

$^{54}\text{Fe}(\text{n},\gamma),(\text{pol n},\gamma)$ E=thermal 1972Ko15,1967Ar14,1990Ku26

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Huo Junde	NDS 109, 787 (2008)	30-Apr-2007

Additional information 1.

1990Ku26: enriched target (99.9%); HPGE (resolutions: 2 keV at 1332 keV of ^{60}Co) and NaI(Tl) (resolutions: 11% at 661 keV of ^{137}Cs), measured DSA.

1965Fi04: enriched target (78.1%); magnetic Compton γ spectrometer (resolution: 2%); measured $\sigma(\text{E}\gamma)$.

1966Ea04: Ge(Li) spectrometer; measured $\text{E}\gamma$.

1967Ar14: enriched target (97%); Ge(Li) spectrometers (resolutions: 5 keV/2 MeV, 7 keV/4 MeV, 11 keV/8 MeV); measured $\text{E}\gamma$, $\text{I}\gamma$.

1972Ko15: enriched target (93.04%); pol n; Ge(Li); measured $\text{E}\gamma$, $\text{I}\gamma$ circular polarization of γ ray.

See also **1964Co13** and **1967Gr23**.

Levels and decay scheme are mainly from **1965Fi04**.

 ^{55}Fe Levels

E(level)	$J^{\pi\dagger}$	$T_{1/2}^{\ddagger}$	Comments
0.0	$3/2^-$		
412.0 7	$1/2^-$		
931 2	$5/2^-$		
1315 3	$(7/2)^-$		
1918.1 12	$1/2^-$	12 fs 4	
2050.9 8	$3/2^-$	7.6 fs 21	
2470.4 7	$3/2^-$	15 fs 3	
2873 5			
3028.9 8	$3/2^-$	15 fs 8	
3285		8 fs 7	
3552.4 9	$(3/2^-)$	<3.5 fs	
3790.4 9	$1/2^-$	<11 fs	
3906.8 9	$(1/2,3/2)^-$	<3.5 fs	
4495.1 8	$1/2^-$	3.5 fs 21	
4708.3 8	$(1/2,3/2)$	4 fs 3	E(level): may be different from 4707 10 ($J^{\pi}:5/2^+$) level in (d,p), (pol d,p).
4867.2 21			
5119 3		6 fs 4	
9298.2 6	$1/2^+$		J^{π} : for s-wave capture.

$\dagger$ From **1972Ko15**, based on γ circular polarization function and L values from $^{54}\text{Fe}(\text{d,p})$.

$\ddagger$ From **1990Ku26**.

 $\gamma(^{55}\text{Fe})$

$\text{E}_{\gamma}^{\dagger}$	I_{γ}^b	$\text{E}_i(\text{level})$	J_i^{π}	E_f	J_f^{π}	$\text{E}_{\gamma}^{\dagger}$	I_{γ}^b	$\text{E}_i(\text{level})$	J_i^{π}	E_f	J_f^{π}
412 1	19 4	412.0	$1/2^-$	0.0	$3/2^-$	2470 1	3.9 19	2470.4	$3/2^-$	0.0	$3/2^-$
931 2	2.1 11	931	$5/2^-$	0.0	$3/2^-$	2618 2	2.4 12	3028.9	$3/2^-$	412.0	$1/2^-$
$^x1240^{\ddagger} 20$	$1.0^{\ddagger}$					$^x2670^{\ddagger} 20$	$1.5^{\ddagger}$				
1315 $^{\#} 3$	0.8 4	1315	$(7/2)^-$	0.0	$3/2^-$	2791 $^{\#} 5$	0.7 4	4708.3	$(1/2,3/2)$	1918.1	$1/2^-$
1506 2	0.7 4	1918.1	$1/2^-$	412.0	$1/2^-$	2873 $^c @ 5$	1.1 6	2873		0.0	$3/2^-$
1638 1	1.7 9	2050.9	$3/2^-$	412.0	$1/2^-$	2873 c		3285		412.0	$1/2^-$
1872 $^{\#} 2$	0.8 4	3790.4	$1/2^-$	1918.1	$1/2^-$	$^x3005 5$	1.0				
1918 2	2.1 11	1918.1	$1/2^-$	0.0	$3/2^-$	3028 2	2.6 13	3028.9	$3/2^-$	0.0	$3/2^-$
2052 $^c 3$	2.0 1	2050.9	$3/2^-$	0.0	$3/2^-$	$^x3040 5$	0.5				
2052 $^c 3$	2.0 1	2470.4	$3/2^-$	412.0	$1/2^-$	3380 $^{\ddagger} 20$	$1.5^{\ddagger} 7$	3790.4	$1/2^-$	412.0	$1/2^-$

Continued on next page (footnotes at end of table)

$^{54}\text{Fe}(\text{n},\gamma),(\text{pol n},\gamma) \text{ E=thermal}$ [1972Ko15](#),[1967Ar14](#),[1990Ku26](#) (continued) $\gamma(^{55}\text{Fe})$ (continued)

$E_\gamma^\dagger$	I_γ^b	$E_i(\text{level})$	J_i^π	E_f	J_f^π
$^{x3508.5}$	1.0				
3552 ^a 3	1.4 7	3552.4	(3/2 ⁻)	0.0	3/2 ⁻
3792 4	1.8 9	3790.4	1/2 ⁻	0.0	3/2 ⁻
3906 [@] 5	0.8 4	3906.8	(1/2,3/2) ⁻	0.0	3/2 ⁻
$^{x3960.5}$	0.5				
$^{x4012.5}$	0.3				
4180 [@] 5	0.8 4	9298.2	1/2 ⁺	5119	
4455 2	1.6 8	4867.2		412.0	1/2 ⁻
4495 3	3.4 17	4495.1	1/2 ⁻	0.0	3/2 ⁻
$^{x4535.5}$	0.5				
4589.6 5	2.6 3	9298.2	1/2 ⁺	4708.3	(1/2,3/2)
4707 ^d 3	<1.8 ^d	4708.3	(1/2,3/2)	0.0	3/2 ⁻
4707 ^d 3	<1.8 ^d	5119		412.0	1/2 ⁻
4802.8 5	2.9 3	9298.2	1/2 ⁺	4495.1	1/2 ⁻
5391.1 7	1.2 2	9298.2	1/2 ⁺	3906.8	(1/2,3/2) ⁻
5507.5 7	2.4 3	9298.2	1/2 ⁺	3790.4	1/2 ⁻
5745.4 7	2.3 2	9298.2	1/2 ⁺	3552.4	(3/2 ⁻)
6268.9 7	3.2 3	9298.2	1/2 ⁺	3028.9	3/2 ⁻
$^{x6617.5}$	0.7				
6826.8 7	1.9 2	9298.2	1/2 ⁺	2470.4	3/2 ⁻
7246.3 8	2.0 2	9298.2	1/2 ⁺	2050.9	3/2 ⁻
$^{x7363\&e} 5$	0.1				
$^{x7385\&e} 5$	0.1				
8886.4 9	12.3 13	9298.2	1/2 ⁺	412.0	1/2 ⁻
9297.8 10	66 4	9298.2	1/2 ⁺	0.0	3/2 ⁻

[†] Unplaced γ rays are from [1967Ar14](#), primary capture γ rays are mainly from [1972Ko15](#). Other γ rays are from [1966Ea04](#), except as noted.

[‡] From [1965Fi04](#).

Suggested placement by evaluator based on energy sums.

@ From [1967Ar14](#).

& May belong to background ([1967Ar14](#)).

^a Weighted average of values from [1966Ea04](#) and [1967Ar14](#).

^b Photons per 100 captures. Primary capture γ ray intensities are from [1972Ko15](#); the others are mainly from [1967Ar14](#), except as noted.

^c Multiply placed.

^d Multiply placed with undivided intensity.

^e Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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

