^{54}Fe(^{29}Si,n2pγ) 1987Da05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 105, 223 (2005)	22-Jun-2005

Includes following reactions:
^{51}V(^{32}S,p2nγ); ^{52}Cr(^{34}S,α2nγ); ^{54}Fe(^{28}Si,2pγ); ^{54}Fe(^{32}S,α2pγ); ^{56}Fe(^{28}Si,2p2nγ); ^{58}Ni(^{24}Mg,2pγ); ^{66}Zn(^{16}O,2nγ); ^{72}Ge(^{12}C,4nγ); ^{78}Kr(α,2nγ).

1987Da05: ^{54}Fe(^{29}Si,n2pγ) E=85-110 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, $\gamma\gamma(\theta)$, $T_{1/2}$(levels) by Doppler-shift attenuation method.

1990He04: ^{58}Ni(^{24}Mg,2pγ) E=80, 85 MeV; ^{54}Fe(^{32}S,α2pγ). Measured $T_{1/2}$(levels in g.s. band) by Doppler-shift attenuation and recoil-distance Doppler-shift methods.

Other measurements:

1990St27: ^{52}Cr(^{34}S,α2nγ). Particle γ coin techniques.

Additional information 1.

1986Ni07: ^{54}Fe(^{28}Si,2pγ). Multiplicity measurements using coin techniques with separated-mass residuals.

1984BaZV, 1983AhZX: ^{51}V(^{32}S,p2nγ) E=120, 137, 159 MeV. Data for members of g.s. band.

1983Hi01 (also 1982HiZT): ^{78}Kr(α,2nγ) E=28.7 MeV. Measured γ, $\gamma\gamma$, $\gamma(\theta)$. Data are reported for 8 levels.

1983Th05, 1982Th03, 1982ThZY: ^{56}Fe(^{28}Si,2p2nγ) and ^{54}Fe(^{28}Si,2pγ) E=80-99 MeV. Measured γ, $\gamma\gamma$, $\gamma(\theta)$. Data are reported for 6 levels.

1982Li08: ^{58}Ni(^{24}Mg,2pγ) E=75 MeV. Measured γ, nγ coin, nnγ coin, $T_{1/2}$(levels) by RDM.

1981Fi03: ^{78}Kr(α,2nγ) E=28 MeV. Measured γ, $\gamma\gamma$, $\gamma(\theta)$ for three levels.

1974No08: ^{66}Zn(^{16}O,2nγ) E=42-58 MeV. Measured γ, $\gamma(\theta)$, nγ, $T_{1/2}$ by recoil-distance method.

1972InZU, 1971InZZ: ^{72}Ge(^{12}C,4nγ). Measured γ.

A 1327 level (deexciting through a 941.5γ) reported by 1981Fi03 in (α,2nγ) reaction is omitted since it has not been confirmed in any other study.

^{80}Sr Levels

E(level)[†]	J$^\pi$[#]	$T_{1/2}$[‡]	Comments
0.0[c]	0$^+$		
385.90[c] *10*	2$^+$	34.2 ps *12*	$T_{1/2}$: from RDM (1990He04). Others: 37 ps *3* (1982Li08), 40 ps *7* (1982HiZT), 44 ps *6* (1974No08).
980.93[c] *14*	4$^+$	2.90 ps *14*	$T_{1/2}$: from RDM (1990He04). Others: 3.3 ps *5* (1982Li08), <8 ps (1974No08).
1140.5? *2*			E(level): level reported by 1983Hi01.
1571.3[d] *3*	(3$^+$)		
1763.5[c] *2*	6$^+$	0.56 ps *6*	$T_{1/2}$: from RDM and DSA method (1990He04). Other: 1.2 ps *4* or 1.3 ps *+22−13* (DSA method,1987Da05).
2296.0[d] *3*	(5$^+$)		
2700.3[c] *3*	(8$^+$)	0.33 ps *4*	$T_{1/2}$: RDM and DSA method (1990He04). Other: 0.22 ps *3* (DSA method,1987Da05).
3172.6[d] *4*	(7$^+$)	0.8[@] ps *6*	
3580.2 *5*	(7$^+$)	>21[@] ps	$T_{1/2}$: >21 ps *19* (1987Da05).
3601.8[f] *5*	(7$^+$)	>21[@] ps	$T_{1/2}$: >21 ps *19* (1987Da05).
3639.0[ae] *4*	J		
3765.6[c] *4*	(10$^+$)	0.24[@] ps *3*	$T_{1/2}$: others: 0.17 ps *6* (1987Da05, with full feeding correction); 0.340 ps *14* (1990He04, DSA method with no correction for feeding cascades).
4169.3[d] *5*	(9$^+$)	<3.2[&] ps	$T_{1/2}$: <2.4 ps *8* (1987Da05).
4301.1[ae] *4*	J+2	0.5[@] ps *+15−5*	
4378.5[f] *5*	(9$^+$)	0.9[@] ps *+12−6*	
4951.9[c] *4*	(12$^+$)	0.079[@] ps *17*	
5167.7[ae] *4*	J+4	1.2[@] ps *+15−5*	
5274.0[d] *6*	(11$^+$)		

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^{54}Fe(^{29}Si,n2pγ) 1987Da05 (continued)

^{80}Sr Levels (continued)

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[‡]	Comments
5348.5[f] *6*	(11$^+$)	0.35[@] ps *6*	
6202.6[ae] *4*	J+6	<1.1[&] ps	T$_{1/2}$: <0.97 ps *11* (1987Da05).
6276.2[c] *5*	(14$^+$)	0.037[@] ps *11*	
6468.3[f] *6*	(13$^+$)	0.16[@] ps *+3−6*	
6494.2[d] *7*	(13$^+$)		
7400.8[ae] *5*	J+8		
7728.7[f] *8*	(15$^+$)	<0.27[&] ps	T$_{1/2}$: <0.24 ps *3* (1987Da05).
7750.3[c] *6*	(16$^+$)	0.013[@] ps *13*	
7833.6[d] *11*	(15$^+$)		
8782.6[ae] *6*	J+10		
9096.4[f] *9*	(17$^+$)	<0.31[&] ps	T$_{1/2}$: <0.27 ps *4* (1987Da05).
9328.7[c] *7*	(18$^+$)	0.040[@] ps *21*	
10537.3[f] *10*	(19$^+$)	<0.27[&] ps	T$_{1/2}$: <0.24 ps *3* (1987Da05).
11065.0[c] *10*	(20$^+$)	<0.14[&] ps	T$_{1/2}$: <0.12 ps *2* (1987Da05).
12069.8[f] *12*	(21$^+$)		
12922.0?[bc] *15*	(22$^+$)		
13718.5?[f] *13*	(23$^+$)		
14942.9?[bc] *16*	(24$^+$)		
15464.5?[bf] *24*	(25$^+$)		
17095.4?[bc] *19*	(26$^+$)		

[†] From least-squares fit to Eγ's.
[‡] From Doppler-shift attenuation and recoil-distance Doppler-shift methods (1990He04,1987Da05). Separate uncertainties (one for measurement and other for stopping power) given by 1987Da05 have been combined in quadrature by the evaluator.
[#] From $\gamma(\theta)$, DCO ratios and T$_{1/2}$(level). For higher energy levels, J^π is from probable band assignment.
[@] From DSA method (1987Da05). Correction for side-feeding time is approximated by effective lifetime of preceding cascade transition.
[&] Upper limit from DSA method (1987Da05) with no correction for feeding through the preceding cascade transition.
[a] 1382-1198-1035-867-662-1343 cascade from 8782 level In 1987Da05 is ordered As 1382-1344-1198-1035-867-662 from 9882 level In 2003Si06 and 2000Wi01. Thus the level energies In this sequence differ from those In 2003Si06, 2000Wi01 and In Adopted Levels.
[b] Level not confirmed by 2003Si06 and 2000Wi01.
[c] Band(A): g.s. band.
[d] Band(B): side band based on 3$^+$.
[e] Band(C): side band.
[f] Band(D): side band based on (7$^+$). The parity of this band is opposite In 2003Si06.

γ(^{80}Sr)

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
385.9 *1*	110 *5*	385.90	2$^+$	0.0	0$^+$	E2	I$_\gamma$: 100 In (α,2nγ) (1983Hi01). A$_2$=+0.23 *2*, A$_4$=−0.065 *7*. DCO=0.92 *5*.
595.1 *1*	100.0 *10*	980.93	4$^+$	385.90	2$^+$	E2	I$_\gamma$: 72 *7* In (α,2nγ) (1983Hi01). E$_\gamma$: 594.1 quoted by 1987Da05 seems a misprint. A$_2$=+0.25 *2*, A$_4$=−0.098 *6*. DCO=1.02 *6*.

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^{54}Fe(^{29}Si,n2pγ) 1987Da05 (continued)

γ(^{80}Sr) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ ‡	Comments
662.1& *1*	7.5 *6*	4301.1	J+2	3639.0	J	(E2)		A_2=+0.10 *9*, A_4=−0.055 *24*. DCO=1.36 *24*.
724.4 *2*	10.2 *8*	2296.0	(5$^+$)	1571.3	(3$^+$)	@		A_2=+0.13 *7*. DCO=1.17 *19*.
754.6 *2*		1140.5?		385.90	2$^+$			I_γ: 16 *2* In (α,2nγ) (1983Hi01). γ reported by 1983Hi01 only in (α,2nγ) reaction.
776.7 *2*	5.8 *10*	4378.5	(9$^+$)	3601.8	(7$^+$)	@		DCO=1.03 *14*.
782.6 *1*	87.2 *10*	1763.5	6$^+$	980.93	4$^+$	E2		I_γ: 46 *5* In (α,2nγ) (1983Hi01). A_2=+0.21 *3*, A_4=−0.042 *11*. DCO=1.01 *5*.
798.3 *2*	6.1 *6*	4378.5	(9$^+$)	3580.2	(7$^+$)	(E2)		A_2=+0.33 *17*. R(DCO)=1.19 *19*.
866.6& *1*	8.9 *8*	5167.7	J+4	4301.1	J+2	(E2)		A_2=+0.18 *16*, A_4=−0.06 *4*. DCO=1.19 *23*.
876.6 *3*	8.6 *11*	3172.6	(7$^+$)	2296.0	(5$^+$)	@		DCO=1.08 *19*.
x885.4 *8*	5.6 *20*							E_γ: probably from 4056, (8) level In side band based on (4) (see Adopted Levels).
936.8 *2*	65.7 *11*	2700.3	(8$^+$)	1763.5	6$^+$	(E2)		I_γ: 23 *2* for 935.6γ In (α,2nγ) (1983Hi01). A_2=+0.25 *5*. DCO=0.98 *6*.
970.0 *2*	12.4 *7*	5348.5	(11$^+$)	4378.5	(9$^+$)	@		DCO=0.91 *12*.
996.7 *2*	13 *8*	4169.3	(9$^+$)	3172.6	(7$^+$)	@		DCO=1.12 *19*.
1034.9& *2*	11.0 *11*	6202.6	J+6	5167.7	J+4	@		E_γ: uncertainty assigned by the evaluator. DCO=0.99 *17*.
1065.3 *2*	51.1 *11*	3765.6	(10$^+$)	2700.3	(8$^+$)	@		I_γ: 14 *2* In (α,2nγ) (1983Hi01). A_2=+0.16 *9*. DCO=1.03 *6*.
1104.7 *3*	4.7 *24*	5274.0	(11$^+$)	4169.3	(9$^+$)			
1119.8 *3*	10.3 *10*	6468.3	(13$^+$)	5348.5	(11$^+$)	@		DCO=0.81 *12*.
1184.8 *3*	8 *3*	1571.3	(3$^+$)	385.90	2$^+$	D+Q#	+0.45 *8*	I_γ: 13 *2* In (α,2nγ) (1983Hi01). A_2=+0.27 *14*, A_4=+0.06 *4*. DCO=0.98 *10*.
1186.2 *2*	37.0 *25*	4951.9	(12$^+$)	3765.6	(10$^+$)	@		DCO=0.96 *6*.
1198.2& *2*	8.3 *18*	7400.8	J+8	6202.6	J+6	@		DCO=0.85 *26*.
1220.2 *3*	3.0 *30*	6494.2	(13$^+$)	5274.0	(11$^+$)	@		DCO=0.92 *23*.
1260.4 *4*	8.3 *10*	7728.7	(15$^+$)	6468.3	(13$^+$)	@		R(DCO)=0.95 *18*.
1315.7 *3*	9.9 *12*	2296.0	(5$^+$)	980.93	4$^+$	D+Q#	+0.38 *6*	I_γ: 5.4 *6* for 1316.9γ In (α,2nγ) (1983Hi01). A_2=+0.26 *9*, A_4=+0.07 *3*. DCO=0.95 *18*.
1324.3 *3*	23.5 *25*	6276.2	(14$^+$)	4951.9	(12$^+$)	@		DCO=1.01 *10*.
1339.4 *9*	2.5 *25*	7833.6	(15$^+$)	6494.2	(13$^+$)			
1343.0& *2*	13.5 *12*	3639.0	J	2296.0	(5$^+$)	@		DCO=1.07 *18*.
1367.7 *5*	6.1 *10*	9096.4	(17$^+$)	7728.7	(15$^+$)	@		DCO=1.06 *20*.
1381.7& *3*	1.4 *6*	8782.6	J+10	7400.8	J+8			
1440.8 *4*	5.5 *12*	10537.3	(19$^+$)	9096.4	(17$^+$)	@		DCO=0.83 *21*.
1474.1 *3*	19.1 *10*	7750.3	(16$^+$)	6276.2	(14$^+$)	@		DCO=0.90 *13*.
1532.5 *6*	3.7 *10*	12069.8	(21$^+$)	10537.3	(19$^+$)			
x1547 *1*	4.0 *20*							E_γ: probably from 10878, (20$^+$) level In g.s. band (see Adopted Levels).
1578.4 *4*	7.2 *7*	9328.7	(18$^+$)	7750.3	(16$^+$)	@		DCO=0.88 *25*.
1648.7 *6*	2.6 *10*	13718.5?	(23$^+$)	12069.8	(21$^+$)			
1678.1[b] *6*	2.7 *7*	4378.5	(9$^+$)	2700.3	(8$^+$)			
1736.3 *6*	5.4 *8*	11065.0	(20$^+$)	9328.7	(18$^+$)	@		DCO=0.97 *50*.
1746 *2*	1.3 *6*	15464.5?	(25$^+$)	13718.5?	(23$^+$)			
1816.8 *6*	6.8 *7*	3580.2	(7$^+$)	1763.5	6$^+$	D+Q#	−4.7[a] *15*	A_2=−0.40 *26*, A_4=+0.27 *7*. DCO=0.53 *20*.
1838.1 *6*	4.9 *6*	3601.8	(7$^+$)	1763.5	6$^+$	D+Q#	−2.8[a] *4*	A_2=−0.48 *13*, A_4=+0.14 *4*. DCO=0.75 *30*.
1857.0 *11*	3.5 *7*	12922.0?	(22$^+$)	11065.0	(20$^+$)	@		DCO=0.85 *25*.

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^{54}Fe(^{29}Si,n2pγ) 1987Da05 (continued)

$\gamma(^{80}Sr)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π
2020.8 *6*	3.3 *6*	14942.9?	(24^+)	12922.0?	(22^+)
2152.5 *11*	1.9 *6*	17095.4?	(26^+)	14942.9?	(24^+)

† From 1987Da05, unless otherwise stated.
‡ From $\gamma(\theta)$ and DCO ratios. Mult=D+Q is most likely M1+E2. For several other transitions, DCO ratios and/or A_2 values are consistent with ΔJ=2, mult=E2, but such assignments are not unique.
# Most likely M1+E2 as comparison with RUL for E2 and M2 transitions would suggest.
@ DCO ratios and/or A_2 value consistent with ΔJ=2 and mult=E2 but in evaluator's opinion such an assignment cannot be made uniquely.
& 1382-1198-1035-867-662-1343 cascade from 8782 level In 1987Da05 is ordered As 1382-1344-1198-1035-867-662 from 9882 level In 2003Si06 and 2000Wi01.
a Large positive A_4 is In disagreement with that In 2003Si06 2000Wi01 where the authors obtain almost isotropic result for A_4, thus large δ value given here is considered As questionable.
b Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

^{54}Fe(^{29}Si,n2pγ) 1987Da05

Level Scheme

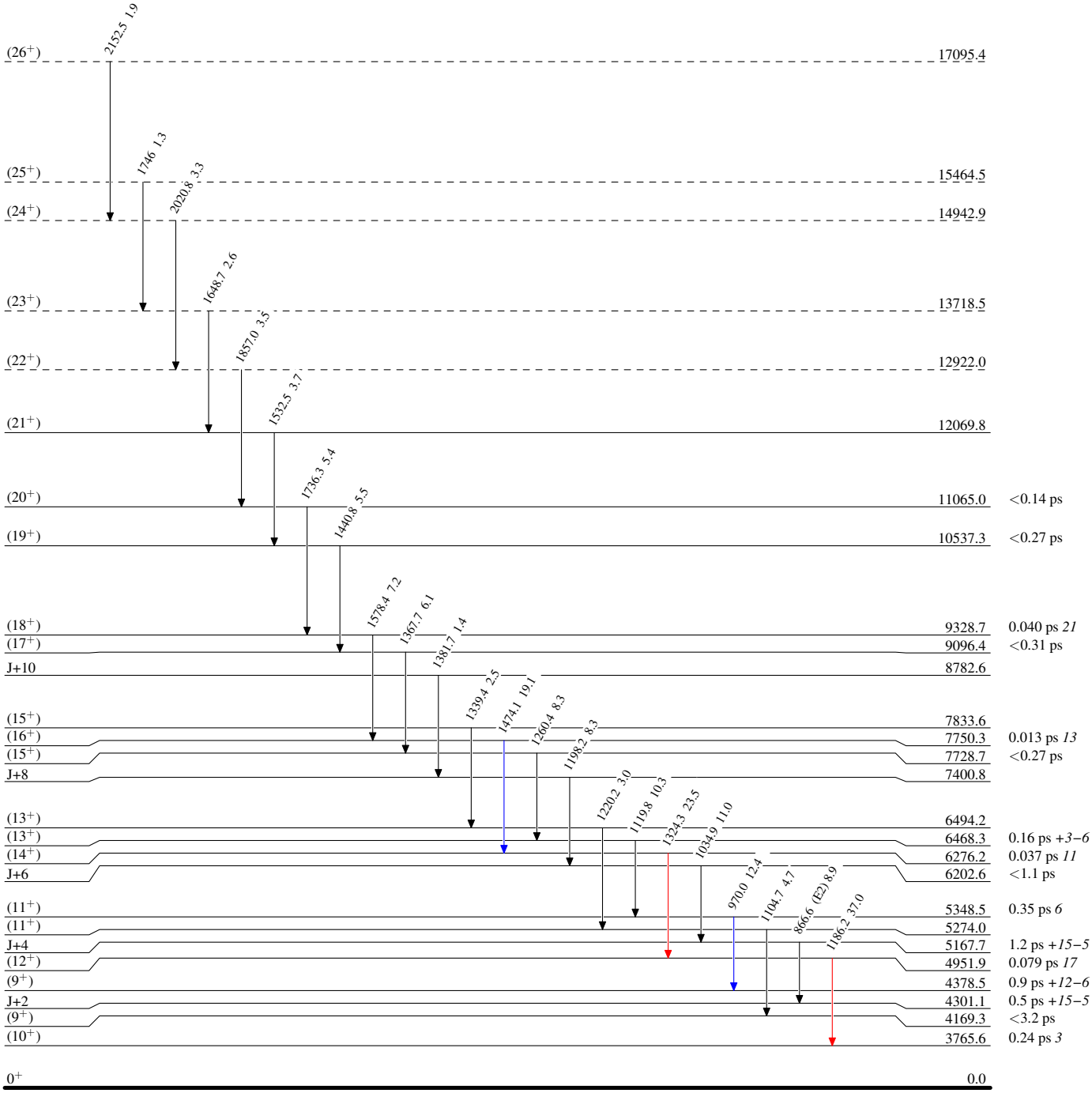
Intensities: Relative I_γ

Legend

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

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

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

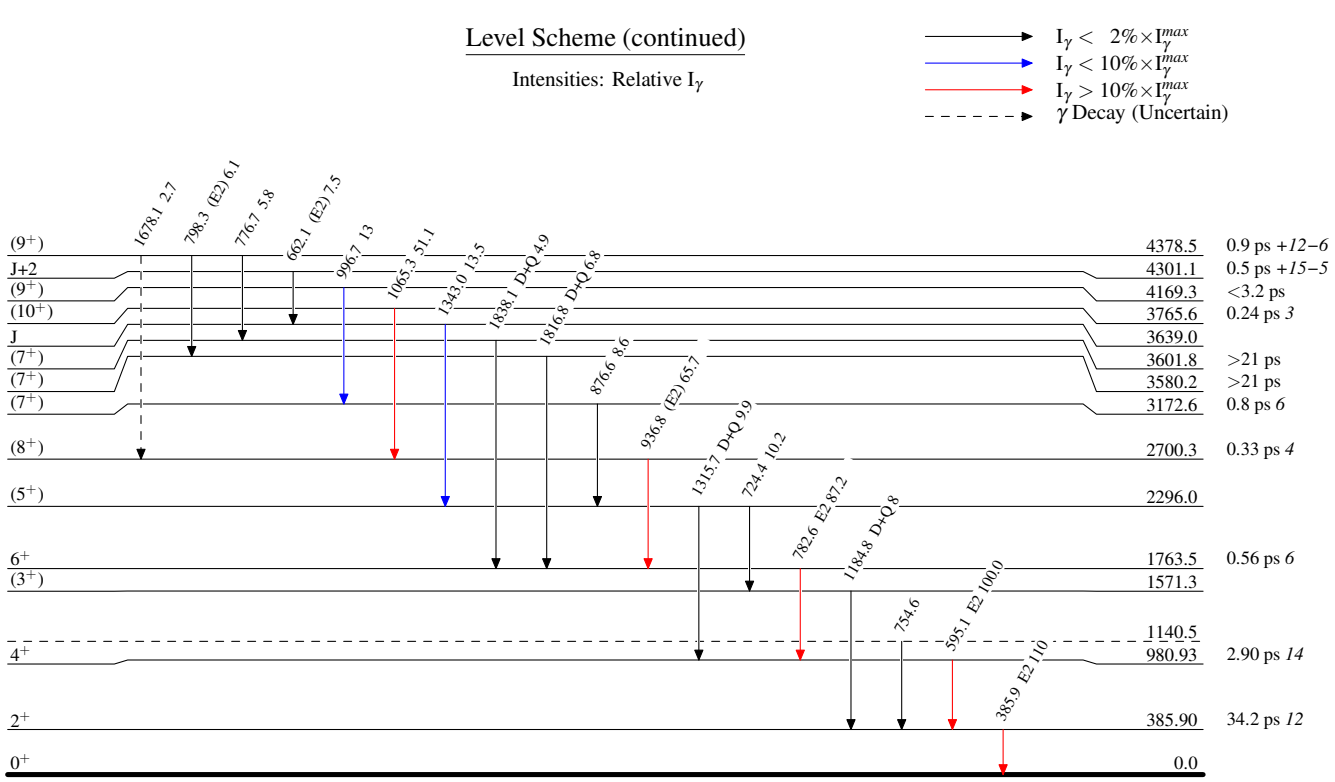


$^{80}_{38}Sr_{42}$

$^{54}Fe(^{29}Si,n2p\gamma)$ 1987Da05

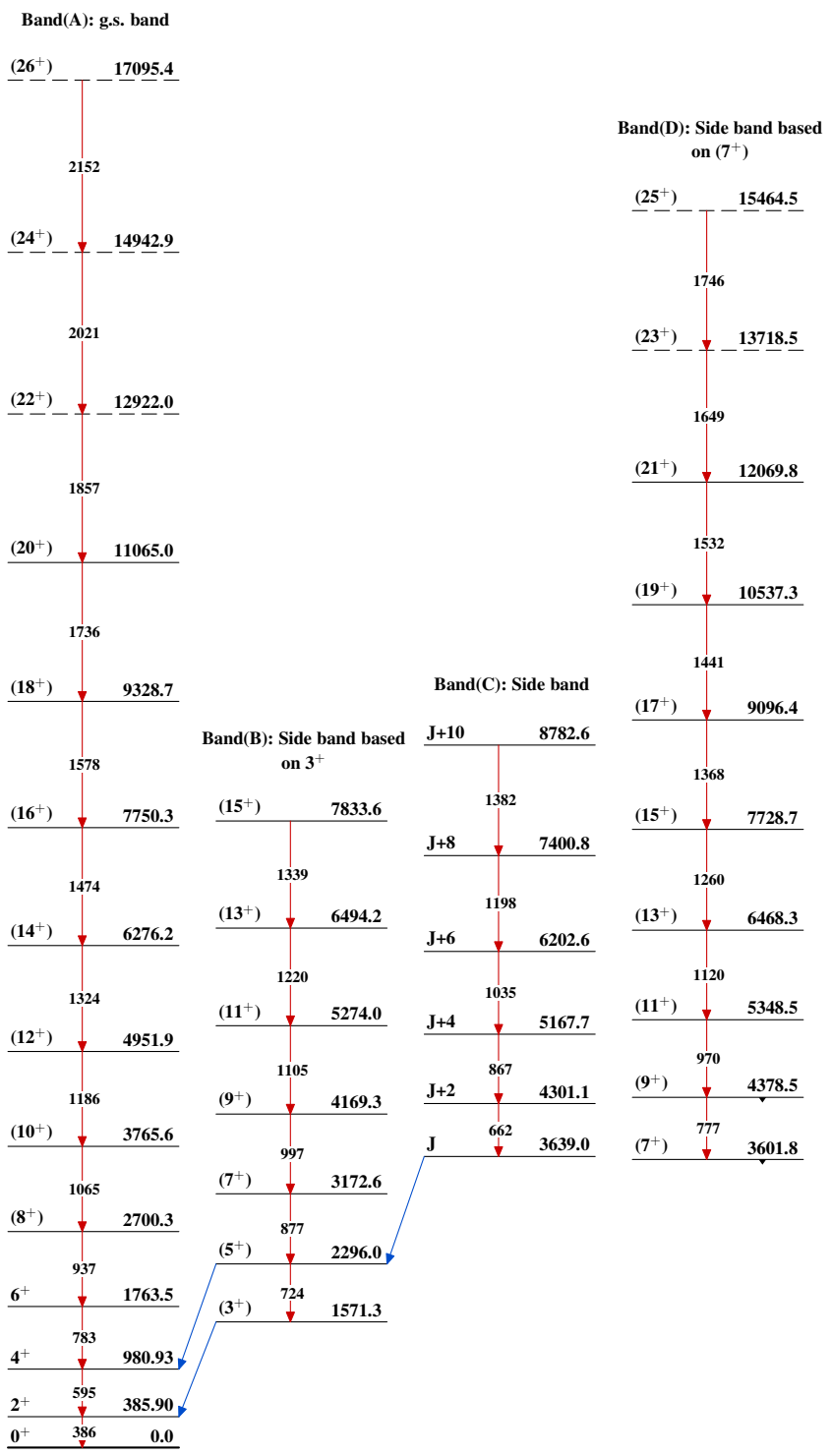
Level Scheme (continued)

Intensities: Relative I_γ



$^{80}_{38}Sr_{42}$

$^{54}Fe(^{29}Si,n2p\gamma)$ 1987Da05



$^{80}_{38}Sr_{42}$