⁹⁴Ag p decay (0.39 s) 2005Mu15,2005Mu30,2009Ce04

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

Parent: ⁹⁴Ag: E=6.2×10³ 20; J^{π} =(21⁺); T_{1/2}=0.39 s 4; Q(p)=-370 syst; %p decay=4.1 6

⁹⁴Ag-E: Poorly established. E=6240 2000 from E(p)=790 20 to 4993 level, E(p)=1010 30 to 4751 and S(p)(⁹⁴Ag)=370 2000 (2009AuZZ; from systematics). 2008Ka30 measured mass excesses for ⁹²Rh and ⁹⁴Pd and deduced Q(ε) for ⁹⁴Ag(g.s.) ε decay from an extrapolation of Coulomb displacement energies for nearby N=Z nuclides; combining the implied ⁹⁴Ag S(2p)=4910 360 with observed (2006Mu03) E(2p)=1900 100 to ⁹²Rh(1549 level), they deduce E(⁹⁴Ag isomer)=8360 370. See 2007Pe14, 2008Ka30, 2008Ka19 for further discussion of this issue. Note that S(2p)(⁹⁴Ag)=4100 2040 from systematics in 2009AuZZ.
⁹⁴Ag-T_{1/2}: From 2005Mu30. Other: 0.45 s 20 (2001Ki13).

⁹⁴Ag-%p decay: From %(790p)=1.9 5 and %(1010p)=2.2 4 (2005Mu15, 2006Mu03).

All information taken from 2005Mu15, unless stated otherwise.

2005Mu15, 2005Mu30: ⁹⁴Ag source produced in ⁵⁸Ni(⁴⁰Ca,p3n) reaction and subsequently ionized by the FEBIAD-E or

FEBIAD-B2C ion source; reaction products mass-separated; detector array of three large-area Si multistrip detectors and 17 Ge crystals (total photopeak efficiency 3.2% at 1.33 MeV); measured E γ , I γ , $\gamma\gamma$ coin, p- γ coin.

2009Ce04: ⁹⁴Ag source produced from bombardment of natural Ni target by a 197-MeV ⁴⁰Ca beam; reaction products recoil in He plus ethylene glycol, are deposited within 0.20 s 5 on slowly rotating catcher wheel to remove long-lived β emitters, and collection spot viewed in low background area by an array of 24 de1(gas)-de2(gas)-E(Si) detector telescopes which can identify protons with E>400 keV; measured E(p), p-p coin.

2005Mu15 and 2005Mu30 assume that both of the observed proton branches originate from the same (21⁺) isomer in ⁹⁴Ag.

⁹³Pd Levels

E(level) [†]	$J^{\pi \ddagger}$	E(level) [†]	$J^{\pi \ddagger}$	E(level) [†]	$J^{\pi \ddagger}$
0.0	$(9/2^+)$	2428.6 [@] 15	(19/2+)	3861.4 [@] 23	(29/2+)
984.0 [@] 10	$(13/2^+)$	2595.6 [@] 18	$(21/2^+)$	4137.2? ^{&} 24	$(29/2^{-},31/2^{-})^{\#}$
1871.4 [@] 13	$(15/2^+)$	2870.6 [@] 21	$(25/2^+)$	4751? ^{&} 3	$(33/2^-, 35/2^-)^{\#}$
2079.6 [@] 13	$(17/2^+)$	3384.8 ^{&} 23	$(25/2^{-},27/2^{-})^{\#}$	4993.4 [@] 25	$(33/2^+)$
2232.5 [@] 14	$(17/2^+)$	3734.0? ^{&} 24	(29/2 ⁻ ,31/2 ⁻) [#]		

[†] From least-squares fit to $E\gamma$, assigning 1 keV uncertainty to all data.

[‡] From Adopted Levels; same as values proposed by 2005Mu15.

[#] Tentative π =- level sequence built on (25/2⁻,27/2⁻) 3385 level; proposed because observation of proton branches in ⁹⁴Ag p decay with similar strength to 4994 and 4751 levels make it unlikely that the latter level also belongs in the π =(+) yrast sequence (2005Mu15).

[@] Band(A): π =(+) sequence based on g.s..

& Band(B): $\pi = (-)$ sequence. Based on $(25/2^-, 27/2^-)$ 3385 level. Analogous to $\pi = -$ yrast sequences in N=47 isotones ⁸⁹Mo and ⁹¹Ru.

E_{γ}^{\dagger}	E _i (level)	J_i^π	$\mathbf{E}_f \mathbf{J}_f^{\pi}$	Mult. [‡]	α #	Comments
153	2232.5	$(17/2^+)$	2079.6 (17/2 ⁺)			
167	2595.6	$(21/2^+)$	2428.6 (19/2+)	D		
196	2428.6	(19/2+)	2232.5 (17/2+)	(D)		I _{γ} : I(196 γ)/I(349 γ)=1.0 <i>3</i> (from p- γ spectra gated on 790-keV protons) and 0.52 <i>17</i> (from p- γ spectra gated on 1010-keV protons).
208	2079.6	$(17/2^+)$	1871.4 (15/2 ⁺)			
275	2870.6	$(25/2^+)$	2595.6 (21/2+)			
276 [@]	4137.2?	(29/2 ⁻ ,31/2 ⁻)	3861.4 (29/2 ⁺)	[E1]	0.00868 13	$\alpha(K)=0.00759 \ 11; \ \alpha(L)=0.000889 \ 13;$

Continued on next page (footnotes at end of table)

 (^{93}Pd)

⁹⁴Ag p decay (0.39 s) 2005Mu15,2005Mu30,2009Ce04 (continued)

γ (⁹³Pd) (continued)

E_{γ}^{\dagger}	E _i (level)	\mathbf{J}_i^{π}	E_f	${ m J}_f^\pi$	Mult. [‡]	Comments
						$\alpha(M)=0.0001662\ 24;\ \alpha(N+)=2.78\times10^{-5}$
						$\alpha(N)=2.78\times10^{-5} 4$
						Mult.: possibly E1 since γ connects level sequences with $\pi = (-)$ and $\pi = (+)$.
349	2428.6	$(19/2^+)$	2079.6	$(17/2^+)$		
349	3734.0?	$(29/2^{-},31/2^{-})$	3384.8	$(25/2^{-}, 27/2^{-})$		
361	2232.5	$(17/2^+)$	1871.4	$(15/2^+)$	(D)	
403	4137.2?	$(29/2^{-},31/2^{-})$	3734.0?	$(29/2^{-}, 31/2^{-})$		
514 [@]	3384.8	(25/2 ⁻ ,27/2 ⁻)	2870.6	(25/2+)	[E1]	Mult.: possibly E1 since γ connects level sequences with
		(22) (2 25) (2)				$\pi = (-)$ and $\pi = (+)$. Levels.
614	4751?	$(33/2^-, 35/2^-)$	4137.2?	$(29/2^-, 31/2^-)$		Coincident with 153γ , 167γ , 275γ , 349γ , 403γ .
887	1871.4	$(15/2^+)$	984.0	$(13/2^+)$	(D)	
984	984.0	$(13/2^+)$	0.0	$(9/2^+)$	Q	
991	3861.4	$(29/2^+)$	2870.6	$(25/2^+)$	Q	
1096	2079.6	$(17/2^+)$	984.0	$(13/2^+)$	Q	
1132	4993.4	$(33/2^+)$	3861.4	$(29/2^+)$	Q	Coincident with 153γ , 167γ , 208γ .

[†] From table I of 2005Mu15, unless stated otherwise. [‡] From Adopted Gammas.

[#] 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.

Protons (93Pd)

E(p)	E(⁹³ Pd)	I(p)	L	Comments
790 20	4993.4	46 12	[4]	 E(p): from 2009Ce04; E=790 30 reported by 2005Mu15. E(p): 2005Mu15's placement of p branch to this level is based on observed 790p-γ coin with known 1132γ deexciting the 4993 level; 790-keV protons are also observed in coincidence with all γ rays in the cascade to the g.s. following the 1132γ.
1010 [†] <i>30</i>	4751?	54 10	[3,5]	E(p): from 2005Mu15; 2009Ce04 fail to observe this proton group, possibly due to the lack of mass separation and/or the β-delayed proton background in their singles measurement. E(p): 2005Mu15's placement of proton branch to this level is based on p- γ coin with 349 γ from known 3734 level and with newly-observed 403 γ , 276 γ and 614 γ , placed in a manner consistent with previously known levels at 3862 and 2871. The 1010-keV protons were observed in coincidence with all listed transitions, except the 1132 γ .

 † Placement of transition in the level scheme is uncertain.



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