

<sup>206</sup>Pb(<sup>50</sup>Ti,2n $\gamma$ ) **2023Se09**

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Balraj Singh	ENSDF	22-Jun-2023

**2023Se09:** E(<sup>50</sup>Ti)=244 MeV from the ATLAS-ANL facility. Targets were 95.9% enriched in <sup>206</sup>Pb and 0.5 mg/cm<sup>2</sup> thick with a 40  $\mu$ g/cm<sup>2</sup> carbon layer on the front and 10 mg/cm<sup>2</sup> carbon layer on the back. Measured reaction products and recoiling from the target using the Argonne gas-filled analyzer (AGFA) and double-sided Si strip detector (DSSD), E $\gamma$ , K $\alpha$  and K $\beta$  x rays, (<sup>254</sup>Rf recoils) $\gamma$ -coin, (fission decays from <sup>254</sup>Rf) $\gamma$ -coin using the Gammasphere array with 65 and 70 detectors. The <sup>254</sup>Rf nuclei were identified through the observation of Rf K $\alpha$  and K $\beta$  x rays in coincidence with implants confirmed the assignment of  $\gamma$  rays to <sup>254</sup>Rf. Deduced ground-state rotational band up to 14<sup>+</sup>, and kinematic moment of inertia. Comparison with particle-number conserving cranked shell model (PNC-CSM) calculations. Statistics are low in this experiment as shown in the (<sup>254</sup>Rf) $\gamma$ -coin spectral Fig. 3 in **2023Se09**, where the identified  $\gamma$ -ray peaks (172, 232, 285, 339 and 384) have a total of  $\approx$ 15 counts, with five counts in the 172-keV peak assigned as 6<sup>+</sup>  $\rightarrow$  4<sup>+</sup> transition.

<sup>254</sup>Rf Levels

E(level) <sup>†</sup>	J $\pi$
0 <sup>#</sup>	0 <sup>+</sup>
48 <sup>‡</sup> <sup>#</sup> <i>calc</i>	(2 <sup>+</sup> )
158 <sup>‡</sup> <sup>#</sup> <i>calc</i>	(4 <sup>+</sup> )
330 <sup>#</sup>	(6 <sup>+</sup> )
562 <sup>#</sup>	(8 <sup>+</sup> )
847 <sup>#</sup>	(10 <sup>+</sup> )
1186 <sup>#</sup>	(12 <sup>+</sup> )
1570 <sup>#</sup>	(14 <sup>+</sup> )

<sup>†</sup> From E $\gamma$  data, unless otherwise indicated.

<sup>‡</sup> Deduced by **2023Se09** from fit to the 172-, 232-, 285-, 339-, and 384 keV  $\gamma$ -ray energies using the Harris formula. The low-energy transition from the level was not seen in the gamma spectrum as it is expected to be heavily converted.

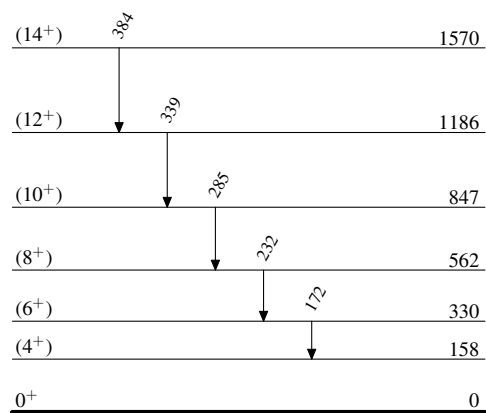
<sup>#</sup> Band(A): K $\pi$ =0<sup>+</sup>, g.s. band. Using the Harris formula, the (16<sup>+</sup>) and 18<sup>+</sup> members of the band were predicted by **2023Se09** at 1992 keV and 2462 keV, respectively, the (16<sup>+</sup>) decaying by 420-keV  $\gamma$  and (18<sup>+</sup>) by 470-keV  $\gamma$ , with two counts for the 470-keV in the (<sup>254</sup>Rf) $\gamma$ -coin spectrum.

$\gamma$ (<sup>254</sup>Rf)

E $\gamma$	E <sub>i</sub> (level)	J $\pi$ <sub>i</sub>	E <sub>f</sub>	J $\pi$ <sub>f</sub>
172	330	(6 <sup>+</sup> )	158	(4 <sup>+</sup> )
232	562	(8 <sup>+</sup> )	330	(6 <sup>+</sup> )
285	847	(10 <sup>+</sup> )	562	(8 <sup>+</sup> )
339	1186	(12 <sup>+</sup> )	847	(10 <sup>+</sup> )
384	1570	(14 <sup>+</sup> )	1186	(12 <sup>+</sup> )

${}^{206}\text{Pb}({}^{50}\text{Ti}, 2n\gamma)$  2023Se09

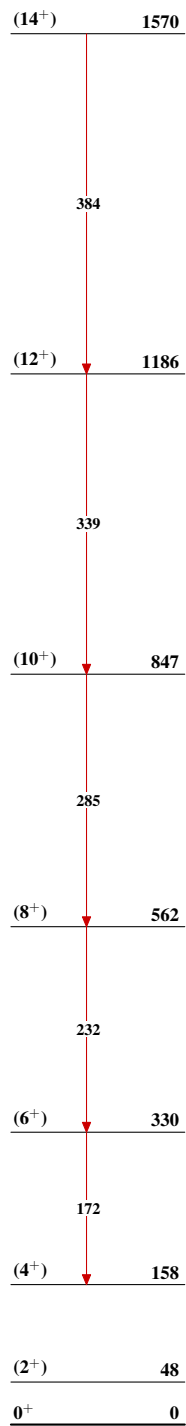
Level Scheme



${}^{254}_{104}\text{Rf}_{150}$

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Band(A):  $K^\pi=0^+$ , g.s.  
band

 $^{254}_{104}\text{Rf}_{150}$