

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 179, 1 (2022)	30-Nov-2021

$Q(\beta^-) = -19740$  SY;  $S(n) = 18950$  SY;  $S(p) = 2.73 \times 10^3$  10;  $Q(\alpha) = -7.01 \times 10^3$  11 [2021Wa16](#)

$\Delta Q(\beta^-) = 510$ ,  $\Delta S(n) = 510$  (syst, [2021Wa16](#)).

$S(2n) = 35360$  310 (syst),  $S(2p) = 3110$  90,  $Q(\varepsilon) = 11290$  90,  $Q(\varepsilon p) = 9270$  90 ([2021Wa16](#)).

Mass measurement:

[2020Fu05](#): measured mass excess = -18009 keV 92 at the HIRFL-CSR acceleration complex at Lanzhou, using the isochronous mass spectrometry (IMS) with the experimental cooler storage ring (CSRe).

Other measurements:

[2016Or03](#):  $^{48}\text{Fe}$  was produced in fragmentation of 74.5 MeV/nucleon  $^{58}\text{Ni}$  beam on a 200  $\mu\text{m}$  thick natural Ni target at LISE3-GANIL facility. Fragments were selected by LISE3 separator and implanted into a double-sided silicon strip detector (DSSSD), surrounded by four EXOGAM Ge clovers for  $\gamma$  ray detection. Implantations were identified by energy loss  $\Delta E$  and time-of-flight (tof) information. Measured  $E_p$ ,  $I_p$ ,  $^{48}\text{Fe}$  half-life, delayed proton decay branches.

[1996Fa09](#):  $^9\text{Be}(^{58}\text{Ni}, X)$   $E = 650$  MeV/nucleon. Measured projectile-like fragments at  $0^\circ$ , fragment recoil separator; mag spect,  $\Delta E/E$  counter telescope (Si), tof).

Others: [2016BI05](#), [2002Pf03](#), [1994BI10](#), [1993Bu04](#), [1987Po04](#).

Consult Nuclear Science References for theoretical studies.

Level scheme is tentatively proposed by [2021Ya33](#) based on comparisons with that of the mirror nucleus  $^{48}\text{Ti}$ .

 $^{48}\text{Fe}$  LevelsCross Reference (XREF) Flags

A  $^{49}\text{Ni}$   $\varepsilon p$  decay  
B  $^9\text{Be}(^{49}\text{Fe}, X\gamma)$

E(level) <sup>†</sup>	J $\pi$ <sup>‡</sup>	T <sub>1/2</sub>	XREF	Comments
0.0	0 <sup>+</sup>	45.5 ms 8	AB	$\% \varepsilon + \% \beta^+ = 100$ ; $\% \varepsilon p = 15.3$ 8 T <sub>1/2</sub> : weighted average of 51 ms 3 ( <a href="#">2016Or03</a> ), 45.3 ms 6 ( <a href="#">2007Do17</a> ), 44 ms 7 ( <a href="#">1996Fa09</a> ). $\% \varepsilon p$ : weighted average of 14.4 7 ( <a href="#">2016Or03</a> ) and 15.9 6 ( <a href="#">2007Do17</a> ). Other: >3.6 11 for $E(p) = 959$ keV 33 ( <a href="#">1996Fa09</a> ).
969.5 5	(2 <sup>+</sup> )		AB	
2253.5? 11	(4 <sup>+</sup> )		B	
2377? 3	(2 <sup>+</sup> )		B	
3197.5? 23	(4 <sup>+</sup> )		B	
3241.5? 21	(6 <sup>+</sup> )		B	
3475? 5	(3 <sup>-</sup> )		B	
3497.5? 20	(6 <sup>+</sup> )		B	
4205? 4	(5 <sup>-</sup> )		B	

<sup>†</sup> From a least-squares fit to  $\gamma$ -ray energies.

<sup>‡</sup> Proposed in [2021Ya33](#) in  $(^{49}\text{Fe}, X\gamma)$  based on comparisons with mirror nucleus  $^{48}\text{Ti}$  and shell-model predictions.

**Adopted Levels, Gammas (continued)**

<u><math>\gamma(^{48}\text{Fe})</math></u>						
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Comments
969.5	(2 <sup>+</sup> )	969.5	5	100	0.0	0 <sup>+</sup>
2253.5?	(4 <sup>+</sup> )	1284	1	100	969.5	(2 <sup>+</sup> )
2377?	(2 <sup>+</sup> )	1407	3	100	969.5	(2 <sup>+</sup> )
3197.5?	(4 <sup>+</sup> )	944 <sup>‡</sup>	2	100	2253.5?	(4 <sup>+</sup> )
3241.5?	(6 <sup>+</sup> )	988	3	100	2253.5?	(4 <sup>+</sup> )
3475?	(3 <sup>-</sup> )	2505	5	100	969.5	(2 <sup>+</sup> )
3497.5?	(6 <sup>+</sup> )	256	1	100	3241.5?	(6 <sup>+</sup> )
		1244	2	79	2253.5?	(4 <sup>+</sup> )
4205?	(5 <sup>-</sup> )	1951 <sup>‡</sup>	4	100	2253.5?	(4 <sup>+</sup> )

E<sub>γ</sub>: from [2007Do17](#). Other: 971 *I* from (<sup>49</sup>Fe,Xγ) ([2021Ya33](#)).

<sup>†</sup> From <sup>49</sup>Fe,Xγ) ([2021Ya33](#)), unless otherwise noted.

<sup>‡</sup> Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

----->  $\gamma$  Decay (Uncertain)

