Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 181, 475 (2022)	1-Jan-2022

Q(β^-)=2028 *8*; S(n)=3726 *7*; S(p)=8.94×10^3 *SY*; Q(α)=2.98×10^3 *SY* 2021Wa16
ΔS(p)=200 (syst), ΔQ(α)=150 (syst) 2021Wa16.
Assignment: descendant of ^{221}Rn, parent of ^{213}Bi (1964Bu05).
2020De36: ^{238}U(^{48}Ca,X), E=233.3 MeV; measured multi-nucleon transfer reaction cross section $\sigma_{cumulative}$=139 nb/sr *4* for ^{213}Pb.
Calculation of isotope shifts and nuclear change radii:
1990Du03: Calculated isotope shifts and nuclear charge radii for lead isotopes using an enlarged superfluid model.
1987Sa51: Calculated isotope shifts of lead nuclei by including perturbations due to giant monopole and giant quadrupole resonances.
1987Za02: Calculated nuclear charge radius using the HFB method. The calculations were done including a separable four-body interaction and also a three-body contact force in the procedure. Their calculations, which were carried out also for other lead nuclei as well as for mercury isotopes in the region and for tin isotopes, by using an effective interaction, reproduced the odd-even staggering. These calculations were compared with experiments.
1984He17: Calculated lead radii relative to ^{208}Pb radius.

^{213}Pb Levels

Cross Reference (XREF) Flags

- A ^{213}Tl β^- decay (23.8 s)
- B ^{217}Po α decay
- C ^{9}Be(^{238}U,Xγ)

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	(9/2$^+$)	10.2 min *3*	ABC	%β^-=100 T$_{1/2}$: From 1964Bu05: measured from growth of ^{213}Bi. J$^\pi$: favored α decay (HF=1.4) suggest a g$_{9/2}$ to g$_{9/2}$ transition between ^{217}Po and ^{213}Pb ground states (2004Li28). Also from analogy to ^{215}Po and ^{217}Rn isotones. Suggested configuration: ν (g$^{+1}_{9/2}$).
675	(5/2$^+$,7/2$^+$)		A	J$^\pi$: From 2014Mo02 (^{213}Tl β- decay (23.8 s)) based on shell-model predictions.
772.0 *10*	(13/2$^+$)‡		C	
1083.2 *14*	(15/2$^+$)#		C	
1141.0 *15*	(17/2$^+$)‡		C	
1259.8 *14*	(17/2$^+$)#		C	
1331.0 *18*	(21/2$^+$)‡	0.26 ms *2*	C	Suggested configuration: ν (g$^{+3}_{9/2}$). T$_{1/2}$: From sum of (176,190,311,369,488 and 772)γ(t) (^{238}U,X).

† From Eγ.
‡ Based on 190-369-772 γ cascade from (21/2$^+$) seniority isomer to (17/2$^+$) → (13/2$^+$) → (9/2$^+$) g.s. in (^{238}U,Xγ), supported by shell model calculations.
# Based on shell model calculations (^{238}U,Xγ).

Adopted Levels, Gammas (continued)

$\gamma(^{213}Pb)$

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	α #	Comments
675	$(5/2^+,7/2^+)$	675	100	0.0	$(9/2^+)$			E_γ,I_γ: From ^{213}Tl β- decay (23.8 s).
772.0	$(13/2^+)$	772 *1*	100	0.0	$(9/2^+)$			
1083.2	$(15/2^+)$	311‡ *1*	100	772.0	$(13/2^+)$			
1141.0	$(17/2^+)$	369 *1*	100	772.0	$(13/2^+)$			
1259.8	$(17/2^+)$	176‡ *2*	9 *8*	1083.2	$(15/2^+)$			
		488 *1*	100 *9*	772.0	$(13/2^+)$			
1331.0	$(21/2^+)$	190 *1*	100	1141.0	$(17/2^+)$	[E2]	0.512 *12*	B(E2)(W.u.)=7.7×10^{-5} *+7–6*

† From (^{238}U,Xγ).
‡ The ordering of 176γ and 311γ is supported by the proposed level scheme (^{238}U,Xγ).
# 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.

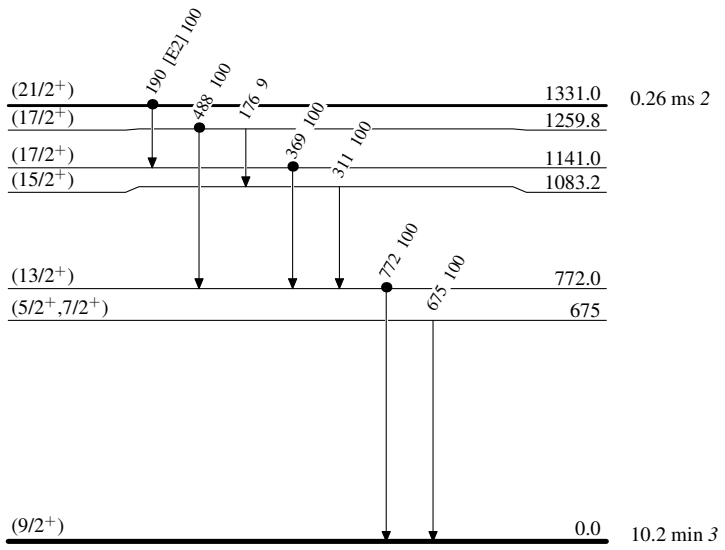
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

● Coincidence



$^{213}_{82}Pb_{131}$