^{35}Si β^- decay (0.78 s)   1988DuZS,1986Du07,1988DuZT

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, John Cameron and Balraj Singh	NDS 112,2715 (2011)	20-Oct-2011

Parent: ^{35}Si: E=0; J$^\pi$=(7/2$^-$); T$_{1/2}$=0.78 s 12; Q(β^-)=10500 40; %β^- decay=100.0

^{35}Si-J$^\pi$,T$_{1/2}$: From Adopted Levels of ^{35}Si.

^{35}Si-Q(β^-): From 2011AuZZ, 2003Au03.

1988DuZS, 1986Du07, 1988DuZT: ^{35}Si produced by fragmentation of ^{40}Ar beam of 2x10^{11} particles/s at 60 MeV/nucleon on a 190 mg/cm^2 Be target at GANIL. Decay observed with a 1 mm thick plastic scintillator and a 174 cm^3 intrinsic Ge detector (1.2% absolute efficiency at 1.33 MeV). Measured $\beta\gamma$(t), Eγ, Eγ. Deduced levels, J$^\pi$, T$_{1/2}$.

Additional information 1.

2007Ne14: measured ground state g-factor using the β-NMR method.

^{35}P Levels

With three γ-rays unplaced, large Q-Value of 10.5 MeV, there could additional transitions to levels up to 5.6 MeV and the level scheme could be incomplete.

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[‡]
0	1/2$^+$	47.3 s 8
2386.5 5	3/2$^+$	
3859.8 6	5/2$^+$	
4101.1 6	(7/2$^-$)	
4381.3? 8		
4493.4 6	(7/2$^-$)	
4869.4 9		
4962.3? 7		
5560.7 7		

[†] From least-squares fit to Eγ's.

[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log ft	Comments
(4.94×10^3 4)	5560.7	<12.4	>4.6	av Eβ=2249 20
				Additional information 2.
(5.63×10^3 4)	4869.4	<10.8	>4.9	av Eβ=2588 20
				Additional information 3.
(6.01×10^3 4)	4493.4	<21.4	>4.8	av Eβ=2773 20
				Additional information 4.
(6.12×10^3 4)	4381.3?	<9.4	>5.2	av Eβ=2828 20
				Additional information 5.
(6.40×10^3 4)	4101.1	<46	>4.6	av Eβ=2966 20
				Additional information 6.
(6.64×10^3 4)	3859.8	<2	>6.0	av Eβ=3084 20

[†] From 1988DuZS, except that these are given here as upper limits only, since the decay scheme is considered as incomplete in view of large Q value and the possibility of missing transitions from higher levels.

[‡] Absolute intensity per 100 decays.

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$\gamma(^{35}P)$

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π
241.4 *3*	100 *4*	4101.1	$(7/2^-)$	3859.8	$5/2^+$
392.3 *3*	58 *3*	4493.4	$(7/2^-)$	4101.1	$(7/2^-)$
468.9[‡&] *4*	18.7 *25*	4962.3?		4493.4	$(7/2^-)$
633.7 *5*	22 *3*	4493.4	$(7/2^-)$	3859.8	$5/2^+$
768.0 *4*	16 *3*	4869.4		4101.1	$(7/2^-)$
1009.9 *5*	24 *5*	4869.4		3859.8	$5/2^+$
1459.7 *5*	12 *4*	5560.7		4101.1	$(7/2^-)$
1473.4 *5*	17 *4*	3859.8	$5/2^+$	2386.5	$3/2^+$
1714.7 *6*	22 *5*	4101.1	$(7/2^-)$	2386.5	$3/2^+$
1994.8[#&] *6*	36 *6*	4381.3?		2386.5	$3/2^+$
2386.4 *6*	117 *7*	2386.5	$3/2^+$	0	$1/2^+$
3173.5 *10*	35 *6*	5560.7		2386.5	$3/2^+$
[x]3349.1 *10*	46 *6*				
[x]3590.0 *11*	60 *7*				
3859.5 *10*	121 *8*	3859.8	$5/2^+$	0	$1/2^+$
4100.8 *10*	135 *8*	4101.1	$(7/2^-)$	0	$1/2^+$

[†] From 1986Du07, unless otherwise noted.

[‡] Unplaced γ ray in 1986Du07 and 1988DuZS. The placement is from γ ray of the same energies observed in 2008Wi09 in ^{208}Pb(^{36}S,Xγ).

[#] Placement from 1988DuZS. In 1988DuZT, this γ was placed from a 6095.8 (there is a legibility problem in this report as the level may be read as 6035.8, as seems to have been done in 1990En08 evaluation). However, in view of in-beam results from 2008Wi09, 1994.8γ most likely deexcites a 4381 level, not a 6095 level.

[@] For absolute intensity per 100 decays, multiply by 0.27 *1*.

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

[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: I_γ per 100 parent decays

Legend

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

$(7/2^-)$ 0   0.78 s 12

$Q_{\beta^-}=10500\ 40$ $\%\beta^-=100$

${}^{35}_{14}Si_{21}$

$I\beta^-$	Log ft
<12.4	>4.6

5560.7

<10.8   >4.9

4962.3
4869.4

<21.4   >4.8 $(7/2^-)$ 4493.4
<9.4   >5.2   4381.3

<46   >4.6 $(7/2^-)$ 4101.1

<2   >6.0 $5/2^+$ 3859.8

3173.5 9.5
1459.7 3.2
468.9 5.0
1009.9 6.5
768.0 4.3
633.7 5.9
392.3 15.7
1994.8 9.7
4100.8 36
1714.7 5.9
241.4 27.0
3859.5 32.7
1473.4 4.6
2386.4 31.6

$3/2^+$ 2386.5

$1/2^+$ 0   47.3 s 8

${}^{35}_{15}P_{20}$