

$^{54}\text{Fe}(^{40}\text{Ca,p}2\text{n}\gamma)$ 2005Ma55

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

E=130 MeV; 99% enriched ^{56}Fe self-supporting target; GASP spectrometer (40 Compton-suppressed HPGe detectors, 80 BGO-detector inner ball, the ISIS Si ball (charged-particle detection) and the n-ring array (for n detection)); measured $E\gamma$, $I\gamma$, $\gamma\gamma$ coin, particle- γ coin; spherical shell-model calculations in (π $2p_{1/2}, 1g_{9/2}$) model space.

^{91}Rh Levels

For detailed component configurations and wave functions of levels in ^{91}Rh , see table III of 2005Ma55.

E(level) [†]	$J^{\pi\ddagger}$	Comments
0.0 ^a	(9/2 ⁺)	
172.9 ^b 4	(1/2 ⁻)	possibly analogous to β -decaying 1/2 ⁻ isomeric states in ^{89}Tc and ^{87}Nb isotones.
792.1 ^{#b} 3	(5/2 ⁻)&	
840.41 ^a 10	(13/2 ⁺)@	
1292.07 ^b 24	(9/2 ⁻)&	
1787.01 ^a 23	(17/2 ⁺)@	
1905.45 ^b 24	(13/2 ⁻)&	
2277.7 ^b 4	(17/2 ⁻)&	
2568.3 4		
2655.4 ^a 3	(21/2 ⁺)@	
2873.5 [#] 5		
3102.6 ^a 4	(25/2 ⁺)@	
3114.2 ^b 4	&	
3133.9 5		
3312.3 6		
4135.9 ^a 5	(29/2 ⁺)@	
5218.5 ^a 5	@	J^{π} : possibly (33/2 ⁺) as shown in table I of 2005Ma55 for level fed by 665 γ .
5883.6 ^a 6	@	
7019.6 ^a 7	@	

[†] From least-squares fit to $E\gamma$.

[‡] Recommended by 2005Ma55; supported by measured multipolarity and systematics. these values have been ADOPTED.

[#] The order of the 439 γ -305 γ and 500 γ -619 γ cascades is not established; if reversed, E(level)=673 and 3007, respectively, instead of 792 and 2873.

@ Assuming that the Q 447 γ , 840 γ , 868 γ and 1033 γ are of E2 character.

& Negative-parity assignment from assumption 1/2⁻ level at 173 keV is analogous to β -decaying isomers in the ^{89}Tc and ^{87}Nb isotones.

^a Band(A): $\pi=+$ g.s. band.

^b Band(B): $\pi=-$ sequence. Based on presumed 1/2⁻ isomer.

${}^{54}\text{Fe}({}^{40}\text{Ca},\text{p}2\text{n}\gamma)$ **2005Ma55** (continued) $\gamma({}^{91}\text{Rh})$

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
290.6 2	7 3	2568.3		2277.7	(17/2 ⁻)		
305.2 [#] 2	4 2	2873.5		2568.3			
372.2 2	44 [‡] 16	2277.7	(17/2 ⁻)	1905.45	(13/2 ⁻)		
438.8 [#] 3	4 2	3312.3		2873.5			
447.2 1	84 4	3102.6	(25/2 ⁺)	2655.4	(21/2 ⁺)	Q	R _{ADO} =1.3 3.
500.0 [@] 2		1292.07	(9/2 ⁻)	792.1	(5/2 ⁻)		
613.4 2	35 [‡] 7	1905.45	(13/2 ⁻)	1292.07	(9/2 ⁻)		
619.2 [@] 2		792.1	(5/2 ⁻)	172.9	(1/2 ⁻)		
665.1 3	17 3	5883.6		5218.5			
836.5 2	22 [‡] 8	3114.2		2277.7	(17/2 ⁻)		
840.4 1	≥100	840.41	(13/2 ⁺)	0.0	(9/2 ⁺)	Q	R _{ADO} =1.29 27.
856.2 3	10 4	3133.9		2277.7	(17/2 ⁻)		
868.4 2	94 7	2655.4	(21/2 ⁺)	1787.01	(17/2 ⁺)	Q	R _{ADO} =1.4 3.
946.6 2	100 13	1787.01	(17/2 ⁺)	840.41	(13/2 ⁺)		
1033.3 3	39 5	4135.9	(29/2 ⁺)	3102.6	(25/2 ⁺)	Q	R _{ADO} =1.5 5.
1065.0 3	12 [‡] 4	1905.45	(13/2 ⁻)	840.41	(13/2 ⁺)		
1082.6 2	18 4	5218.5		4135.9	(29/2 ⁺)		
1136.0 4	11 3	7019.6		5883.6			
1292.1 3		1292.07	(9/2 ⁻)	0.0	(9/2 ⁺)		

[†] From angular distribution on oriented states, $R_{\text{ADO}}=I_\gamma(35^\circ \text{ or } 145^\circ)/I_\gamma(90^\circ)$; expected values are 1.3 and 0.7 for stretched Q and D, $\Delta J=1$ transitions, respectively.

[‡] Deduced from γ -gated spectra. For specific details, refer to discussion of [2005Ma55](#).

[#] Order of 439 γ -305 γ cascade is not established.

[@] Order of 500 γ -619 γ cascade is not established.

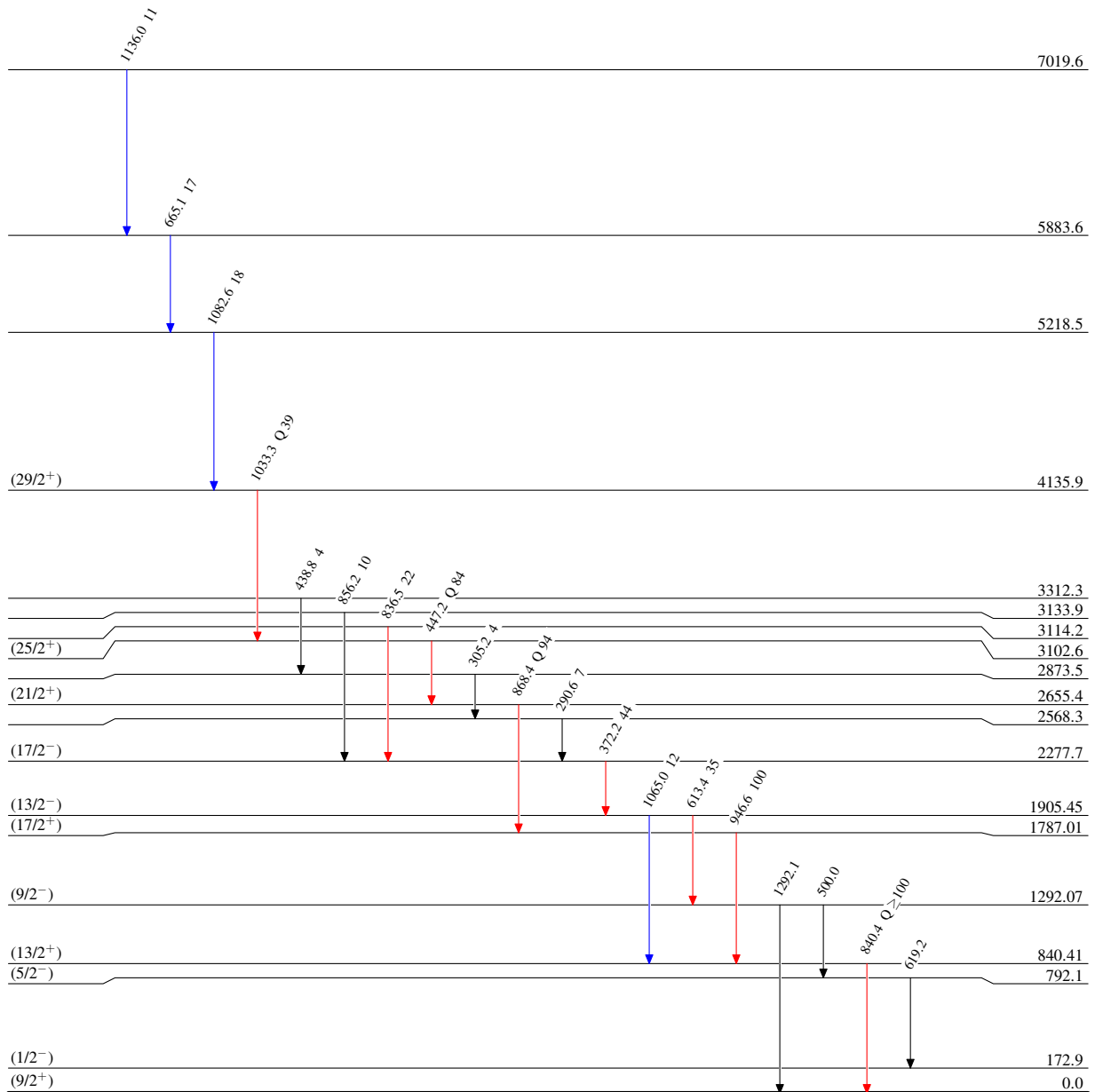
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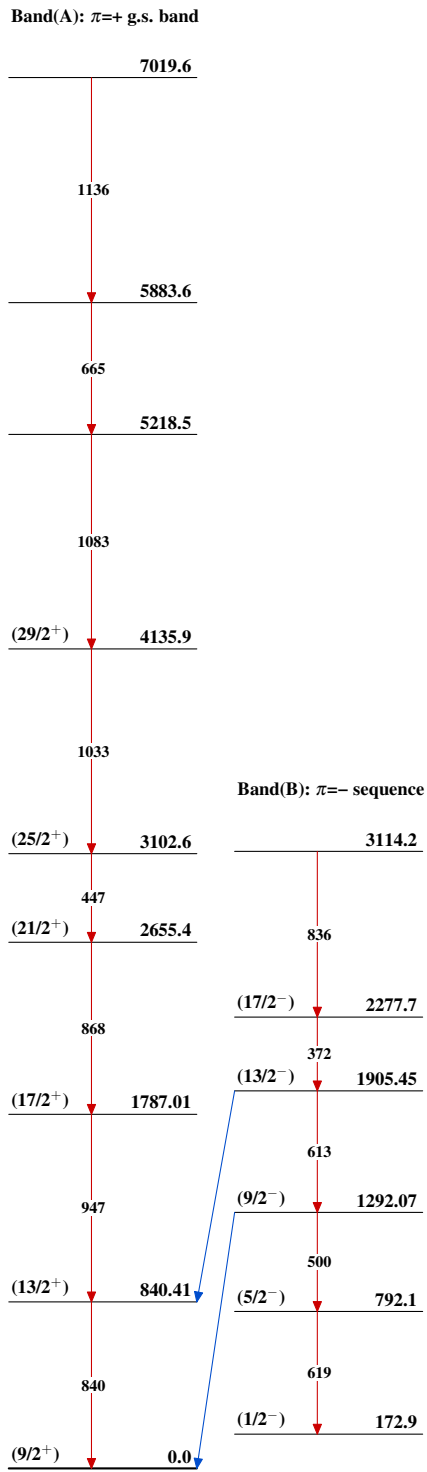
Level Scheme

Intensities: Relative I_γ

Legend

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

 ${}^{91}_{45}\text{Rh}_{46}$

${}^{54}\text{Fe}({}^{40}\text{Ca},\text{p}2\text{n}\gamma)$ 2005Ma55 ${}^{91}_{45}\text{Rh}_{46}$