

⁵⁴Fe(α ,n), (α ,n γ), (⁶Li,t)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. R. Bhat	NDS 85, 415 (1998)	24-Sep-1998

1970Go18,1972Go02: E α =8.7, 9.2, 10.5 MeV. Measured γ 's, n's, and n γ -coincidences (Ge(Li),scin). T_{1/2} by DSAM (centroid).
 1971Be33: E α =7– 11 MeV. Measured γ 's, excitation functions, n γ -coincidences and γ (0°,30°,45°,60°,90°) (Ge(Li),scin). T_{1/2} by DSAM (centroid).
 1974Pi03: E α = 9 MeV. Measured γ 's (Ge(Li)). T_{1/2} by DSAM.
 1978Wo01: E(⁶Li)= 34 MeV. Measured σ (θ ,E). Obtained partial σ 's for E(level)< 4 MeV.
 1980MoZR: E α =18– 27 MeV. Measured $\gamma\gamma$ -coincidences, $\gamma\gamma$ (θ), and excitation functions. No details given.
 1989Sa47: E α =18– 27 MeV; measured E γ , I γ , γ (θ), γ excitation functions, T_{1/2} by DSAM and $\gamma\gamma$ coincidences.
 Others: 1974Hi06 and 1974Vi01.

⁵⁷Ni Levels

E(level) [†]	J π [‡]	T _{1/2}	Comments
0.0	3/2 ⁻		
768.5 5	5/2 ⁻	3.2 ps 4	T _{1/2} : from 1974Pi03. Others: > 1.4 ps, < 5.5 ps (1970Go18), and > 2.0 ps (1971Be33).
1112.6 5	1/2 ⁻	106 fs 23	T _{1/2} : unweighted av of 152 fs 28 (1971Be33), 90 fs 21 (1970Go18), and 76 fs 14 (1974Pi03).
2443.1 5	5/2 ⁻	31 fs 5	J π : 5/2 from γ (θ) (1972Go02). T _{1/2} : weighted av of 33 fs 6 (1971Be33) and 28 fs 7 (1970Go18).
2577.5# 5	7/2 ⁻	47 fs 6	J π : 7/2 from γ (θ) and excitation function (1989Sa47); π =- from E2 to 3/2 ⁻ . T _{1/2} : weighted av of 54 fs 9 (1971Be33) and 42 fs 7 (1970Go18). Other: 90 fs 50 (1989Sa47).
3007 1	3/2 ⁻	12 fs 4	J π : 3/2,5/2 from γ (θ) (1971Be33); (5/2,7/2) from γ (θ) and excitation function (1989Sa47). T _{1/2} : unweighted av of 15 fs 8 (1971Be33) and 8 fs 4 (1972Go02). Other: 110 fs 30 (1989Sa47).
3.71×10 ³ @	(5/2) ⁻		The 3.71- and 3.85-MeV states are the most strongly populated in (⁶ Li,t); see 1978Wo01 for a discussion of these levels. No J π assignment to this level by 1978Wo01.
3.85×10 ³ @	3/2 ⁻		J π : (3/2,5/2) proposed on the basis of the strong population of this level in (⁶ Li,t) and the weak population in neutron pickup (1978Wo01).
3864#&	11/2 ⁻	0.29 ps 10	T _{1/2} : from 1989Sa47; a comparison of these authors' T _{1/2} (3007) with the adopted value suggests that a side-feeding lifetime larger than that assumed by the authors is required. J π : 11/2 from γ (θ) and excitation function (1989Sa47); π =- from E2 to 7/2 ⁻ .
5318#&	15/2 ⁻	0.64 ps 17	T _{1/2} : from 1989Sa47; see the comment on the 3864 level. J π : 15/2 from γ (θ) and excitation function (1989Sa47); π =- from E2 to 11/2 ⁻ .

[†] From 1971Be33, except as noted.

[‡] From Adopted Levels; supporting arguments from this data set are indicated.

Band(A); Yrast band. Proposed by 1989Sa47 and 1980MoZR.

@ From 14° spectrum of 1978Wo01.

& From 1989Sa47.

$^{54}\text{Fe}(\alpha, n), (\alpha, n\gamma), ({}^6\text{Li}, t)$ (continued) $\gamma(^{57}\text{Ni})$

All data from [1971Be33](#), except as noted. $\gamma\gamma$ coincidences have been measured by [1980MoZR](#).

$E_i(\text{level})$	J_i^π	E_γ	I_γ^\dagger	E_f	J_f^π	Mult. [‡]	δ	Comments
768.5	$5/2^-$	768.5 5	100	0.0	$3/2^-$	(M1),E2		
1112.6	$1/2^-$	1112.6 5	100	0.0	$3/2^-$	(M1),E2		
2443.1	$5/2^-$	1674.6 5	<5	768.5	$5/2^-$			E_γ : transition not observed.
		2443.1 5	100	0.0	$3/2^-$	M1(+E2)	<+0.8	
2577.5	$7/2^-$	1809 [@]	<10	768.5	$5/2^-$			
		2577.5 5	100	0.0	$3/2^-$	E2		Mult.: Q from $\gamma(\theta)$ (1989Sa47); E2 from RUL.
3007	$3/2^-$	3007 1	100	0.0	$3/2^-$	D,E2		
3864	$11/2^-$	1287 [#]		2577.5	$7/2^-$	E2		Mult.: Q from $\gamma(\theta)$ (1989Sa47); E2 from RUL.
5318	$15/2^-$	1454 [#]		3864	$11/2^-$	E2		Mult.: Q from $\gamma(\theta)$ (1989Sa47); E2 from RUL.

[†] Relative photon branching from each level.

[‡] From $T_{1/2}$ and $\gamma(\theta)$ considerations and adopted J^π 's, except as noted.

[#] From [1989Sa47](#).

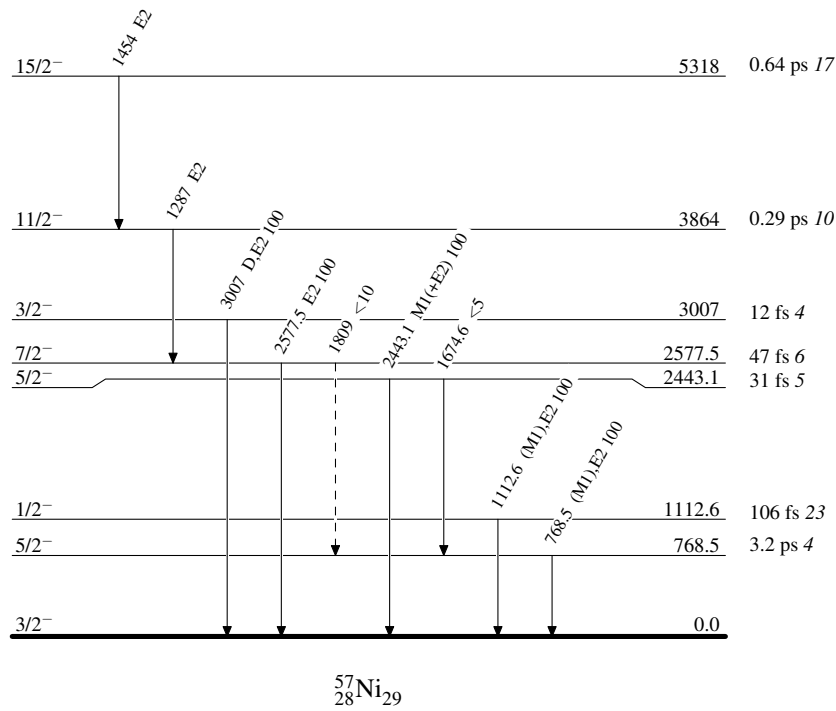
[@] Placement of transition in the level scheme is uncertain.

$^{54}\text{Fe}(\alpha, n), (\alpha, n\gamma), (^6\text{Li}, t)$

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

$^{54}\text{Fe}(\alpha, n), (\alpha, n\gamma), ({}^6\text{Li}, t)$

Band(A): Yrast band

15/2⁻ 5318

1454

11/2⁻ 3864

1287

7/2⁻ 2577.5 $^{57}_{28}\text{Ni}_{29}$