^{203}Pt β^- decay 2013Mo20

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 177, 509, 2021	4-Jul-2021

Parent: ^{203}Pt: E=0; J$^\pi$=(1/2$^-$); T$_{1/2}$=22 s *4*; Q(β^-)=3630 *SY*; %β^- decay=100.0

^{203}Pt-J$^\pi$,T$_{1/2}$: From Adopted Levels for ^{203}Pt.

^{203}Pt-Q(β^-): 3630 *200* (syst, 2021Wa16).

^{203}Pt produced in cold fragmentation reactions with E=1 GeV/nucleon ^{208}Pb beam impinging a 2.5 g/cm^2 thick Be target. The beam was provided by SIS-18 synchrotron at GSI facility. Residues of interest were separated using Fragment Separator. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\beta\gamma$-coin, fragment-γ correlated event using RISING array of 15 cluster Ge detectors and nine DSSSD detectors. Other: 2011MoZP.

^{203}Au Levels

E(level)†	J$^\pi$‡
0.0	3/2$^+$
39.0 *9*	1/2$^+$
385.0 *20*	3/2$^+$
563.0 *20*	(7/2$^+$)
874? *5*	(3/2$^+$)
976.8 *16*	(1/2$^+$)
982.6 *15*	(1/2$^+$)
1161? *4*	(1/2$^+$,3/2$^+$)
1274.0 *25*	1/2$^+$
1505.8 *13*	(1/2$^+$,3/2$^+$)

† From a least-squares fit to Eγ.
‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Comments
(2124 *SY*)	1505.8	≈8.6	
(2356 *SY*)	1274.0	≈3.7	
(2469# *SY*)	1161?	≈2.3	
(2647 *SY*)	982.6	≈55	
(2653 *SY*)	976.8	≈3.4	
(2756# *SY*)	874?	<2.0	
(3067 *SY*)	563.0	≈2.4	Iβ^-: Cannot be fed directly from the J^π=1/2$^-$, ^{203}Pt parent. The excess β^- feeding is most likely due to the incompleteness of the decay scheme.
(3245 *SY*)	385.0	≈5.1	
(3591 *SY*)	39.0	≈8	
(3630 *SY*)	0.0	≈9	Iβ^-: Based on log *ft*=6.51 for the same 1/2$^-$ [$\nu(p_{1/2}^{-1})$] to 3/2$^+$ [$\pi(d_{3/2}^{-1})$] β^- decay transition in ^{205}Hg.

† From intensity balance considerations.
‡ Absolute intensity per 100 decays.
\# Existence of this branch is questionable.

^{203}Pt β^- decay 2013Mo20 (continued)

$\gamma(^{203}Au)$

Iγ normalization: From the decay scheme; NR=(100−%I$_{\beta_0}$)/Σ I$_{\gamma+ce}$(to g.s.), with %I$_{\beta_0}$ ≈ 9. Since the decay scheme is incomplete, the value should be considered as approximate.

E_γ [†]	I_γ [†‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α [#]	Comments
39.0 *9*	5.4 *8*	39.0	1/2$^+$	0.0	3/2$^+$	[M1]	20.5 *3*	α(L)=15.7 *12*; α(M)=3.7 *3* α(N)=0.91 *7*; α(O)=0.167 *13*; α(P)=0.0113 *9* I$_\gamma$: From I(γ+ce)=117 *17* and α(tot)=20.5 *3* in 2013Mo20. α: From 2013Mo20.
311 [@] *5*	<6.6	874?	(3/2$^+$)	563.0	(7/2$^+$)	[E2]	0.092 *5*	α(K)=0.248 *12*; α(L)=0.0409 *20*; α(M)=0.0095 *5* α(N)=0.00236 *12*; α(O)=0.000434 *21*; α(P)=2.94×10^{-5} *14*
^{x}353 *2*	13.1 *11*							E$_\gamma$: Shows a 12 s time component, indicating that most likely this γ ray follows the decay of the J^π=13/2$^+$ isomer in ^{203}Pt. However, there is no direct evidence that this γ-ray is associated with the β$^-$ branch of the isomer, since such a decay would proceed via the J^π=11/2$^-$ isomer at 641 keV in ^{203}Au, which was not observed in 2013Mo20. The existence of a high-spin (J=11/2,13/2,15/2) state at 353 keV in ^{203}Au seems unphysical and most-likely the 353γ follows the IT decay of the J^π=13/2$^+$ isomer in ^{203}Pt or β$^-$ decay of the ^{203}Ir ground state.
385 *2*	17.4 *14*	385.0	3/2$^+$	0.0	3/2$^+$	[M1,E2]	0.169 *4*	α(K)=0.139 *3*; α(L)=0.0229 *5*; α(M)=0.00529 *11* α(N)=0.00132 *3*; α(O)=0.000243 *5*; α(P)=1.65×10^{-5} *4*
563 *2*	8.5 *9*	563.0	(7/2$^+$)	0.0	3/2$^+$	[E2]	0.0195 *4*	α(K)=0.01460 *24*; α(L)=0.00371 *7*; α(M)=0.000899 *16* α(N)=0.000223 *4*; α(O)=3.88×10^{-5} *7*; α(P)=1.62×10^{-6} *3*
776 [@] *4*	4.1 *6*	1161?	(1/2$^+$,3/2$^+$)	385.0	3/2$^+$	[M1,E2]	0.0270 *6*	α(K)=0.0223 *5*; α(L)=0.00358 *7*; α(M)=0.000827 *16* α(N)=0.000206 *4*; α(O)=3.80×10^{-5} *8*; α(P)=2.60×10^{-6} *5*
889.0 *15*	6.7 *9*	1274.0	1/2$^+$	385.0	3/2$^+$	[M1,E2]	0.0191	α(K)=0.01579 *24*; α(L)=0.00252 *4*; α(M)=0.000582 *9* α(N)=0.0001449 *22*; α(O)=2.67×10^{-5} *4*; α(P)=1.83×10^{-6} *3*
943.6 *12*	100 *7*	982.6	(1/2$^+$)	39.0	1/2$^+$	[M1]	0.01638	α(K)=0.01357 *20*; α(L)=0.00216 *4*; α(M)=0.000499 *8* α(N)=0.0001243 *18*; α(O)=2.29×10^{-5} *4*; α(P)=1.573×10^{-6} *23*
976.8 *16*	6.1 *8*	976.8	(1/2$^+$)	0.0	3/2$^+$	[M1,E2]	0.01500 *22*	α(K)=0.01243 *19*; α(L)=0.00198 *3*; α(M)=0.000457 *7*

Continued on next page (footnotes at end of table)

^{203}Pt β^- decay 2013Mo20 (continued)

$\gamma(^{203}$Au) (continued)

E_γ †	I_γ †‡	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α #	Comments
								α(N)=0.0001137 *17*; α(O)=2.10×10^{-5} *3*; α(P)=1.440×10^{-6} *21*
1505.8 *13*	15.7 *17*	1505.8	(1/2$^+$,3/2$^+$)	0.0	3/2$^+$	[M1,E2]	0.00514	α(K)=0.00418 *6*; α(L)=0.000658 *10*; α(M)=0.0001515 *22* α(N)=3.77×10^{-5} *6*; α(O)=6.96×10^{-6} *10*; α(P)=4.82×10^{-7} *7*; α(IPF)=0.0001059 *17*

† From 2013Mo20, unless otherwise stated.
‡ For absolute intensity per 100 decays, multiply by ≈0.545.
# 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.
^{x} γ ray not placed in level scheme.

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