

$^{56}\text{Fe}(\mu^-, \nu 2n\gamma)$ 2006Me08

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde		NDS 121, 1 (2014)	20-Jun-2014

The μ^- beam obtained from decay of π^- beam at 90 MeV/c. Measured I_γ , $\gamma\gamma$, γ -p using two HPGe detectors at TRIUMF facility.

Muonic Lyman series for natural Iron

μ x ray	Energy	Intensity in percent	
2p-1s	1253.06 6	a	74.5 15
2p-1s	1257.19 5	a	
3p-1s	1522.3 3		7.5 4
4p-1s	1615.3 3		2.7 2
5p-1s	1658.2 3		1.6 2
6p-1s	1681.7 3		2.2 2
7p-1s	1695.7 3		2.0 2
8p-1s	1704.7 3		1.2 2
(9- ∞)p-1s	1708-1733		8.4 10

a: from 1976Ha24, used as calibration standard.

Muonic Balmer series for natural Iron

μ x ray	Energy	Intensity in percent	
3d-2p	265.3 3		28.8
3d-2p	268.9 3		16.6
4d-2p	358.0 3		5.4
4d-2p	362.0 3		3.1
5d-2p	400.6 3		5.9
5d-2p	404.6 3		
6d-2p	423.8 3		3.4
6d-2p	427.8 3		
7d-2p	437.8 3		3.5
7d-2p	442.5 3		
8d-2p	447.3 3		1.5
8d-2p	451.5 3		
(9- ∞)d-2p	455-475		5.9

 ^{54}Mn Levels

E(level) [†]	J π [†]	Yield [‡]	Comments
0.0	3 ⁺ #		
54.88 12	2 ⁺ #		known cascading=1.3% 6.
156.29 8	4 ⁺ #		known cascading=2.9% 5.
368.22 15	5 ⁺	0.5 8	known cascading=1.3% 8.
407.55 8	3 ⁺	1.8 5	
1009.7 3	3 ⁺	<0.8	
1073.11 20	6 ⁺	1.3 8	
1391.0 3	1 ⁺	0.9 5	
1454.4 3	1 ⁺	0.5 4	
1508.41 17	2 ⁺	2.8 10	

Continued on next page (footnotes at end of table)

$^{56}\text{Fe}(\mu^-, \nu 2n\gamma)$ 2006Me08 (continued) ^{54}Mn Levels (continued)[†] From Adopted Levels.[‡] Percent Yield of level per muon capture. Corrected for known cascading.

From Adopted Levels, but haven't listed by 2006Me08.

 $\gamma(^{54}\text{Mn})$

E_γ [†]	I_γ [‡]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
54.4 [#] 3		54.88	2 ⁺	0.0	3 ⁺	
156.27 [#] 11		156.29	4 ⁺	0.0	3 ⁺	
211.98 14	1.7 3	368.22	5 ⁺	156.29	4 ⁺	E_γ : transitions in ^{54}Mn and ^{56}Mn are too close to distinguish (2006Me08). I_γ : $\geq 70\%$ of γ -ray yield in ^{54}Mn due to known cascading from 1073 level (2006Me08).
251.2 1	1.0 3	407.55	3 ⁺	156.29	4 ⁺	
407.5 1	0.7 4	407.55	3 ⁺	0.0	3 ⁺	
704.88 17	1.2 7	1073.11	6 ⁺	368.22	5 ⁺	
853.1 5	<0.3	1009.7	3 ⁺	156.29	4 ⁺	
954.9 5	<0.4	1009.7	3 ⁺	54.88	2 ⁺	
1336.0 5	0.8 5	1391.0	1 ⁺	54.88	2 ⁺	
1399.6 6	0.4 3	1454.4	1 ⁺	54.88	2 ⁺	
1508.3 2	1.7 6	1508.41	2 ⁺	0.0	3 ⁺	

[†] From adopted gammas.[‡] Percent γ -ray yield.

From adopted gammas, but haven't listed by 2006Me08.

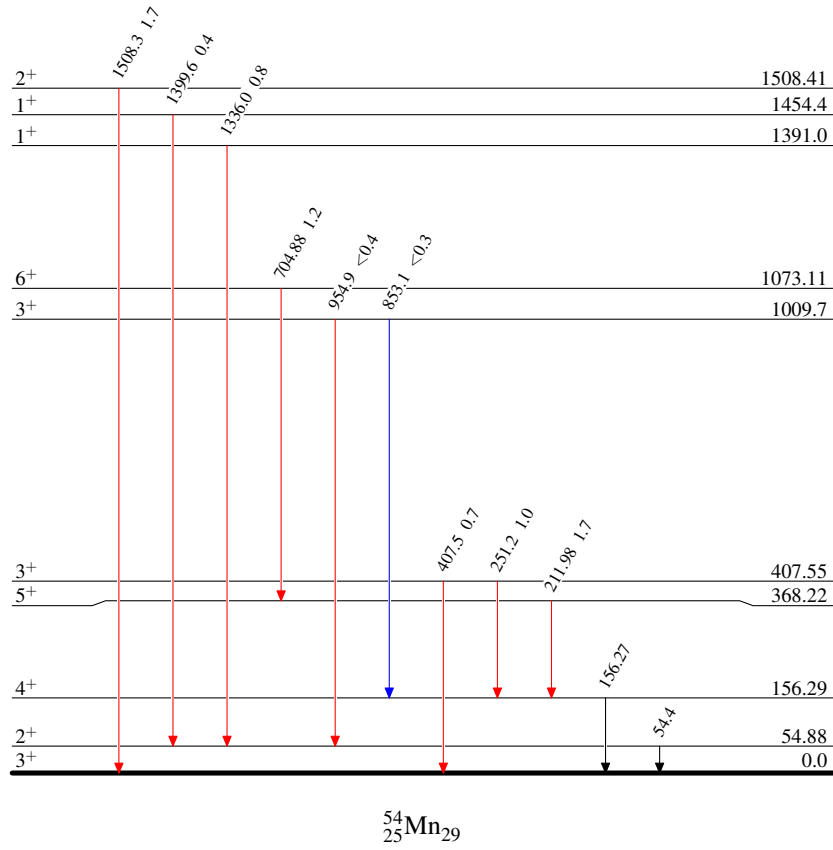
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Level Scheme

Intensities: Percent γ -ray yield per muon capture

Legend

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

 $^{54}_{25}\text{Mn}_{29}$