^{40}Ca(^{28}Si,2$\alpha\gamma$),(^{32}S,3$\alpha\gamma$)   **1999Sv01,1998SvZZ,1998De14**

	History		
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 114, 1849 (2013)	31-Dec-2012

Additional information 1.

Reactions:

1999Sv01, 1998SvZZ, 1998SvZY: ^{40}Ca(^{28}Si,2$\alpha\gamma$) E=125 MeV, ^{40}Ca(^{32}S,3$\alpha\gamma$) E=134 MeV.

1998De14: ^{40}Ca(^{32}S,3$\alpha\gamma$).

1999Sv01 (also 1998SvZZ,1998SvZY): measured $\gamma\gamma$, particle-$\gamma\gamma$ using GAMMASPHERE array of Ge detectors and microball particle- detector array. Deduced SD band.

^{60}Zn Levels

E(level)	J$^{\pi\dagger}$	Comments
0‡	0$^+$	
1004.4‡ *4*	2$^+$	
2193.4‡ *6*	4$^+$	
3808.8‡ *8*	6$^+$	
5292.5‡ *10*	8$^+$	
8476.1 *15*	10$^+$	
8636.7 *19*	(10$^+$)	
9620.9$^{\&}$ *20*	(8$^+$)	
10756.9$^{\&}$ *18*	(10$^+$)	
12132.5$^{\&}$ *17*	(12$^+$)	
13698.4$^{\&}$ *18*	(14$^+$)	
15437.8$^{\&}$ *19*	(16$^+$)	
17323.3$^{\&}$ *20*	(18$^+$)	
19353.1$^{\&}$ *22*	(20$^+$)	
21597.4$^{\&}$ *23*	(22$^+$)	
24132.4$^{\&}$ *25*	(24$^+$)	
27007$^{\&}$ *3*	(26$^+$)	
30258$^{\&}$ *3*	(28$^+$)	
33899$^{\&}$ *5*	(30$^+$)	
0+x$^{\#}$		Additional information 2.
567.3+x$^{\#}$ *9*		
1575.6+x$^{\#}$ *23*		
3046+x$^{\#}$ *3*		
4967+x$^{\#}$ *3*		
7300+x$^{\#}$ *3*		
0+y$^{@}$		Additional information 3.
756.6+y$^{@}$ *9*		
2005.0+y$^{@}$ *13*		
3697.0+y$^{@}$ *15*		
5832.7+y$^{@}$ *18*		
8414.4+y$^{@}$ *22*		

† From 1999Sv01. The parentheses are added by the evaluator.

‡ Band(A): g.s. band.

^{40}Ca(^{28}Si,2$\alpha\gamma$),(^{32}S,3$\alpha\gamma$)   **1999Sv01,1998SvZZ,1998De14 (continued)**

^{60}Zn Levels (continued)

Band(B): band structure.

@ Band(C): band structure.

& Band(D): SD band (1999Sv01). Q(intrinsic)=2.75 *25* from lifetime data; β_2=0.47 *7*. Configuration=[22,22], implying two holes in πf7/2 and ν7/2 extruder orbitals and two particles in πg9/2 and νg9/2 intruder orbitals. Band intensity, as a fraction of channel intensity, is 60% *4* in (^{28}Si,2$\alpha\gamma$) and 34% *3* in (^{32}S,3$\alpha\gamma$).

γ(^{60}Zn)

E_γ[‡]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
567.3 *9*	1.2 *3*	567.3+x		0+x				
756.6 *9*	1.5 *3*	756.6+y		0+y				
1004.4 *4*	100.0	1004.4	2^+	0	0^+			
1008.3 *21*	4.2 *12*	1575.6+x		567.3+x				
1135.9 *9*	5.3 *5*	10756.9	(10^+)	9620.9	(8^+)			
1189.0 *4*	93 *4*	2193.4	4^+	1004.4	2^+			
1248.4 *9*	4.8 *5*	2005.0+y		756.6+y				
1375.6 *7*	26.8 *16*	12132.5	(12^+)	10756.9	(10^+)			
1470.1 *12*	4.5 *6*	3046+x		1575.6+x				
1483.7 *6*	53 *3*	5292.5	8^+	3808.8	6^+			
1565.9 *6*	60 *4*	13698.4	(14^+)	12132.5	(12^+)			
1615.4 *5*	69 *3*	3808.8	6^+	2193.4	4^+			
1692.0 *8*	5.7 *6*	3697.0+y		2005.0+y				
1739.3 *6*	60 *3*	15437.8	(16^+)	13698.4	(14^+)			
1885.5 *7*	58 *3*	17323.3	(18^+)	15437.8	(16^+)			
1921.2 *9*	6.5 *7*	4967+x		3046+x				
2029.8 *7*	57 *3*	19353.1	(20^+)	17323.3	(18^+)			
2135.6 *10*	5.0 *5*	5832.7+y		3697.0+y				
2244.2 *8*	53 *3*	21597.4	(22^+)	19353.1	(20^+)			
2332.5 *11*	5.0 *6*	7300+x		4967+x				
2535.0 *9*	41.7 *25*	24132.4	(24^+)	21597.4	(22^+)			
2581.7 *12*	2.7 *4*	8414.4+y		5832.7+y				
2874.8 *10*	27.3 *16*	27007	(26^+)	24132.4	(24^+)			
3183.6 *12*	21.3 *16*	8476.1	10^+	5292.5	8^+	E2	0.000890 *13*	α=0.000890 *13*; α(K)=2.82×10^{-5} *4*; α(L)=2.78×10^{-6} *4*; α(M)=3.99×10^{-7} *6*; α(N+..)=0.000858 *12* α(N)=1.621×10^{-8} *23*; α(IPF)=0.000858 *12* Mult.: ΔJ=2 from A$_2$=+0.37 *8*, A$_4$=−0.16 *10*.
3250.5 *12*	12.1 *11*	30258	(28^+)	27007	(26^+)			
3344.1 *20*	2.7 *4*	8636.7	(10^+)	5292.5	8^+			
3495.7 *20*	3.0 *5*	12132.5	(12^+)	8636.7	(10^+)			
3641.3 *35*	2.5 *7*	33899	(30^+)	30258	(28^+)			
3656.4 *14*	14.6 *12*	12132.5	(12^+)	8476.1	10^+	E2	0.001068 *15*	α=0.001068 *15*; α(K)=2.27×10^{-5} *4*; α(L)=2.24×10^{-6} *4*; α(M)=3.20×10^{-7} *5*; α(N+..)=0.001042 *15* α(N)=1.304×10^{-8} *19*; α(IPF)=0.001042 *15* Mult.: ΔJ=2 from A$_2$=+0.38 *9*, A$_4$=−0.20 *11*.
5464 *4*	3.2 *6*	10756.9	(10^+)	5292.5	8^+			
5810 *5*	1.5 *4*	9620.9	(8^+)	3808.8	6^+			

^{40}Ca(^{28}Si,2$\alpha\gamma$),(^{32}S,3$\alpha\gamma$)   **1999Sv01,1998SvZZ,1998De14** (continued)

γ(^{60}Zn) (continued)

† Additional information 4.
‡ From 1999Sv01.
# From $\gamma\gamma(\theta)$(DCO) data (1998SvZZ) and T$_{1/2}$ considerations.

^{40}Ca(^{28}Si,2$\alpha\gamma$),(^{32}S,3$\alpha\gamma$)　　　1999Sv01,1998SvZZ,1998De14

Level Scheme

Intensities: Relative I$_\gamma$

Legend

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
I$_\gamma$ > 10%×I$_\gamma^{max}$

2581.7 2.7
2135.6 5.0
1692.0 5.7
1248.4 4.8
756.6 1.5
2332.5 5.0
1921.2 6.5
1470.1 4.5
1008.3 4.2
567.3 1.2
3641.3 2.5
3250.5 12.1
2874.8 27.3
2535.0 41.7
2244.2 53
2029.8 57
1885.5 58
1739.3 60
1565.9 60
3656.4 E2 14.6
3495.7 3.0
1375.6 26.8
5464 3.2
1135.9 5.3
5810 1.5
3344.1 2.7
3183.6 E2 21.3
1483.7 53
1615.4 69
1189.0 93
1004.4 100.0
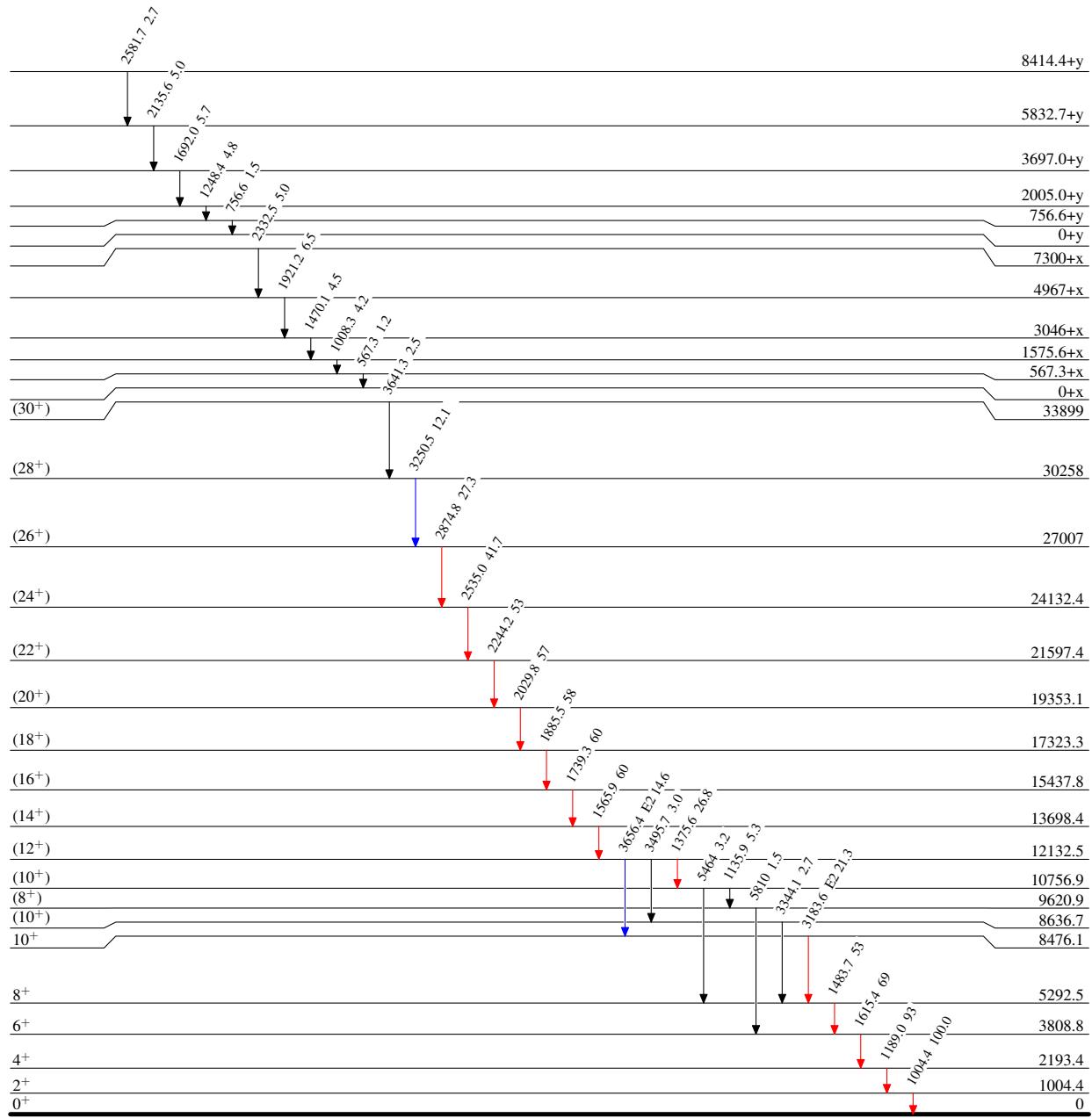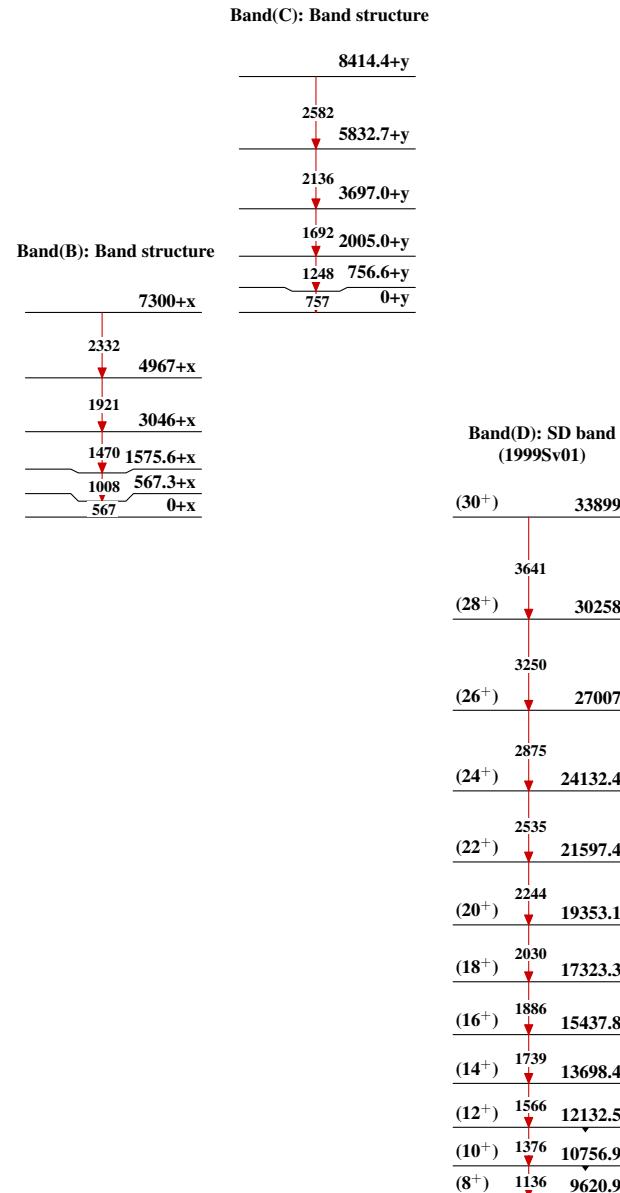
8414.4+y
5832.7+y
3697.0+y
2005.0+y
756.6+y
0+y
7300+x
4967+x
3046+x
1575.6+x
567.3+x
0+x
(30$^+$)　33899
(28$^+$)　30258
(26$^+$)　27007
(24$^+$)　24132.4
(22$^+$)　21597.4
(20$^+$)　19353.1
(18$^+$)　17323.3
(16$^+$)　15437.8
(14$^+$)　13698.4
(12$^+$)　12132.5
(10$^+$)　10756.9
(8$^+$)　9620.9
(10$^+$)　8636.7
10$^+$　8476.1
8$^+$　5292.5
6$^+$　3808.8
4$^+$　2193.4
2$^+$　1004.4
0$^+$　0

$^{60}_{30}$Zn$_{30}$

^{40}Ca(^{28}Si,2$\alpha\gamma$),(^{32}S,3$\alpha\gamma$)   **1999Sv01,1998SvZZ,1998De14**

Band(C): Band structure

8414.4+y

2582

5832.7+y

2136

3697.0+y

1692   2005.0+y

1248   756.6+y

757   0+y

Band(B): Band structure

7300+x

2332

4967+x

1921

3046+x

1470   1575.6+x

1008   567.3+x

567   0+x

Band(D): SD band
(1999Sv01)

(30$^+$)   33899

3641

(28$^+$)   30258

3250

(26$^+$)   27007

2875

(24$^+$)   24132.4

2535

(22$^+$)   21597.4

2244

(20$^+$)   19353.1

2030

(18$^+$)   17323.3

1886

(16$^+$)   15437.8

1739

(14$^+$)   13698.4

(12$^+$)   1566   12132.5

(10$^+$)   1376   10756.9

(8$^+$)   1136   9620.9

Band(A): g.s. band

8$^+$ 5292.5

6$^+$ 1484   3808.8

4$^+$ 1615   2193.4

2$^+$ 1189   1004.4

0$^+$ 1004   0

$^{60}_{30}$Zn$_{30}$