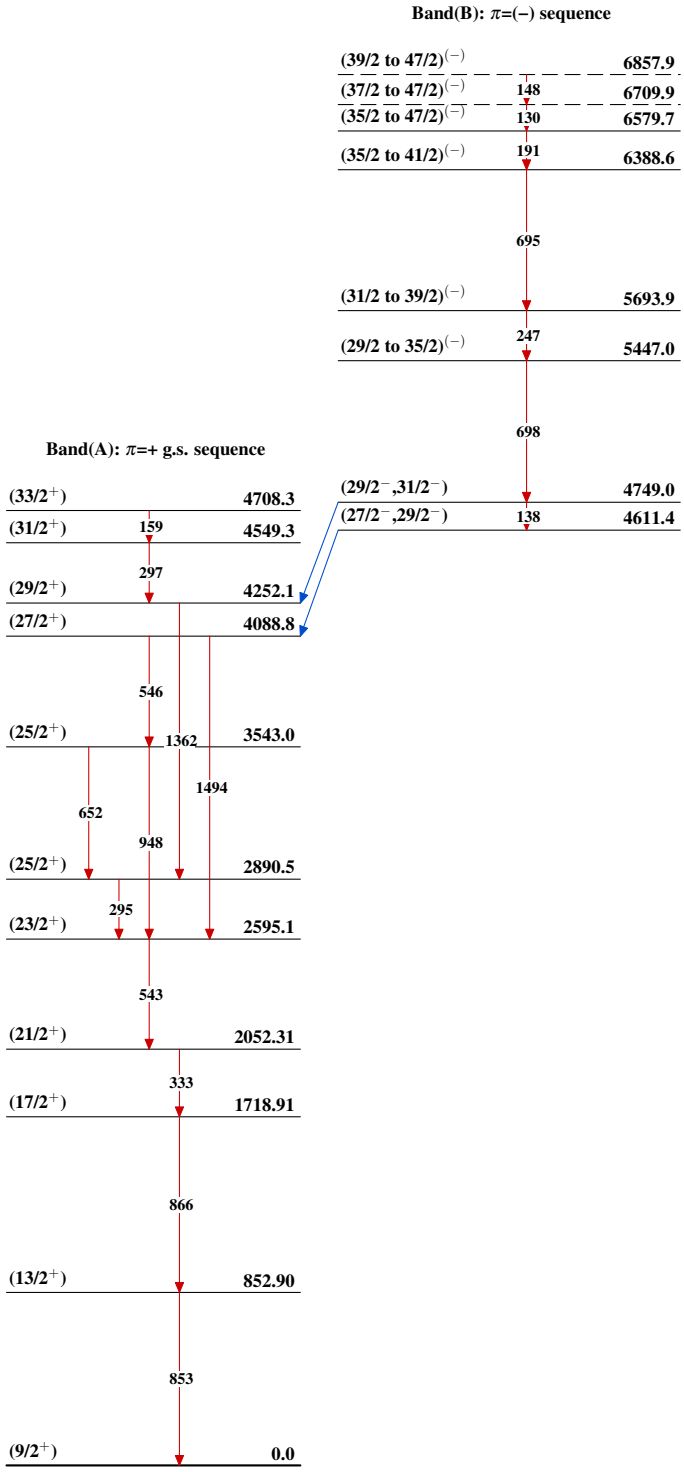
Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence



$^{93}_{45}Rh_{48}$

^{94}Ag εp decay 2004Mu30



$^{93}_{45}Rh_{48}$