Adopted Levels, Gammas

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

Q(β^-)=−5979 *15*; S(n)=9230 *25*; S(p)=949 *16*; Q(α)=7498 *4* 2021Wa16
Assignment: ^{209}Bi(^{12}C,8n) excit (1961Gr42,1968Va04); ^{197}Au(^{20}Ne,4n) excit (1968Va04); ^{203}Tl(^{16}O,6n) excit (1968Va04); ^{205}Tl(^{16}O,8n) excit (1968Va04); parent of ^{209}Fr (1968Va04).
2002Sa22, 2003Ik01: ^{138}Ba(^{82}Se,p6n), E(cm)=193-251 MeV and ^{134}Ba(^{82}Se,p2n); measured evaporation residue cross section σ.
2002Mi20: ^{154}Sm(^{64}Ni,p4n), E=4-5 MeV/nucleon, measured evaporation residue cross section σ.
2015Ma63: ^{162}Dy(^{54}Cr,p2n), E=5.1 MeV/nucleon, measured evaporation residue cross section σ.

^{213}Ac Levels

Cross Reference (XREF) Flags

A ^{217}Pa α decay (3.8 ms)
B ^{217}Pa α decay (1.08 ms)

E(level)†	J$^\pi$	$T_{1/2}$	XREF	Comments
0.0	9/2$^-$	738 ms *16*	AB	%α≈100 μ=+4.2 *4* Only α decay was observed. Eα=7360 keV *30* (1997Mi03). Possible ε decays to 1608.85 (9/2$^-$) and 546.35 (5/2$^-$) levels are expected to be <25% and <0.05%, if log *ft*>3.6 and log f^1t>8.5, respectively. β gross theory calculations by 1973Ta30 give $T_{1/2}(\beta^+)$≈50 s, which suggests %(ε+β^+)≈1.6. J$^\pi$: Favored α decay to ^{209}Fr g.s. (J$^\pi$=9/2$^-$). Also J=(9/2) has been proposed in 2017Fe10, based on direct HFS measurements. Configuration: π ($h^{+1}_{9/2}$). $T_{1/2}$: Weighted average of 731 ms *17* (2000He17) and 800 ms *50* (1968Va04). Other: ≈1 s (1961Gr42). μ: From 2019StZV, 2017Gr18 − in-gas laser ionization and spectroscopy (IGLIS). Also see 2017Fe10.
466.50 *20*			AB	
612.80 *10*			AB	
634.30 *10*			AB	J$^\pi$: Tentative J^π=(13/2$^-$) in 2002He29.
1063.20 *15*			B	
1884.00 *25*			B	J$^\pi$: Tentative J^π=(21/2$^-$) in 2002He29.

† From Eγ.

γ(^{213}Ac)

E$_i$(level)	E$_\gamma$†	E$_f$	J$^\pi_f$
466.50	466.5 *2*	0.0	9/2$^-$
612.80	612.8 *1*	0.0	9/2$^-$
634.30	634.3 *1*	0.0	9/2$^-$
1063.20	450.4 *1*	612.80	
1884.00	820.8 *2*	1063.20	

† From ^{217}Pa α decay (1.08 ms).

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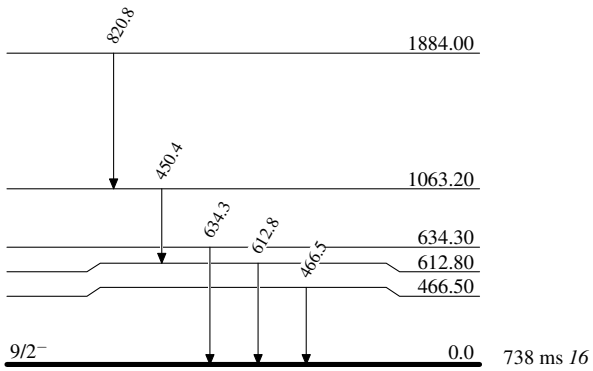
Level Scheme



$^{213}_{89}Ac_{124}$