Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 195,368 (2024)	1-Dec-2023

Q(β^-)=−8933 *18*; S(n)=8577 *15*; S(p)=1762 *22*; Q(α)=7493 *5* 2021Wa16

Identification: ^{100}Mo(^{94}Mo,3n) excitation function and systematics of α-particle energies (1993Qu03); ^{96}Mo(^{96}Mo,n) (1997Ba25), ^{160}Dy(^{36}Ar,5n) E=196 MeV (1999An36).

^{191}Po Levels

Tentative level scheme adopted from 2002An19 (HI,Xnγ).

Cross Reference (XREF) Flags

A ^{195}Rn α decay (6 ms)
B ^{195}Rn α decay (5 ms)
C (HI,xnγ)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
0.0	(3/2$^-$)	22 ms *1*	A C	%α≈100 J^π: Based on systematics of heavier Po isotopes: all the odd-A Po isotopes from 193 to 201 have been assigned an 3/2$^-$ ground state. Supporting evidence is provided by the hindrance factors 2.9 *4* and 1.6 *5* for 7334 keV *5* and 6966 keV *10* Eα from this level to (3/2$^+$) states in ^{187}Pb using $r_0(^{187}Pb)$=1.5126 *20* from the adjacent even-even nuclides in 2020Si16 and Qα=7493 *5*. The similar character of the decays to both the spherical $\nu p_{3/2}\otimes\pi$(0p−0h) low-spin (3/2$^-$) isomeric state and to the excited (3/2$^-$) level with an oblate $\nu p_{3/2}\otimes\pi$(2p−2h) intruder configuration in ^{187}Pb (1999An10,2001Hu21), can be explained by assuming a mixed structure for this state, with contributions from both spherical $\nu 3p_{3/2}\otimes\pi$(2p−0h) and deformed $\nu 3p_{3/2}\pi$(4p-2h) configurations (2002An19). $T_{1/2}$: From 7334α(t) (in 2002An19 (HI,xnγ)). Others: 27 ms *+22−8* (1997Ba25 − 7330α(t)), 15 ms *+7−3* (2001Ke06 − 7331α(t)), and 15.5 ms *+6−35* (1988QuZZ − 7314α(t)). %α: Not measured; assumed by 1999An10 based on systematics of %α for lightest Po isotopes. Using calculated partial half-life of α decay and β decay in 2019Mo01, one gets %α=99.98.
61[#] *11*	(13/2$^+$)[‡]	93 ms *3*	BC	%α≈100 Additional information 1. Isotope shift: $\Delta\langle r^2\rangle(^{191}Po, ^{210}Po)$=−0.350 fm^2 *40* and −0.553 fm^2 *40* (2013Se03). E(level): From 2021Ko07 (NUBASE). Others: Authors of 2013Sa43 proposed the isomeric level at 74 keV *15* considering the (13/2$^+$) state of ^{187}Pb at 33 keV *13*; 40 keV *15* in 2002An19 based on differences of the α-ray energies for the transitions from the ^{191}Po g.s. and isomeric levels, to levels in ^{187}Pb. J^π: For this isomeric level an oblate structure with a $\nu i_{13/2}\otimes\pi$(4p−2h) configuration has been proposed (1999An10,2002An19), which would explain the unhindered nature of the E(α)=6888 keV decay to the $\nu i_{13/2}\otimes\pi$(2p−2h) (13/2$^+$) excited level in ^{187}Pb. 2002An19 report HF=0.76 *17* for 6888α to the (13/2$^+$) isomeric level in ^{187}Pb. Using the value $r_0(^{187}Pb)$=1.5126 *20*, (as noted in g.s. comment) one gets similar value as HF=0.8 *2*. $T_{1/2}$: From 2002An19 in (HI,xnγ) (supersedes their earlier value 98 ms *8* (1999An10)). Others: 95 ms *+130−60* and 110 ms *+70−30* (2001Ke06 − from 7364α(t) and 6878α(t), respectively). %α: 1999An10 assumed %α≈100, based on systematics of %α for lightest Po isotopes.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{191}Po Levels (continued)

E(level)[†]	Jπ	XREF
323[#]	(17/2+)[‡]	C
690[#]	(21/2+)[‡]	C
1154[#]	(25/2+)[‡]	C
1693?[#]	(29/2+)[‡]	C

† From γ-ray energies, except where otherwise noted.
‡ J^{π} sequence on the basis of assumed high-spin band structure built on a (13/2+) state.
# Band(A): Band based on (13/2+) state. This is the band comprising the favored sequence of γ transitions. Built on the basis of γ energy sequence and γγ coincidences.

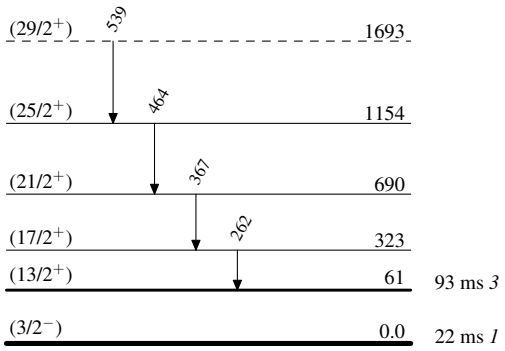
γ(^{191}Po)

E_i(level)	J_i^{π}	E_{γ}[†]	E_f	J_f^{π}
323	(17/2+)	262	61	(13/2+)
690	(21/2+)	367	323	(17/2+)
1154	(25/2+)	464	690	(21/2+)
1693?	(29/2+)	539[‡]	1154	(25/2+)

† From (HI,Xnγ).
‡ Placement of the transition in the level scheme is uncertain.

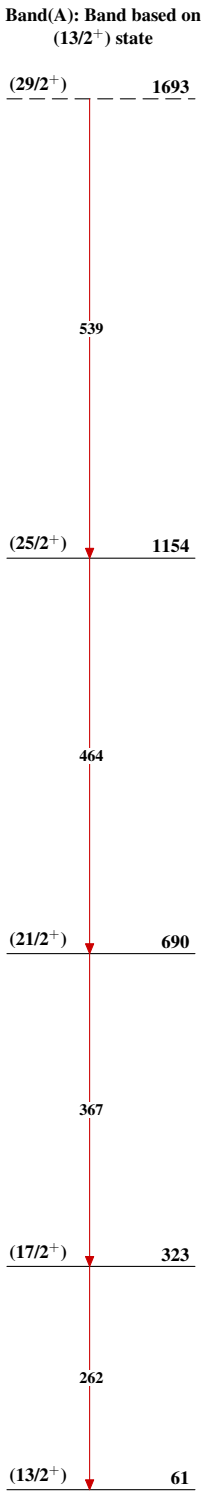
Adopted Levels, Gammas

Level Scheme



$^{191}_{84}Po_{107}$

Adopted Levels, Gammas



$^{191}_{84}Po_{107}$