

Adopted Levels, Gammas

Type	Author	History	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	Citation	10-Jul-2015
Q(β ⁻)=-14340 syst; S(n)=16201 11; S(p)=7378 7; Q(α)=-7936 10		2012Wa38	
DQ-			

⁵²Fe Levels

Ispin and analog state assignments taken from ⁵⁴Fe(p,t) and ⁵⁰Cr(³He,n). Analogs identified in both reactions are given.

Cross Reference (XREF) Flags

A ⁵³ Co p decay (247 ms)	E ⁵⁴ Fe(p,t)	I ⁹ Be(⁵⁵ Ni,Xγ)
B ⁵⁰ Cr(³ He,n)	F ⁵² Co ε decay	J Coulomb excitation
C ⁵⁰ Cr(³ He,nγ)	G ⁵³ Ni εp decay	
D ⁵⁰ Cr(α,2nγ)	H ²⁸ Si(²⁸ Si,2p2nγ)	

E(level) [†]	J ^{π‡}	T _{1/2} [#]	XREF	Comments
0.0 ^{&}	0 ⁺	8.275 h 8	ABCDEF HIJ	%ε+%β ⁺ =100 T _{1/2} : from 1974Ro18. Others: 8.23 h 4 (1967Pa22). T _{1/2} : stripped atom T _{1/2} (⁵² Fe ²⁶⁺)=12.5 h +15-12 (1995Ir01).
849.45 ^{&} 10	2 ⁺	7.8 ps 10	ABCDEFGH IJ	B(E2)↑=0.082 10 (2004Yu07) XREF: B(840). T _{1/2} : from B(E2) (Coulomb excitation). Other: >0.7 ps DSAM ⁵⁰ Cr(³ He,nγ). J ^π : from L(³ He,n)=L(p,t)=2.
2384.55 ^{&} 17	4 ⁺	0.22 ps 5	BCDEF H	XREF: B(2360). T _{1/2} : other: 0.28 ps +14-21 DSAM ⁵⁰ Cr(³ He,nγ). J ^π : from L(³ He,n)=L(p,t)=4.
2758.8 7	2 ⁺	0.14 ps +9-5	BC E	XREF: B(2750)E(2762). J ^π : L(³ He,n)=2.
3585.0 ^a 3	4 ⁺	0.28 [@] ps +21-7	BC E H	T _{1/2} : From DSAM in ⁵⁰ Cr(³ He,nγ). XREF: B(3590)E(3583). J ^π : from L(³ He,n)=L(p,t)=4.
4145.6 20	0 ⁺		BC E	XREF: B(4160)E(4142). J ^π : from L(³ He,n)=L(p,t)=0.
4325.5 ^{&} 3 4396.3 3	6 ⁺ 3 ⁻	0.17 ps 5	C EF H C E H	J ^π : from E2 γ from 8 ⁺ and 1941 γ to 4 ⁺ . XREF: E(4400). J ^π : from E2 γ from 5 ⁻ and 3546γ to 2 ⁺ .
4456 8	2 ⁺		B E	XREF: B(4430). J ^π : from L(³ He,n)=L(p,t)=2.
4850.6 11	(5 ⁻ ,6 ⁺)	0.5 [@] ps +23-2	C E	XREF: E(4869). J ^π : from L(p,t)=(5,6).
4872.2 ^a 3 4896 15 5136.9 4	6 ⁺ 5 ⁻	0.21 ps 8	H E e H	J ^π : from E2 γ to 4 ⁺ . XREF: e(5134). J ^π : from L(p,t)=5.
5139.6 13	5 ⁻		C e	XREF: e(5134). J ^π : from L(p,t)=5.
5328 8 5363 5	4 ⁺ 0 ⁺		E B E	J ^π : From L(p,t)=4. XREF: B(5360).

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Adopted Levels, Gammas (continued)

^{52}Fe Levels (continued)					
E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments	
5439 15			E	J ^π : From L(³ He,n)=L(p,t)=0.	
5483 20	4 ⁺		E		
5529 20	4 ⁺		E		
5563 8	(3 ⁻)		E		
5654.5 4	6 ⁺		EF	T=1	
5718 8	0 ⁺		b E	IAS (⁵² Mn g.s.). XREF: b(5760). J ^π : L(³ He,n)=0.	
5792 10			b E	XREF: b(5760).	
5829 5	2 ⁺		B E	XREF: B(5820). J ^π : from L(³ He,n)=L(p,t)=2.	
5965 15	4 ⁺		E		
6034 5	2 ⁺		b E	T=1 XREF: b(6070).	
6044 5	2 ⁺		b E	IAS (⁵² Mn 378 keV)? see ⁵⁴ Fe(p,t). T=1 XREF: b(6070). IAS (⁵² Mn 378 keV)? see ⁵⁴ Fe(p,t).	
6174 15	(6 ⁺)		E		
6231 15			E		
6360.7 ^{&} 4	8 ⁺	0.15 ps 5	H	T _{1/2} : 1998Ur05 determined the lifetime of this level from the best fit of the experimental spectrum with that obtained after summing the calculated line shape of the 2035 γ-ray and the experimental line shape of the 2045 contaminant line from ⁴⁹ Cr. J ^π : from E2 γ to 6 ⁺ .	
6416 5	4 ⁺		E	T=1 IAS (⁵² Mn 732 keV)? see ⁵⁴ Fe(p,t).	
6454 15			E		
6483 5	2 ⁺		E		
6493.1 ^a 4	8 ⁺	0.18 ps 4	H	J ^π : from E2 γ to 6 ⁺ .	
6531 10	3 ⁻		B E	XREF: B(6520). J ^π : L(³ He,n)=3.	
6564 8			E		
6634 10	(0 ⁺)		E		
6714 8	2 ⁺		B E	XREF: B(6700). J ^π : L(³ He,n)=2.	
6744 15			E		
6772 8	(2 ⁺)		E		
6882 5	1 ⁻		E		
6927 15	0 ⁺		E		
6958.0 4	12 ⁺	45.9 s 6	H	%ε+%β ⁺ =100; %IT=0.021 5 (2005Da20) E(level): from 2005Ga20 ; others: 6957.3 keV 5 (2003Ax01,2004Ur02) and 6820 keV 130 (1998Ur05). T _{1/2} : from 1979Ge02 . Additional information 1. J ^π : from E4 γ to 8 ⁺ .	
7013 5	3 ⁻		E		
7124 10	(4 ⁺)		B E	XREF: B(7120).	
7261 15	(6 ⁺)		b E	XREF: b(7280).	
7289 8			b E	XREF: b(7280).	
7338 10			b E	XREF: b(7280).	
7381.9 ^{&} 4	(10 ⁺)		H	J ^π : from (E2) γ to 8 ⁺ .	
7463 8	2 ⁺		B E	XREF: B(7470).	

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Adopted Levels, Gammas (continued) ^{52}Fe Levels (continued)

<u>E(level)[†]</u>	<u>J^{π‡}</u>	<u>XREF</u>	<u>Comments</u>
7510 15		E	J ^π : from L($^3\text{He},n$)=L(p,t)=2.
7611 10	6 ⁺	b E	T=1 XREF: b(7640).
7636 15	4 ⁺	b E	T=1 XREF: b(7640).
7787 10		b E	XREF: b(7820).
7817 15		b E	XREF: b(7820).
7935 10	2 ⁺	E	
8037 12	0 ⁺	B E	T=1 XREF: B(8050). J ^π : from L($^3\text{He},n$)=L(p,t)=0. IAS (^{52}Mn 2474 keV) in $^{50}\text{Cr}(^3\text{He},n)$.
8067 8		E	
8097 10		E	
8122 15		E	
8146 10	3 ⁻	E	
8184 10		E	
8207 8	(3 ⁻)	E	
8240 10		E	
8327 10	(3 ⁻)	E	
8354 5	2 ⁺	B E	XREF: B(8360). IAS (^{52}Mn 2796 keV) in $^{50}\text{Cr}(^3\text{He},n)$ and $^{54}\text{Fe}(p,t)$. J ^π : from L($^3\text{He},n$)=L(p,t)=2. T=(1).
8401 8	2 ⁺	E	
8425 15		E	
8461 10		E	
8511 8	4 ⁺	E	
8535 5	4 ⁺	E	
8561 5	0 ⁺	B E	T= 2 XREF: B(8570). A doublet with energy splitting of 4 keV in (p,t). IAS (^{52}Cr g.s., ^{52}Mn 2926 keV) in $^{54}\text{Fe}(p,t)$ and $^{50}\text{Cr}(^3\text{He},n)$. J ^π : from L($^3\text{He},n$)=L(p,t)=0.
8618 8		E	
8661 15	(4 ⁺)	E	
8677 10		E	
8727 15		E	
8748 10	4 ⁺	E	T=(1).
8770 10	(3 ⁻)	E	
8832 10		E	
8872 10		E	
8900 8	(2 ⁺)	E	
8936 10		E	
8962 10	(6 ⁺)	E	
8985 10		b E	XREF: b(9010).
9044 15		b E	XREF: b(9010).
9059 15		E	
9130 50		B	
9213 8		b E	XREF: b(9250).
9279 8	4 ⁺	b E	XREF: b(9250).
9311 8		E	
9338 10		E	
9357 15		E	

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Adopted Levels, Gammas (continued)

^{52}Fe Levels (continued)

E(level) [†]	J ^π [‡]	XREF	Comments
9458 10		b E	XREF: b(9470).
9497 8		b E	XREF: b(9470).
9770 50		B	
10006 5	(2 ⁺)	B E	XREF: B(10060). IAS (^{52}Mn 4390 keV) in $^{54}\text{Fe}(p,t)$ and $^{50}\text{Cr}(^3\text{He},n)$. T=(2).
10049 10		E	
10332 5	0 ⁺	B E	XREF: B(10310). J ^π : from L($^3\text{He},n$)=L(p,t)=0.
10810 50		B	
10990 20	0 ⁺	B	T=2 J ^π : L($^3\text{He},n$)=0. IAS (^{52}Cr 2647 keV, ^{52}Mn 5491 keV) in $^{50}\text{Cr}(^3\text{He},n)$.
11440 50		B	
11640 50		B	
11780 30	2 ⁺	B	T=2 J ^π : L($^3\text{He},n$)=2. IAS (^{52}Cr 3162 keV) in $^{50}\text{Cr}(^3\text{He},n)$.

[†] Levels connected by gammas are from least squares fit, others from $^{54}\text{Fe}(p,t)$, except where seen only in ($^3\text{He},n$).

[‡] From L value in $^{54}\text{Fe}(p,t)$, with S=0 neutron pair transfer assumed, except as noted.

DSAM, from $^{28}\text{Si}(^{28}\text{Si},2p2n\gamma)$, except as noted.

@ DSAM, from $^{50}\text{Cr}(^3\text{He},n\gamma)$.

& Band(A): g.s. band.

^a Band(B): 4⁺ band (2004Ur02).

$\gamma(^{52}\text{Fe})$

E _i (level)	J _i ^π	E _γ [†]	I _γ [†]	E _f	J _f ^π	Mult. [@]	α ^a	Comments
849.45	2 ⁺	849.43 [#] 10	100	0.0	0 ⁺	[E2]		B(E2)(W.u.)=14.2 19
2384.55	4 ⁺	1535.27 [#] 15	100	849.45	2 ⁺	E2		B(E2)(W.u.)=26 6
2758.8	2 ⁺	1910 2	32 11	849.45	2 ⁺	[E2]		B(E2)(W.u.)=3.3 +17-25
		2760 1	100 11	0.0	0 ⁺	[E2]		B(E2)(W.u.)=1.7 +7-11
3585.0	4 ⁺	2735.0 [‡] 3	100 [‡] 11	849.45	2 ⁺	[E2]		B(E2)(W.u.)=1.1 +3-9
4145.6	0 ⁺	3296 2	100	849.45	2 ⁺			
4325.5	6 ⁺	1941.0 [‡] 3	100 [‡]	2384.55	4 ⁺	(E2) ^{&}		B(E2)(W.u.)=10 3
4396.3	3 ⁻	3546.3 [‡] 3	100 [‡]	849.45	2 ⁺	(E1) ^{&}		
4850.6	(5 ⁻ ,6 ⁺)	2466 1	100	2384.55	4 ⁺			
4872.2	6 ⁺	1286.7 [‡] 3	23 [‡] 5	3585.0	4 ⁺	[E2]		B(E2)(W.u.)=12 6
		2488.0 [‡] 3	100 [‡] 7	2384.55	4 ⁺	E2		B(E2)(W.u.)=2.0 8
5136.9	5 ⁻	740.6 [‡] 3	55 [‡] 6	4396.3	3 ⁻	(E2) ^{&}	0.00043	α(K)=0.00038 1
		1553 [‡] 1	10 [‡] 5	3585.0	4 ⁺	[E1]		E _γ : Uncertainty assigned to transition by evaluators.
		2753.0 [‡] 3	100 [‡] 20	2384.55	4 ⁺	[E1]		I _γ : Intensity of transition has been corrected for the angular distribution by 1998Ur05, as specified in literature.
5139.6	5 ⁻	2380 1	40 20	2758.8	2 ⁺	[E3]		
		4286 4	10×10 ¹ 4	849.45	2 ⁺	[E3]		
5654.5	6 ⁺	1328.95 [#] 25	100	4325.5	6 ⁺			

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Adopted Levels, Gammas (continued)

$\gamma(^{52}\text{Fe})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult. @	α^a	Comments
6360.7	8 ⁺	2035.3 [‡] 3	100 [‡]	4325.5	6 ⁺	E2		B(E2)(W.u.)=9 4
6493.1	8 ⁺	1620.8 [‡] 3	68 [‡] 14	4872.2	6 ⁺	[E2]		B(E2)(W.u.)=10 4
		2167.6 [‡] 3	100 [‡] 10	4325.5	6 ⁺	E2		B(E2)(W.u.)=3.4 9
6958.0	12 ⁺	465.0 [‡] 3	75 [‡] 25	6493.1	8 ⁺	E4	0.0167	$\alpha(\text{K})=0.0146$ 5; $\alpha(\text{L})=0.00157$ 5 B(E4)(W.u.)=0.0033 16 Additional information 2. Mult.: From experimental E4 systematics for f7/2-shell nuclei see $^{28}\text{Si}(^{28}\text{Si},2\text{p}2\text{n}\gamma)$ (2005Ga20).
		597.1 [‡] 3	100 [‡] 33	6360.7	8 ⁺	E4	0.0057	$\alpha(\text{K})=0.00497$ 15; $\alpha(\text{L})=0.00052$ 2 B(E4)(W.u.)=0.00046 22 Additional information 3. Mult.: From experimental E4 systematics for f7/2-shell nuclei see $^{28}\text{Si}(^{28}\text{Si},2\text{p}2\text{n}\gamma)$ (2005Ga20).
7381.9	(10 ⁺)	888.5 [‡] 3	88 [‡] 6	6493.1	8 ⁺	(E2)		
		1021.4 [‡] 3	100 [‡] 19	6360.7	8 ⁺	[E2]		

[†] From $^{50}\text{Cr}(^3\text{He},\text{n}\gamma)$, except as noted.

[‡] From $^{28}\text{Si}(^{28}\text{Si},2\text{p}2\text{n}\gamma)$.

From ^{52}Co ε decay.

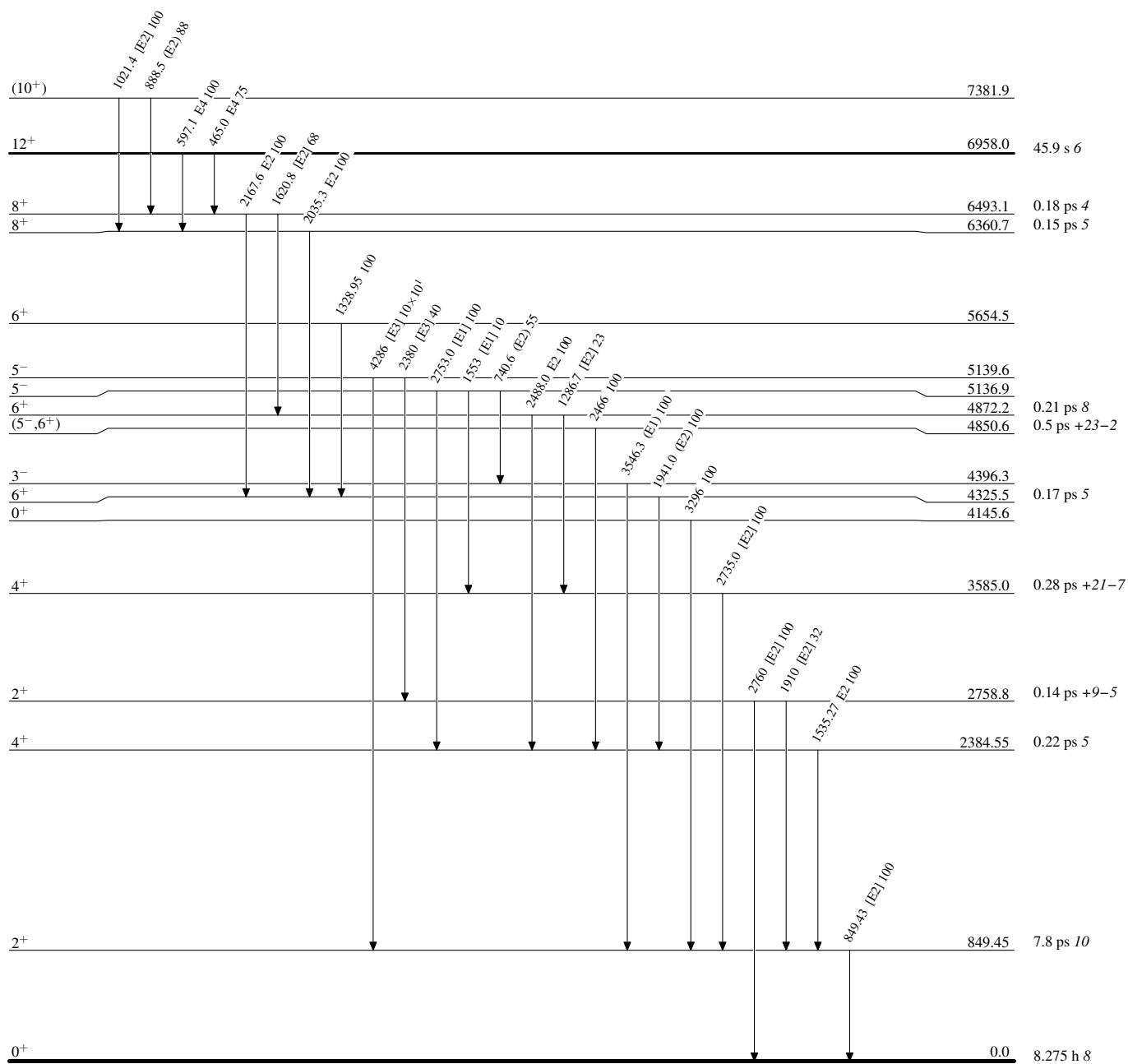
@ From values of R(ado) in $^{28}\text{Si}(^{28}\text{Si},2\text{p}2\text{n}\gamma)$ and using RULER to rule out mults, except as noted.

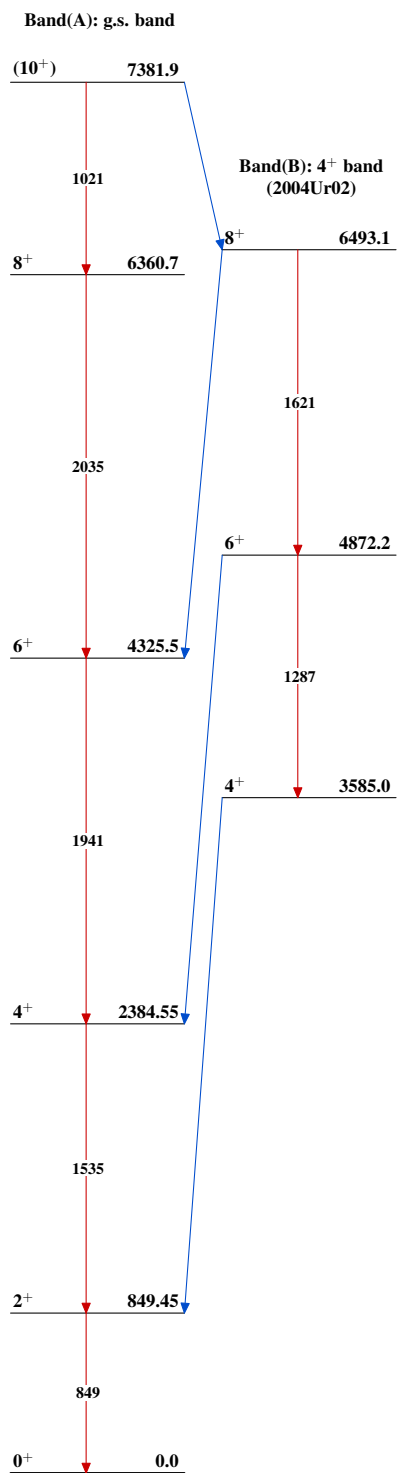
& From values of R(ado) in $^{28}\text{Si}(^{28}\text{Si},2\text{p}2\text{n}\gamma)$ and ΔJ^π from Adopted Levels.

^a Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas**Level Scheme**

Intensities: Relative photon branching from each level

 $^{52}_{26}\text{Fe}_{26}$

Adopted Levels, Gammas $^{52}_{26}\text{Fe}_{26}$