^{60}Ni(^{40}Ca,3pγ) 1986Pi03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 111, 525 (2010)	19-Nov-2009

Also ^{66}Zn(^{35}Cl,2p2nγ), ^{70}Ge(^{32}S,3p2nγ).

1986Pi03: ^{60}Ni(^{40}Ca,3pγ), E(^{40}Ca)=140 MeV (lab); measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, excit. ^{66}Zn(^{35}Cl,2p2nγ), E(^{35}Cl)=165 MeV (lab) and ^{70}Ge(^{32}S,3p2nγ), E(^{32}S)=130 MeV (lab), measured $\gamma(\theta)$. Ge(Li) detectors (resolution 2.2 keV at 1330 keV).

^{97}Rh Levels

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
0.0	9/2$^+$	1962.3@	19/2$^+$	3551.1@	25/2$^+$	5973.7&	(31/2)$^-$
258.8	1/2$^-$	2225.4&	17/2$^-$	4015.2@	27/2$^+$	6190.0	
265.0	7/2$^+$	2272.8?‡		4074.4&	(25/2)$^-$	6441.2	
475.2	5/2$^+$	2617.5@	21/2$^+$	4274.9@	29/2$^+$	6773.8	
857.7@	13/2$^+$	3055.8&	(21/2)$^-$	4824.1@	31/2$^+$	7103.3[a]	
1058.0		3096.2	(21/2)$^+$	5159.3&	(29/2)$^-$		
1463.6@	15/2$^+$	3259.8@	23/2$^+$	5193.6[a]			
1553.3@	17/2$^+$	3345.3?#		5515.9			

† Assignments proposed by the authors, based on $\gamma\gamma$, $\gamma(\theta)$, excit and Iγ results.

‡ The ordering of the 310.5- and 823.3-keV transitions could not be determined; therefore, this level could be either at 2272.8 or at 2785.9 keV.

The ordering of the 289.6- and 728.9-keV transitions could not be determined; therefore, this level could be either at 3345.4 or at 3784.7 keV.

@ Yrast state established by cascading γ's.

& Negative parity yrast state, established by cascading γ's.

[a] Level not observed In (^{36}S,4nγ) – not ADOPTED.

γ(^{97}Rh)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.†	δ†	I$_{(\gamma+ce)}$	Comments
89.4 *4*		1553.3	17/2$^+$	1463.6	15/2$^+$			11.4 *22*	I$_{(\gamma+ce)}$: obtained from coincidence intensities of preceding and following transitions.
163.8 *4*	1.9‡ *15*	3259.8	23/2$^+$	3096.2	(21/2)$^+$				
210.1 *5*	1.7 *11*	475.2	5/2$^+$	265.0	7/2$^+$				
258.8		258.8	1/2$^-$	0.0	9/2$^+$				
259.62 *15*	28.8‡ *22*	4274.9	29/2$^+$	4015.2	27/2$^+$				
264.98 *25*	33.6 *6*	265.0	7/2$^+$	0.0	9/2$^+$				
289.58 *25*	13.7 *4*	3345.3?		3055.8	(21/2)$^-$				
291.5 *4*	16‡ *3*	3551.1	25/2$^+$	3259.8	23/2$^+$	(M1+E2)	+0.05 *8*		
310.53 *20*	6‡ *3*	2272.8?		1962.3	19/2$^+$				
408.96 *20*	72.1 *7*	1962.3	19/2$^+$	1553.3	17/2$^+$	(M1+E2)	−0.04 *4*		
464.18 *20*	33.8 *7*	4015.2	27/2$^+$	3551.1	25/2$^+$	(M1+E2)	>+0.09		
467.47 *20*	7.0 *5*	6441.2		5973.7	(31/2)$^-$				
475.2	24.2 *8*	475.2	5/2$^+$	0.0	9/2$^+$				
583.1 *5*	≈1	1058.0		475.2	5/2$^+$				
605.89 *25*	34.4 *9*	1463.6	15/2$^+$	857.7	13/2$^+$	(M1+E2)	+0.27 *5*		
642.29 *25*	6.7‡ *25*	3259.8	23/2$^+$	2617.5	21/2$^+$				

Continued on next page (footnotes at end of table)

^{60}Ni(^{40}Ca,3pγ) 1986Pi03 (continued)

γ(^{97}Rh) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
655.25 *15*	32.6 *11*	2617.5	$21/2^+$	1962.3	$19/2^+$		
672.17 *25*	6.3 *9*	2225.4	$17/2^-$	1553.3	$17/2^+$		
695.61 *20*	77.3 *9*	1553.3	$17/2^+$	857.7	$13/2^+$	(E2)	
723.91 *15*	27‡ *3*	4274.9	$29/2^+$	3551.1	$25/2^+$		
728.93 *20*	13.0 *10*	4074.4	$(25/2)^-$	3345.3?			
[x]749.5 *4*	3.9‡ *21*						In coin with upper transitions in negative parity cascade, not in coin with 857.7 G.
755.71 *15*	34‡ *3*	4015.2	$27/2^+$	3259.8	$23/2^+$		
761.68 *20*	32‡ *3*	2225.4	$17/2^-$	1463.6	$15/2^+$	D	Mult.: $\Delta J=1$ transition.
792.7 *3*	9‡ *3*	1058.0		265.0	$7/2^+$		
808.89 *20*	18.6 *7*	4824.1	$31/2^+$	4015.2	$27/2^+$	(E2)	
814.41 *20*	9.7 *8*	5973.7	$(31/2)^-$	5159.3	$(29/2)^-$		
823.3 *4*	4.7 *5*	3096.2	$(21/2)^+$	2272.8?			
830.36 *25*	33‡ *4*	3055.8	$(21/2)^-$	2225.4	$17/2^-$		
857.71 *15*	100.0 *10*	857.7	$13/2^+$	0.0	$9/2^+$	(E2)	
934.25 *20*	30.9 *8*	3551.1	$25/2^+$	2617.5	$21/2^+$	(E2)	
1018.78 *20*	5.6 *8*	4074.4	$(25/2)^-$	3055.8	$(21/2)^-$	(E2)	
1064.16 *22*	14.1 *12*	2617.5	$21/2^+$	1553.3	$17/2^+$	(E2)	
1084.92 *22*	15.4 *10*	5159.3	$(29/2)^-$	4074.4	$(25/2)^-$	(E2)	
1134.0 *3*	7.3 *10*	3096.2	$(21/2)^+$	1962.3	$19/2^+$		
1178.4 *3*	7.9 *10*	5193.6		4015.2	$27/2^+$		γ not observed In (^{36}S,4nγ) – not ADOPTED.
1241.04 *25*	28.5 *10*	5515.9		4274.9	$29/2^+$		
1257.9 *5*	6.1 *9*	6773.8		5515.9			
1297.8 *3*	44.1 *12*	3259.8	$23/2^+$	1962.3	$19/2^+$	(E2)	
1365.9 *4*	5.0 *6*	6190.0		4824.1	$31/2^+$		
1587.4 *3*	12.4 *9*	7103.3		5515.9			γ assigned to 8364 adopted level (same As 8370 In (^{36}S,4nγ)).

[†] From $\gamma(\theta)$ in 1986Pi03, unless otherwise noted. Where the transition is stretched Q (or D+Q) from $\gamma(\theta)$ the transition is assumed to be (E2) (or (M1+E2)), respectively.

‡ Coincidence intensity given; single intensity is larger than the coincidence intensity.

[x] γ ray not placed in level scheme.

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Level Scheme

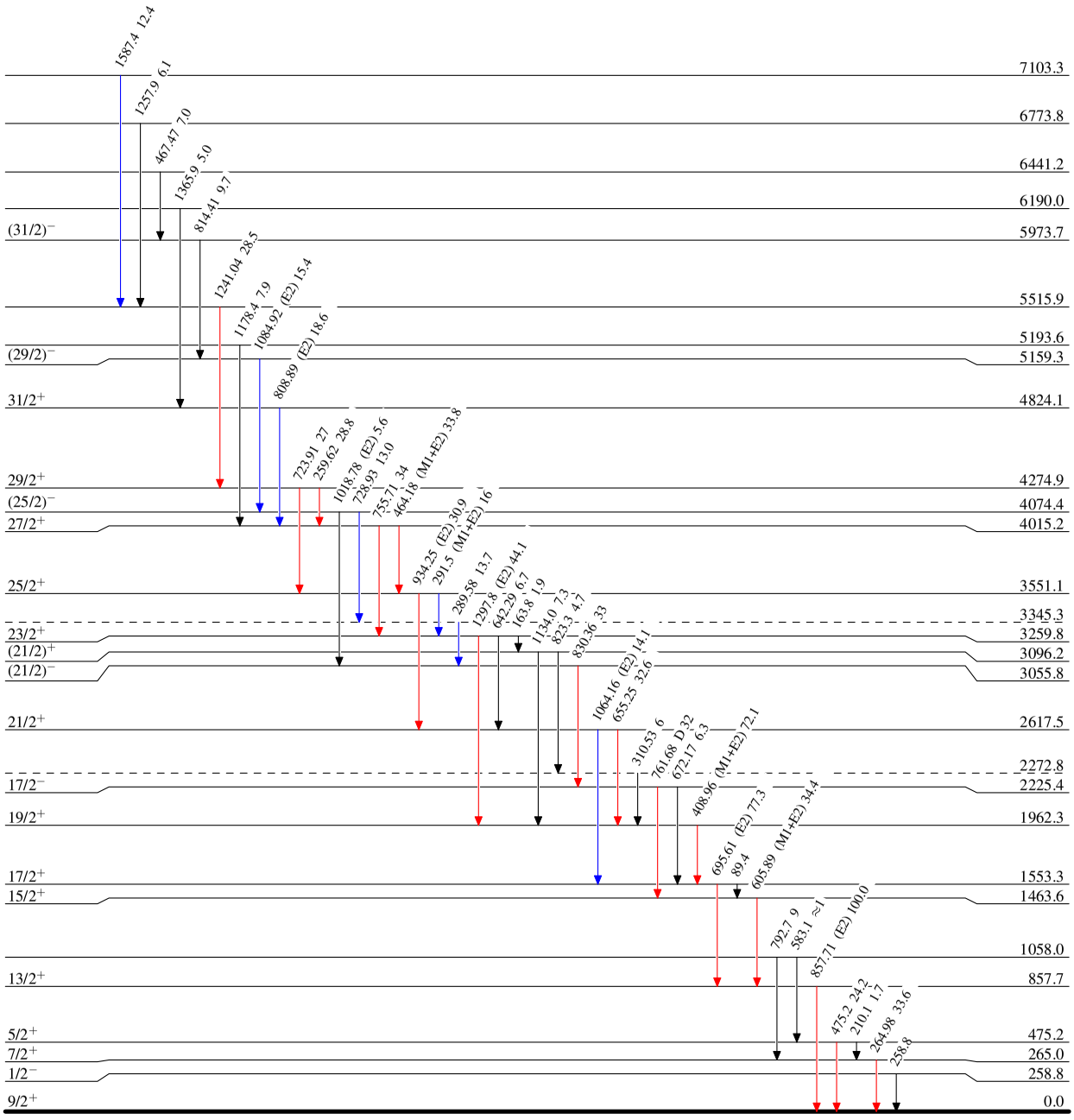
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{97}_{45}Rh_{52}$