

$^{40}\text{Ca}(^{58}\text{Ni},\alpha\text{pn}\gamma)$ 2007Pe14

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

$E(^{58}\text{Ni})=240$ MeV from ATLAS accelerator; ^{40}Ca target sandwiched between Au layers to reduce oxidation; GAMMASPHERE array (76 Ge detectors and Neutron Shell of 30 liquid scintillators); Microball array (95 CsI(Tl) detectors) for charged-particle detection; fragment mass analyzer; measured $E\gamma$, $I\gamma$, $\gamma\gamma$ coin, $\gamma(\theta)$.

No evidence was found for high-spin states in ^{92}Rh populated by the two-proton decay mode of a 6.7 MeV, (21^+) isomer of ^{94}Ag . Several scenarios (three possible level schemes shown in figure 4 of 2007Pe14) have been considered by 2007Pe14 but none gives a satisfactory possibility. While 2007Pe14 do not rule out such a decay mode, they place a limit of spin difference of $\Delta J > 10$ between the initial level ($^{94}\text{Ag}(21^+)$ isomer) and the final level (in ^{92}Rh).

^{92}Rh Levels

E(level) [†]	J^π [‡]	Comments
0.0@	6^+	
235.0@ 10	8^+	
599.8@ 13	9^+	
1271.2@ 13	10^+	
1549.1@ 14	11^+	
2152.2# 15	$11^{(-)}$	
2537.1@ 17	13^+	
2608.2 17	$12^{(-)}$	
2844.2# 17	$13^{(-)}$	
3197.1@ 20	15^+	
3780.2# 20	$15^{(-)}$	E(level): the order of the 1034 γ -936 γ cascade is not established, so E=3878, $J^\pi=14^{(-)}$ is a possible alternative.
4314.1@ 23	17^+	
4814.2# 22	$16^{(-)}$	
5420.1@ 25	19^+	
5753.2# 25	$18^{(-)}$	
6030@ 3	$20^{(+)}$	
6305@ 3	$21^{(+)}$	
6385# 3	$19^{(-)}$	E(level): the order of the 1420 γ -632 γ cascade is not established, so E=7173, $J^\pi=(20^-)$ would be a possible alternative.
6691 3	$20^{(-)}$	E(level): the order of the 1114 γ -306 γ cascade is not established, so E=7499 is also possible. alternatively, E=6059 or 6867 and $J^\pi=(20^-)$ if order of 1420 γ and 632 γ is reversed.
7805# 3	$21^{(-)}$	
9744# 3	$23^{(-)}$	

[†] From least-squares fit to $E\gamma$, allowing 1 keV uncertainty in all $E\gamma$ data.

[‡] Authors' suggested values. In Adopted Levels, all J^π values are considered to be tentative.

Band(A): $\pi\pi=-$ yrast sequence.

@ Band(B): $\pi\pi=+$ yrast sequence.

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								$\gamma(^{92}\text{Rh})$		
E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	δ^\ddagger	Comments		
235		235.0	8 ⁺	0.0	6 ⁺			E_γ, I_γ : transition not studied in this work due to expected long half-life (≈ 34 ns) of 235 level based on Weisskopf estimates.		
236	18.0 7	2844.2	13 ⁽⁻⁾	2608.2	12 ⁽⁻⁾	D+Q	-0.07 3	R(90°/0°)=0.60 5.		
275	12.0 6	6305	21 ⁽⁺⁾	6030	20 ⁽⁺⁾	D(+Q)	-0.04 6	Mult.: $\Delta J=1$; E1 is also possible. R(90°/0°)=0.60 8.		
278	30 3	1549.1	11 ⁺	1271.2	10 ⁺	D(+Q)	+0.01 5	R(90°/0°)=0.68 8.		
306 [‡]	10.0 8	6691	20 ⁽⁻⁾	6385	19 ⁽⁻⁾	D+Q	+0.11 5	R(90°/0°)=0.92 8.		
365	56 7	599.8	9 ⁺	235.0	8 ⁺	D+Q	-0.05 3	R(90°/0°)=0.57 5.		
456	24.0 23	2608.2	12 ⁽⁻⁾	2152.2	11 ⁽⁻⁾	D(+Q)	-0.05 5	R(90°/0°)=0.63 7.		
603	16.0 14	2152.2	11 ⁽⁻⁾	1549.1	11 ⁺					
610	16.0 12	6030	20 ⁽⁺⁾	5420.1	19 ⁺	D+Q	-0.05 3	R(90°/0°)=0.57 4.		
632 [‡]	20.0 13	6385	19 ⁽⁻⁾	5753.2	18 ⁽⁻⁾	D+Q	+0.25 4	R(90°/0°)=1.33 13.		
660	32.0 21	3197.1	15 ⁺	2537.1	13 ⁺	Q		R(90°/0°)=1.9 4.		
672	18.0 9	1271.2	10 ⁺	599.8	9 ⁺	D+Q	-0.20 6	R(90°/0°)=0.39 6.		
692	20.0 13	2844.2	13 ⁽⁻⁾	2152.2	11 ⁽⁻⁾	(Q)		R(90°/0°)=1.70 25.		
881	30 3	2152.2	11 ⁽⁻⁾	1271.2	10 ⁺	D(+Q)	-0.02 4	R(90°/0°)=0.68 7.		
936 [‡]	36 3	3780.2	15 ⁽⁻⁾	2844.2	13 ⁽⁻⁾	Q		R(90°/0°)=1.83 24.		
939	26 4	5753.2	18 ⁽⁻⁾	4814.2	16 ⁽⁻⁾	Q		R(90°/0°)=1.84 26.		
949	38.0 21	1549.1	11 ⁺	599.8	9 ⁺	Q		R(90°/0°)=2.1 3.		
988	40.0 23	2537.1	13 ⁺	1549.1	11 ⁺	Q		R(90°/0°)=2.3 4.		
1034 [‡]	34 3	4814.2	16 ⁽⁻⁾	3780.2	15 ⁽⁻⁾	D+Q	+0.27 5	R(90°/0°)=1.43 20.		
1036	44 7	1271.2	10 ⁺	235.0	8 ⁺	Q		R(90°/0°)=2.1 4.		
1106	20.0 6	5420.1	19 ⁺	4314.1	17 ⁺	Q		R(90°/0°)=2.1 6.		
1114 [‡]	8.0 2	7805	21 ⁽⁻⁾	6691	20 ⁽⁻⁾	D+Q	-0.14 9	R(90°/0°)=0.50 10.		
1117	26.0 21	4314.1	17 ⁺	3197.1	15 ⁺	Q		R(90°/0°)=2.4 7.		
1420 [‡]	12.0 9	7805	21 ⁽⁻⁾	6385	19 ⁽⁻⁾	Q		R(90°/0°)=1.70 21.		
1939	5.0 6	9744	23 ⁽⁻⁾	7805	21 ⁽⁻⁾	Q		R(90°/0°)=1.9 4.		

[†] Based on fit to measured $\gamma(\theta)$ in which initial and final spins, mixing ratio and alignment (σ/J) were optimized. values of γ asymmetry ($I(90^\circ)/I(0^\circ)$) resulting from the fitted curves are given in comments; this ratio exceeds 1.5 for all transitions assigned to $\Delta J=2$ placements and ranges from 0.4 to 1.4 for the $\Delta J=1$ placements.

[‡] The order of the following cascades is not established: 1420 γ -632 γ ; 1034 γ -936 γ and 1114 γ -306 γ .

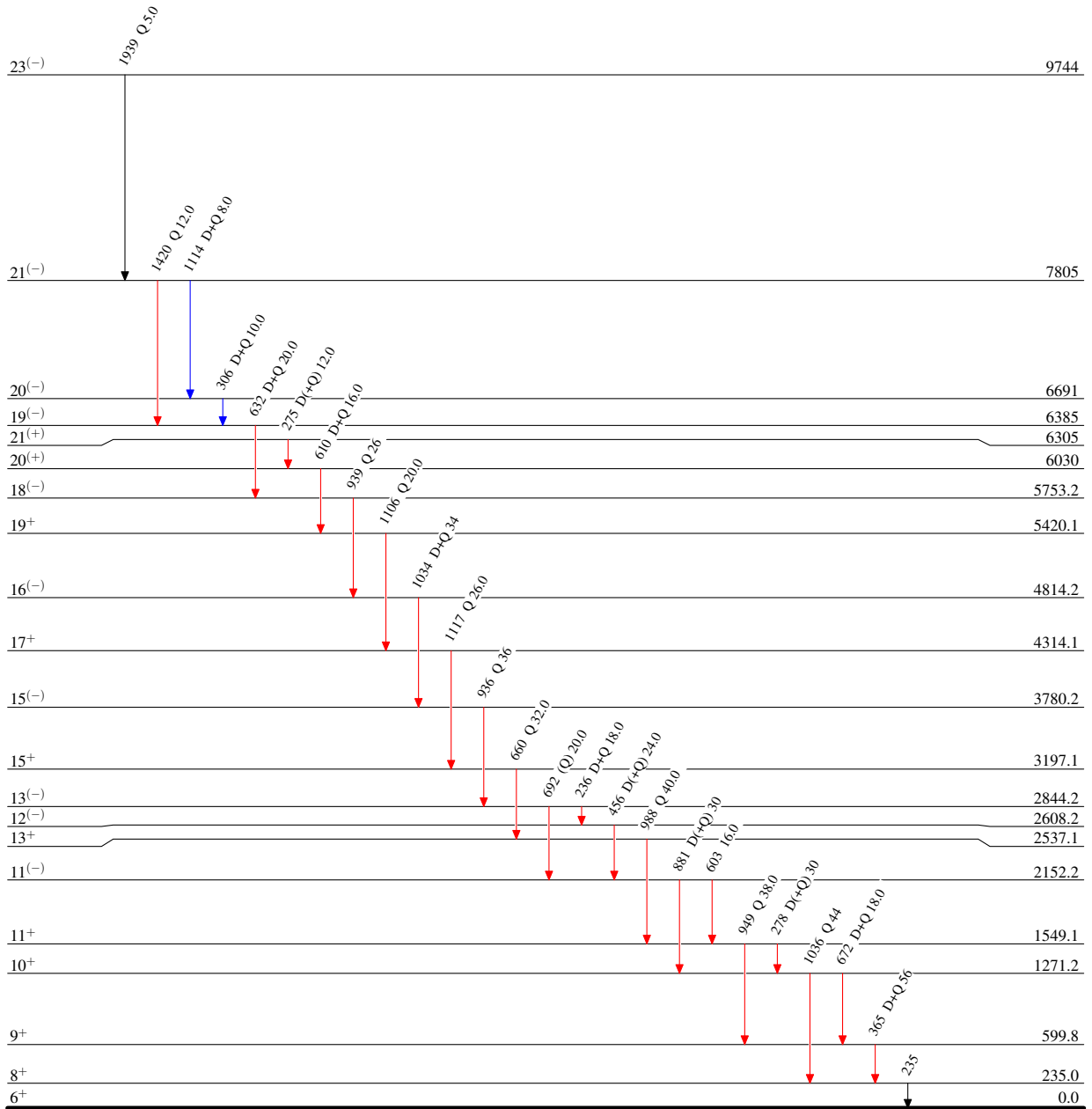
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Level Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

 $^{92}_{45}\text{Rh}_{47}$

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