^{52}V β^- decay (3.743 min)   1977Ya08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 128, 185 (2015)	10-Jul-2015

Parent: ^{52}V: E=0.0; J$^\pi$=3$^+$; T$_{1/2}$=3.743 min 5; Q(β^-)=3974.5 9; %β^- decay=100.0

^{52}V-J$^\pi$: $\beta\gamma$-circular polarization rules out J(^{52}V)=2 and is consistent with J=3 (1967Bl10).

1977Ya08: chemically separated sources from ^{51}V(n,γ), measured Eγ, Iγ, a Compton suppression spectrometer system, several large volume Ge(Li).

1976Ar13: measured Eγ, Iγ, Ge(Li).

1971Ok03: measured Eγ, Iγ, $\gamma\gamma$-coin, Ge(Li).

Decay scheme from 1977Ya08.

^{52}Cr Levels

E(level)	J$^{\pi\dagger}$
0.0	0$^+$
1434.081 10	2$^+$
2369.596 22	4$^+$
2647.1?	4$^+$
2767.75 3	4$^+$
2964.775 15	2$^+$
3161.65 14	2$^+$
3415.22 4	4$^+$
3472.4 3	3$^+$
3771.9 5	2$^+$

† From Adopted Levels.

β^- radiations

E(decay)	E(level)	I$\beta^{-\dagger}$	Log ft	Comments
(202.6 10)	3771.9	0.0025 14	5.52 25	av Eβ= 58.7 4
(502.1 10)	3472.4	0.002 1	6.95 22	av Eβ= 165.0 4
(559.3 9)	3415.22	0.03 1	5.94 15	av Eβ= 186.0 4
(812.9 9)	3161.65	0.008 1	7.11 6	av Eβ= 288.9 5
(1009.7 9)	2964.775	0.116 2	6.305 9	av Eβ= 372.1 5
(1206.8 9)	2767.75	0.570 13	5.914 11	av Eβ= 457.9 5
(1604.9 9)	2369.596	0.052 10	7.45 9	av Eβ= 636.5 6
(2540.4 9)	1434.081	99.2 10	5.0002 15	av Eβ= 1073.5 6

† Absolute intensity per 100 decays.

γ(^{52}Cr)

Iγ normalization: from ΣIγ(g.s.)=100.

Eγ, Iγ from 1977Ya08, except as noted.

Eγ	I$\gamma^\ddagger$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
398.08 9	0.008 1	2767.75	4$^+$	2369.596	4$^+$	Iγ: authors give Iγ=0.088 in their table iv and Iγ=0.008 in their drawing. From adopted branching from 2768 level, one expects Iγ=0.010.

^{52}V β^- **decay (3.743 min)   1977Ya08 (continued)**

$\gamma(^{52}$Cr) (continued)

E_γ	$I_\gamma^{\ddagger}$	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	$\delta^\dagger$	Comments
647.47 2	0.024 2	3415.22	4$^+$	2767.75	4$^+$	M1+E2	0.22 8	
704.6 3	0.0018 9	3472.4	3$^+$	2767.75	4$^+$	M1+E2	−0.14 6	
766.0$^{\#}$ 10		3415.22	4$^+$	2647.1?	4$^+$			1976Ar13 claim to have observed the 766γ with an intensity ≈1.3 times that of the 647.5. The Compton suppressed Ge(Li) spectra of 1977Ya08 demonstrate this is in error. 1978Be32 consider no evidence for 766γ in these spectra, and estimate Iγ(766)/Iγ(647) can not be greater than 0.05.
935.52 2	0.061 3	2369.596	4$^+$	1434.081	2$^+$	E2		
1045.72 5	<0.01	3415.22	4$^+$	2369.596	4$^+$			
1212.9$^{\#}$		2647.1?	4$^+$	1434.081	2$^+$			1976Ar13 reported this γ with a relative intensity of 0.22 5. There is no evidence for a 1213-keV γ in the Compton suppressed Ge(Li) spectra of 1977Ya08. This, and the apparent absence of a 766-keV γ, claimed by 1976Ar13 to feed a level at 2647 keV, lead evaluators to doubt that the 2647-keV level is detectably populated.
1333.62 3	0.588 10	2767.75	4$^+$	1434.081	2$^+$	E2		E$_\gamma$: authors′ value of 1332.62 given in table iv is a misprint.
1434.06 1	100 1	1434.081	2$^+$	0.0	0$^+$	E2		
1530.67 1	0.116 2	2964.775	2$^+$	1434.081	2$^+$	M1+E2	−6.25 15	
1727.52 15	0.007 1	3161.65	2$^+$	1434.081	2$^+$	M1+E2	−0.18 7	
1981.1 4	0.005 1	3415.22	4$^+$	1434.081	2$^+$			
2337.7 5	0.0015 9	3771.9	2$^+$	1434.081	2$^+$	M1+E2	−0.20 8	
2965 1	0.0005 2	2964.775	2$^+$	0.0	0$^+$	E2		
3161.7 4	0.0009 2	3161.65	2$^+$	0.0	0$^+$	E2		
3772 1	0.0010 5	3771.9	2$^+$	0.0	0$^+$			

† From adopted gammas.

‡ For absolute intensity per 100 decays, multiply by 1.00 1.

$^{\#}$ Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: I(γ+ce) per 100 parent decays

Legend

⟶	$I_\gamma < 2\% \times I_\gamma^{max}$
⟶ (blue)	$I_\gamma < 10\% \times I_\gamma^{max}$
⟶ (red)	$I_\gamma > 10\% \times I_\gamma^{max}$
- - -⟶	γ Decay (Uncertain)
●	Coincidence

3^+ 0.0   3.743 min 5

Q_{β^-}=3974.5 9   %β^-=100

$^{52}_{23}$V$_{29}$

Iβ^-	Log ft		
0.0025	5.52	2^+	3771.9
0.002	6.95	3^+	3472.4
0.03	5.94	4^+	3415.22
0.008	7.11	2^+	3161.65
0.116	6.305	2^+	2964.775
0.570	5.914	4^+	2767.75
		4^+	2647.1
0.052	7.45	4^+	2369.596
99.2	5.0002	2^+	1434.081
		0^+	0.0

Transitions (labels):
- 3772 0.0010
- 2337.7 M1+E2 0.0015
- 704.6 M1+E2 0.0018
- 1981.1 0.007
- 1045.72 <0.01
- 766.0
- 647.47 M1+E2 0.026
- 3161.7 E2 0.0011
- 1727.52 M1+E2 0.009
- 2965 E2 0.0007
- 1530.67 M1+E2 0.170
- 1333.62 E2 0.588
- 398.08 0.010
- 1212.9
- 935.52 E2 0.061
- 1434.06 E2 101.0

$^{52}_{24}$Cr$_{28}$