^{198}Pt(^{26}Mg,5nγ) 2009Re09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh et al. ,	NDS 175,1 (2021)	19-May-2021

Includes ^{174}Yb(^{48}Ca,3nγ) from 2020Od01.

2009Re09 (also 2011Re04, 2007Re14): E=128 MeV ^{26}Mg beam produced by the ATLAS accelerator at Argonne National Laboratory. The γ rays were detected using the Gammasphere array, consisting of 98 HPGe detectors with BGO Compton suppression shields. The 64-element detector HERCULES was used to measure evaporation residues. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma$(lin pol), (particle)$\gamma\gamma$ coin, (x ray)γ coin, $\gamma(\theta)$. Deduced parity-doublet bands and quadrupole-octupole collectivity. 2009Re09 stated that a detailed version of this work was forthcoming, but none has appeared as of April 2021.

Other:

2020Od01: ^{174}Yb(^{48}Ca,3nγ),E=207 MeV. Measured angular anisotropy ratios of the 362 and 537 γ rays, in authors' main investigation of ^{218}Th structure at the K130 cyclotron facility of University of Jyvaskyla.

^{219}Th Levels

E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0.0[#]	9/2$^+$	966.9[&] *4*	15/2$^+$	1375.6[&] *4*	19/2$^+$	1752.3[&] *5*	23/2$^+$
362.5[&] *3*	11/2$^+$	968.1[@] *4*	15/2$^-$	1436.5[@] *4*	19/2$^-$	1968.6 *6*	27/2$^+$
536.7[#] *3*	13/2$^+$	1049.3[#] *4*	17/2$^+$	1519.5[#] *5*	21/2$^+$	1974.4[#] *6*	25/2$^+$
609.9[a] *4*	13/2$^-$	1174.3[a] *4*	17/2$^-$	1725.9[a] *5*	21/2$^-$	2322.0 *7*	29/2$^{(+)}$

[†] From least-squares fit to Eγ data, assuming 0.3 keV uncertainty for each γ ray.

[‡] As assigned in 2009Re09 based on quadrupole-octupole band structures.

[#] Band(A): Band based on 9/2$^+$, s=+i. Configuration=$\nu g^3_{9/2}$.

[@] Band(a): Band based on 15/2$^-$, s=+i. Parity doublet band with 9/2$^+$ band. Configuration=$\nu g^3_{9/2}\otimes$(octupole phonon).

[&] Band(B): Band based on 11/2$^+$, s=−i. Configuration=$\nu i_{11/2}\otimes\nu g^2_{9/2}$.

[a] Band(b): Band based on 13/2$^-$, s=−i. Parity doublet band with 11/2$^+$ band. Configuration=$\nu i_{11/2}\otimes\nu g^2_{9/2}\otimes$(octupole phonon).

$\gamma(^{219}$Th)

E$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
80.8	1049.3	17/2$^+$	968.1	15/2$^-$		
174.0	536.7	13/2$^+$	362.5	11/2$^+$		
201.3	1375.6	19/2$^+$	1174.3	17/2$^-$	(E1)	
207.2	1174.3	17/2$^-$	966.9	15/2$^+$		
216.3[†]	1968.6	27/2$^+$	1752.3	23/2$^+$		
247.4[†]	609.9	13/2$^-$	362.5	11/2$^+$	(E1)	
326[#]	1375.6	19/2$^+$	1049.3	17/2$^+$		
350.4	1725.9	21/2$^-$	1375.6	19/2$^+$		
353.4[†]	2322.0	29/2$^{(+)}$	1968.6	27/2$^+$		
356.9	966.9	15/2$^+$	609.9	13/2$^-$		
362.4[†]	362.5	11/2$^+$	0.0	9/2$^+$	(M1)	R(θ)=0.90 *12* (2020Od01), consistent with ΔJ=1, dipole.
376.7[†]	1752.3	23/2$^+$	1375.6	19/2$^+$		
387.2[†]	1436.5	19/2$^-$	1049.3	17/2$^+$		
408.8	1375.6	19/2$^+$	966.9	15/2$^+$		
430[#]	966.9	15/2$^+$	536.7	13/2$^+$		
431.5[†]	968.1	15/2$^-$	536.7	13/2$^+$		
454.9[†]	1974.4	25/2$^+$	1519.5	21/2$^+$		
468.4	1436.5	19/2$^-$	968.1	15/2$^-$		

Continued on next page (footnotes at end of table)

^{198}Pt(^{26}Mg,5nγ) 2009Re09 (continued)

$\gamma(^{219}Th)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
470.2[†]	1519.5	$21/2^+$	1049.3	$17/2^+$		
512.6[†]	1049.3	$17/2^+$	536.7	$13/2^+$		
536.8[†]	536.7	$13/2^+$	0.0	$9/2^+$	(Q)	Mult.: from R(θ)=1.10 *7* (2020Od01), consistent with ΔJ=2, quadrupole.
551.5	1725.9	$21/2^-$	1174.3	$17/2^-$		
564.5[†]	1174.3	$17/2^-$	609.9	$13/2^-$		
604.4[†]	966.9	$15/2^+$	362.5	$11/2^+$		

[†] Strong γ ray as implied by arrow thickness in level-scheme Fig. 1 of 2009Re09.
[‡] From $\gamma\gamma$(lin pol) and/or from intensity balance, unless otherwise stated. Details are not provided in 2009Re09.
[#] Placement of transition in the level scheme is uncertain.

Legend

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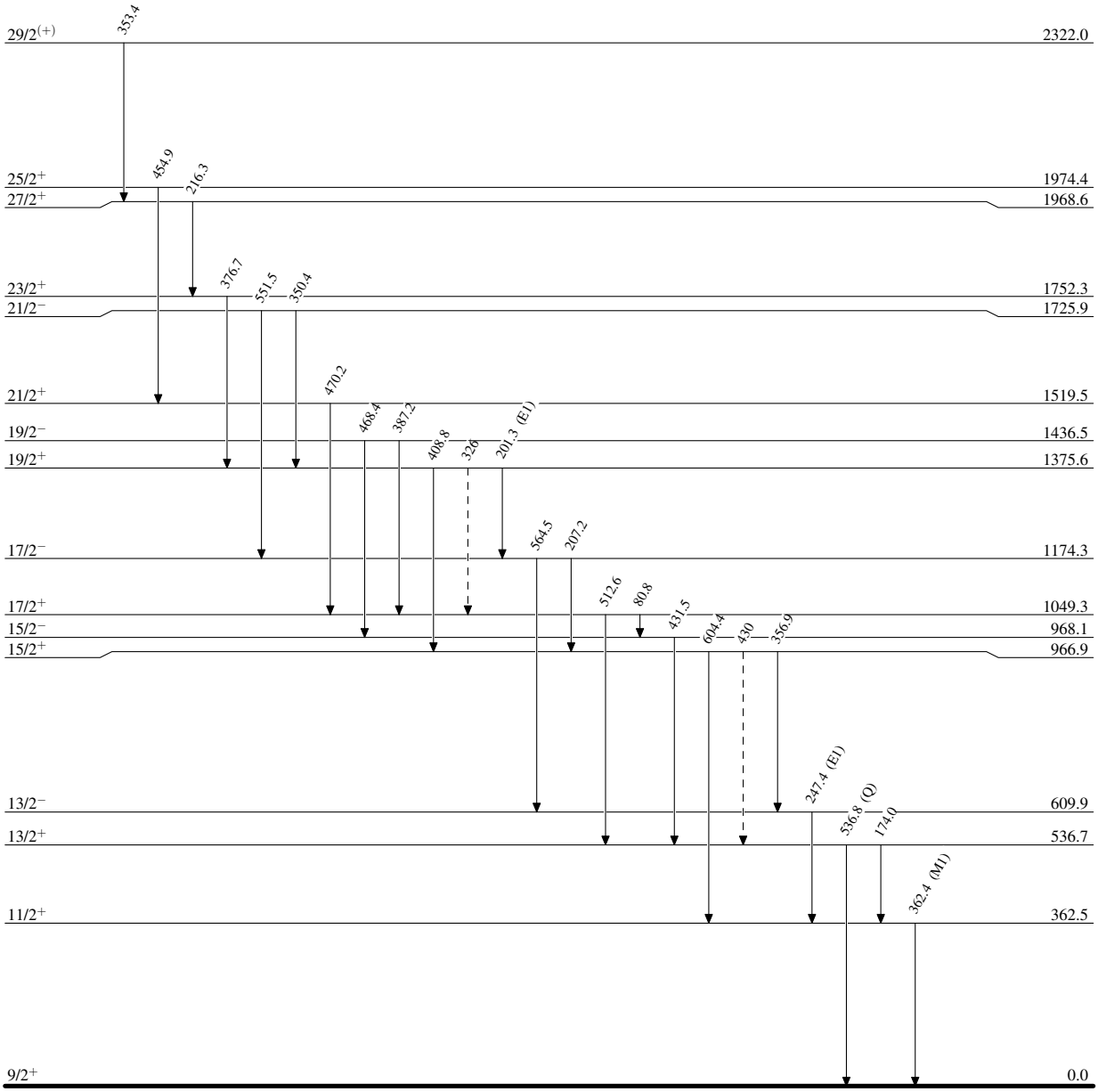
Level Scheme

γ Decay (Uncertain)



$^{219}_{90}Th_{129}$

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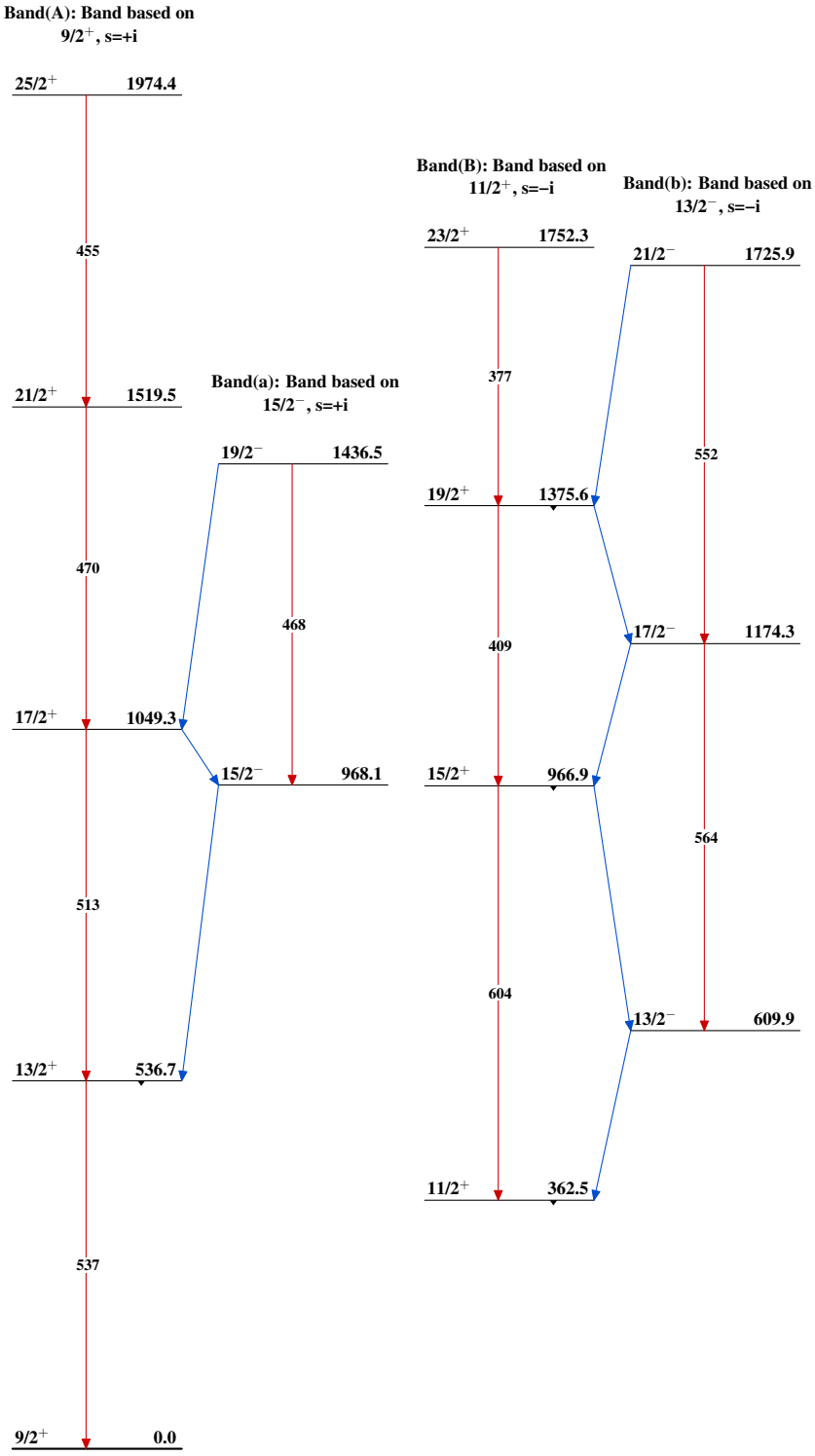

$^{219}_{90}Th_{129}$