

${}^9\text{Be}({}^{49}\text{Fe}, X\gamma)$ 2021Ya33

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

2021Ya33: E=80 MeV/nucleon ${}^{49}\text{Fe}$ secondary beam was produced by fragmentation of ≈ 160 MeV/nucleon ${}^{58}\text{Ni}$ primary beam from the K500/K1200 cyclotrons on a 802 mg/cm^2 ${}^9\text{Be}$ production target at NSCL. Fragments were identified and separated with the A1900 fragment separator. Reaction target was 188 mg/cm^2 ${}^9\text{Be}$. γ rays were detected with the GRETINA tracking array of 9 detector modules with each consisting of 4 HPGe crystals; reaction products were identified with the S800 spectrograph according to time-of-flight and energy loss. Measured E_γ , I_γ , particle- γ -coin, $\gamma\gamma$ -coin, cross sections. Deduced levels, J, π . Comparisons with shell model calculations.

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

 ${}^{48}\text{Fe}$ Levels

Total inclusive cross section=8 mb 2. The exclusive cross section for each level is listed under comments.

E(level) [†]	J π [‡]	Comments
0.0	0 ⁺	$\sigma=3$ mb 2.
971.0? 10	(2 ⁺)	$\sigma=0.9$ mb 9.
2255.0? 14	(4 ⁺)	$\sigma=1.1$ mb 8.
2378? 3	(2 ⁺)	$\sigma=0.4$ mb 2.
3199.0? 25	(4 ⁺)	$\sigma=0.5$ mb 4.
3243.0? 23	(6 ⁺)	$\sigma=0.1$ mb 6.
3476? 5	(3 ⁻)	$\sigma=0.4$ mb 2.
3499.0? 22	(6 ⁺)	$\sigma=1.9$ mb 4.
4206? 4	(5 ⁻)	$\sigma=0.3$ mb 2.

[†] From a least-squares fit to γ -ray energies.

[‡] Proposed in **2021Ya33** based on comparisons with mirror nucleus ${}^{48}\text{Ti}$ and shell-model predictions.

 $\gamma({}^{48}\text{Fe})$

E_γ [†]	I_γ [‡]	$E_i(\text{level})$	J_i^π	E_f	J_f^π
256 1	19 3	3499.0?	(6 ⁺)	3243.0?	(6 ⁺)
944# 2	8 6	3199.0?	(4 ⁺)	2255.0?	(4 ⁺)
971 1	100 14	971.0?	(2 ⁺)	0.0	0 ⁺
988 3	21 11	3243.0?	(6 ⁺)	2255.0?	(4 ⁺)
1244 2	15 3	3499.0?	(6 ⁺)	2255.0?	(4 ⁺)
1284 1	69 5	2255.0?	(4 ⁺)	971.0?	(2 ⁺)
1407 3	7 3	2378?	(2 ⁺)	971.0?	(2 ⁺)
1951# 4	6 3	4206?	(5 ⁻)	2255.0?	(4 ⁺)
2505 5	7 3	3476?	(3 ⁻)	971.0?	(2 ⁺)

[†] From **2021Ya33**.

[‡] Not available in **2021Ya33**; quoted values are from an email reply of the first author R. Yajzey to the evaluator (J. Chen) on December, 9, 2021.

Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme
 Intensities: Relative I_γ

- \longrightarrow $I_\gamma < 2\% \times I_\gamma^{\max}$
- \longrightarrow $I_\gamma < 10\% \times I_\gamma^{\max}$
- \longrightarrow $I_\gamma > 10\% \times I_\gamma^{\max}$
- \dashrightarrow γ Decay (Uncertain)

