

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174, 1 (2021)	15-Apr-2021

$Q(\beta^-)=7850\ 30$; $S(n)=6530\ 50$; $S(p)=12240\ 40$; $Q(\alpha)=-9170\ 30$ [2021Wa16](#)

$S(2n)=11310\ 30$, $S(2p)=27900\ 620$, $Q(\beta^-n)=2970\ 30$ ([2021Wa16](#)).

Other measurements:

[1976Lu02](#): ^{123}Ag produced and identified in $^{235}\text{U}(n,f)$ E=th reaction followed by on-line mass separation. Measured β -delayed neutrons, half-life of ^{123}Ag decay.

Precise mass measurements: [2010Br02](#), [2008Su19](#) (also [2010Li02](#)).

Additional information 1.

Structure calculations: [2017Ko24](#), [2015Sa14](#), [2012Ji07](#), [2007Na28](#), [2003Bo06](#), [2003Bo48](#), [1997Bo24](#), [1996Bo11](#).

The level scheme is based on that of [2019Ch14](#) in ^{123}Pd β^- decay and [2013La11](#) in ^{123}Ag IT decay (393 ns).

 ^{123}Ag LevelsCross Reference (XREF) Flags

- A** ^{123}Pd β^- decay
B ^{123}Ag IT decay (393 ns)
C ^{123}Ag IT decay (202 ns)

E(level) [†]	J^π [‡]	$T_{1/2}$	XREF	Comments
0.0	(7/2 ⁺)	0.299 s 7	AB	$\% \beta^- = 100$; $\% \beta^- n = 0.62\ 9$ J^π : from systematics of lower mass odd-Ag isotopes $J^\pi = 1/2^-$ or $7/2^+$, but $1/2^-$ is disfavored by the observed β feeding of three levels which feed an $11/2^{(-)}$ isomer. $T_{1/2}$: weighted average of 0.272 s 24 (2006Mo07 , implant- β correlations); 0.293 s 7 (1995Fe12 , β and neutron counting using a laser-ionized source at ISOLDE-CERN facility); 0.35 s 4 (1989Hu10 , γ -counting); 0.30 s 2 (1986Ma42 , γ counting); 0.30 s 1 (1983Re05 ; neutron counting); 0.350 s 20 from neutron and γ -decay curves (2021Te02). Others: 0.396 s 15 (2014TeZY) from neutron and γ -decay curves; 0.39 s 3 (1976Lu02 , neutron counting). $\% \beta^- n$: weighted average of 0.55 9 (1983Re05 , uncertainty of 3.6% statistical and 15% systematic given in 1983Re05 combined in quadrature by the evaluator), 0.60 25 (2014TeZY , neutron- β measurement), 1.0 5 (2006Mo07 , from implant- β decay curve analysis), and 1.01 24 (2021Te02 , neutron counting).
26.96 24	(9/2 ⁺)		AB	
59.8 8	(1/2 ⁻)		A C	E(level): the position of the $1/2^-$ isomer is identified by 2019Ch24 in ^{123}Pd β^- decay based on $\gamma\gamma$ -coin; 0+x in 2013La11 . J^π : from shell-model predictions (2019Ch24).
385.0 7	(3/2 ⁻ , 5/2 ⁻)		A	
442.9 7	(3/2 ⁻ , 5/2 ⁻)		A C	
656.8 4	(11/2 ⁺)	<25 ns	AB	J^π : (13/2 ⁺) suggested by 2009St28 . $T_{1/2}$: from $\gamma(t)$ (2013La11). $T_{1/2}$: from $\gamma(t)$ (2013La11).
740.9 3	(13/2 ⁺)	<25 ns	AB	
968.9 7			A	
1036.2 4			A C	
1076.54 24	(9/2 ⁻ , 11/2 ⁺)		AB	J^π : (11/2 ⁺) suggested by 2009St28 .
1426.2 3	(13/2 ⁻)		AB	J^π : (15/2 ⁺ , 13/2 ⁻) suggested by 2009St28 .
1426.4 8			A C	
1426.4+y		202 ns 20	C	$\% \text{IT} = 100$

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Adopted Levels, Gammas (continued) ^{123}Ag Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>T_{1/2}</u>	<u>XREF</u>	<u>Comments</u>
				E(level): this isomer feeds the 1426.4 level directly or indirectly (2013La11), but the feeding transition has not been observed.
1473.9 4	(17/2 ⁻)	393 ns 16	B	T _{1/2} : from $\gamma(t)$ (2013La11). %IT=100 T _{1/2} : from $\gamma(t)$, weighted average of 393 ns 16 (2013La11) and 396 ns 37 (2009St28).
1647.2 5			A	
1806.7 5			A	
1852.4 5			A	
2217.0 6			A	

[†] From a least-squares fit to γ -ray energies, assuming $\Delta E_{\gamma}=0.3$ keV where not given.

[‡] For excited states, tentative assignment are from [2013La11](#) based on systematics and observed decay pattern and also from [2019Ch24](#) based on shell-model predictions.

 $\gamma(^{123}\text{Ag})$

<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_γ[†]</u>	<u>I_γ[†]</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>Comments</u>
26.96	(9/2 ⁺)	(27)		0.0	(7/2 ⁺)		E _γ : not observed experimentally in 2013La11 and 2019Ch24 .
385.0	(3/2 ⁻ , 5/2 ⁻)	325.1		59.8	(1/2 ⁻)		
442.9	(3/2 ⁻ , 5/2 ⁻)	57.9		385.0	(3/2 ⁻ , 5/2 ⁻)		
		383.1 7	100	59.8	(1/2 ⁻)		E _γ : other: 383.1 from ^{123}Pd β^{-} decay (2019Ch24).
656.8	(11/2 ⁺)	629.6 5	100	26.96	(9/2 ⁺)		E _γ : other: 629.7 from ^{123}Pd β^{-} decay (2019Ch24).
740.9	(13/2 ⁺)	84.1	10 5	656.8	(11/2 ⁺)		E _γ : γ not seen in 2013La11 .
		714.0 2	100	26.96	(9/2 ⁺)		E _γ : other: 713.6 from ^{123}Pd β^{-} decay (2019Ch24).
968.9		526.0		442.9	(3/2 ⁻ , 5/2 ⁻)		
1036.2		593.3 5	100	442.9	(3/2 ⁻ , 5/2 ⁻)		E _γ : other: 594.0 from ^{123}Pd β^{-} decay (2019Ch24).
		1009.2		26.96	(9/2 ⁺)		
1076.54	(9/2 ⁻ , 11/2 ⁺)	335.2 5	19 4	740.9	(13/2 ⁺)		
		1049.3 5	51 8	26.96	(9/2 ⁺)		E _γ : other: 1049.6 from ^{123}Pd β^{-} decay (2019Ch24).
		1076.5 3	100 7	0.0	(7/2 ⁺)		E _γ : other: 1077.0 from ^{123}Pd β^{-} decay (2019Ch24).
1426.2	(13/2 ⁻)	349.5 2	46.3 25	1076.54	(9/2 ⁻ , 11/2 ⁺)		E _γ : other: 349.1 from ^{123}Pd β^{-} decay (2019Ch24).
		685.6 2	100.0 28	740.9	(13/2 ⁺)		E _γ : other: 685.3 from ^{123}Pd β^{-} decay (2019Ch24).
		769.3 5	34.2 18	656.8	(11/2 ⁺)		E _γ : other: 770.0 from ^{123}Pd β^{-} decay (2019Ch24).
1426.4		390.2 7	100	1036.2			E _γ : other: 390.1 from ^{123}Pd β^{-} decay (2019Ch24).
1426.4+y		x [#]					E _γ : de-exciting transition directly from this isomer is not observed (2013La11). Such transition could feed directly the 1426.1 level or possible unobserved intermediate levels that feed the 1426.1 level.

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Adopted Levels, Gammas (continued) $\gamma(^{123}\text{Ag})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.	$\alpha^\ddagger$	Comments
1473.9	(17/2 ⁻)	(48)	75 2	1426.2	(13/2 ⁻)	[E2]	19.9	B(E2)(W.u.)=7.1 8
		732.7 3	100 30	740.9	(13/2 ⁺)	[M2]	0.0068	B(M2)(W.u.)=9.0×10 ⁻⁴ 26
1647.2		611.0		1036.2				
1806.7		770.5		1036.2				
1852.4		816.2		1036.2				
2217.0		569.8		1647.2				

[†] Values with uncertainties from [2013La11](#) in IT decays and those without uncertainties from [2019Ch24](#) in ^{123}Pd β^- decay. E_γ values are also available in [2009St28](#) but systematically higher by ≈ 2 -4 keV than those in [2013La11](#) and [2019Ch24](#).

[‡] 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.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)