^{209}Bi(^{12}C,4nγ):delayed γ **1983GoZX,1982GoZU**

1983GoZX, 1983GoZP, 1982GoZU, 1982SaZO: E(^{12}C)=77, 80 MeV pulsed beam; measured Eγ, Eα, $\gamma\gamma$ and $\alpha\gamma$ at the Tandem accelerator laboratory of Tsukuba University. Details of this study are not available.

From delayed γ spectrum, 1983GoZX and 1982SaZO suggest that all the levels were populated by an isomer of 810 ns half-life located above the 3263 level.

Besides the two main α transitions of 9650 and 10590 keV which are seen by 1985De14, 1983GoZX report several additional α transitions at 9740, 10860, 11030, 11280, 11400, 11540, 12150 and 12330 keV, none of which are reported by 1985De14. Further, 1983GoZX place 11280α from 1682 level, and 12330α from 2762 level, both to the ^{213}Fr g.s.

^{217}Ac Levels

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$	Comments
0.0	9/2$^-$	75 ns 3	T$_{1/2}$: from $\alpha\gamma$-coin decay curve (1982GoZU). Eα=9650 keV to ^{213}Fr g.s.
660.3 3	13/2$^-$		
670.1 3	(11/2$^-$)		
957[‡]			No gamma transition reported in 1983GoZX and 1982GoZu from this level; Eα=10590 keV from this level to ^{213}Fr g.s. reported. This level and its decay by 10590α is not reported by 1985De14 (See ^{217}Ac IT decay dataset). Instead, a 10540α is placed by 1985De14 from 2013 level to the ^{213}Fr g.s.
1019.2 4			E(level): this level corresponds to 1149 level in 1985De14, as the ordering of the 478.9-349.0 γ cascade is reversed in 1985De14.
1146.6 4	17/2$^-$		
1498.1 4	21/2$^-$		J$^{\pi}$: 19/2$^-$ in Adopted Levels.
1528.4 5	21/2$^-$		
1682.2 6	25/2$^-$		J$^{\pi}$: (23/2)$^-$ in Adopted Levels. Eα=11280 keV to ^{213}Fr g.s. This α is not reported by 1985De14. T$_{1/2}$: $\approx$100 ns (1982SaZO).
2009.8[‡] 7	29/2$^-$		J$^{\pi}$: 25/2$^-$ is expected for J(1682)=(23/2)$^-$.
2389.8[‡] 7	31/2$^{(+)}$		J$^{\pi}$: 29/2$^{(+)}$ is expected for J(1682)=(23/2)$^-$ and J(2010)=25/2$^-$.
2761.5[‡] 8			Eα=12330 keV to ^{213}Fr g.s. This α is not reported by 1985De14.
3263.1[‡] 9			

[†] From least-squares fit, assuming 0.3 keV uncertainty for each γ ray.
[‡] This level is not included in the Adopted Levels, Gammas dataset due to its tentative nature.
[#] As proposed by 1983GoZX and 1982GoZU, which the authors state are based on their $\gamma(\theta)$ data.

$\gamma(^{217}$Ac)

E$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	E$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
^{x}75[‡]					349.0[@]	1019.2		670.1	(11/2$^-$)
^{x}122[‡]					351.5	1498.1	21/2$^-$	1146.6	17/2$^-$
153.8	1682.2	25/2$^-$	1528.4	21/2$^-$	371.7[#]	2761.5		2389.8	31/2$^{(+)}$
^{x}156[‡]					380.0[#]	2389.8	31/2$^{(+)}$	2009.8	29/2$^-$
(190[#])	1146.6	17/2$^-$	957		381.8	1528.4	21/2$^-$	1146.6	17/2$^-$
^{x}200[‡]					478.9[@]	1498.1	21/2$^-$	1019.2	
327.6[#]	2009.8	29/2$^-$	1682.2	25/2$^-$	486.4	1146.6	17/2$^-$	660.3	13/2$^-$

$^{209}\text{Bi}(^{12}\text{C},4\text{n}\gamma)$:delayed γ **1983GoZX,1982GoZU (continued)**

$\gamma(^{217}\text{Ac})$ (continued)

E_γ[†]	E_i(level)	J^π_i	E_f	J^π_f
501.6[#]	3263.1		2761.5	
660.3	660.3	$13/2^-$	0.0	$9/2^-$
670.1	670.1	$(11/2^-)$	0.0	$9/2^-$

[†] From 1983GoZX (also 1982GoZU), unless otherwise stated.

[‡] Unplaced γ from 1983GoZP only, seen in delayed $\gamma\gamma$-coin spectrum.

[#] This γ ray is not included in the Adopted Levels, Gammas dataset due to its tentative nature.

[@] Ordering of the 478.9-349.0 γ cascade is reversed in 1985De14, thus defining the intermediate level at 1149 keV instead of 1019 as in 1983GoZX. In the Adopted dataset, the ordering is from 1985De14.

[x] γ ray not placed in level scheme.

^{209}Bi(^{12}C,4nγ):delayed γ 1983GoZX,1982GoZU

Legend

Level Scheme

- - - - - ► γ Decay (Uncertain)

$^{217}_{89}Ac_{128}$