^{57}V β^- decay (350 ms) 2003Ma02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	12-Apr-2010

Parent: ^{57}V: E=0; J^π=(7/2$^-$); $T_{1/2}$=350 ms *10*; Q(β^-)=8.34×10^3 *23*; %β^- decay=100.0

^{57}V-J^π,$T_{1/2}$: From ^{57}V Adopted Levels.

^{57}V-Q(β^-): From 2009AuZZ, 2003Au03.

2003Ma02: ^{57}V obtained from fragmentation of the primary beam of $^{86}Kr^{14+}$ at E=140 MeV/nucleon in a thick Be target followed by separation of fragment isotopes based on atomic mass and atomic number. Measured Eγ, Iγ, $\gamma\gamma$, $\beta\gamma$ using six Ge detectors from the NSCL SeGA array.

Placement of γ rays is from energy sums, no $\beta\gamma\gamma$ coincidence events were detected in 2003Ma02.

1998So03: ^{57}V activity produced by the fragmentation of 64.5 MeV/nucleon ^{65}Cu beam impinging on a ^{9}Be target and subsequent mass separation using the lise3 spectrometer. Measured $T_{1/2}$ from β^- singles and β-γ coincidence decay curves. Three γ rays were detected at 267 *4*, 700 *50* and 900 *50* keV with intensities of 60, 30, and 30%, QRPA calculations.

1998Am04: $T_{1/2}$ measurement and production of ^{57}V.

1990Tu01: ^{57}V production.

^{57}Cr Levels

E(level)[†]	J^π	Comments
0.0	(3/2)$^-$	
267.9 *3*	(5/2$^-$)	
692.3 *3*	(5/2$^-$)	
941.7 *5*	(7/2$^-$)	
1582.2 *6*		E(level): it should be noted that 1314.3 *5*+267.8 *3*=1582.1 *6* and 892.5 *6*+692.4 *4*=1584.9 *7* differ by 2.8 *9* keV. This suggest two separate levels near this energy. See comment in 'Adopted Levels', where 892.5γ and 1314.3γ are placed from two separate levels based on above discrepancy in energy sum and on results from ^{14}C(^{48}Ca,αnγ) reaction. In the latter reaction, a strong 639.1γ is also seen from a 1581 level. It is not obvious why this γ ray was missed in β^- study.

[†] From least-squares fit to Eγ's.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*[†]	Comments
(6.76×10^3 *23*)	1582.2	3 *2*	5.8	av Eβ=2978 *15*
(7.40×10^3 *23*)	941.7	9 *2*	5.2	av Eβ=3292 *15*
(7.65×10^3 *23*)	692.3	20 *3*	5.0	av Eβ=3414 *15*
(8.07×10^3 *23*)	267.9	47 *5*	4.7	av Eβ=3622 *15*
(8.34×10^3 *23*)	0.0	21 *5*	5.1	av Eβ=3753 *15*

[†] Apparent β feedings, thus log *ft* values should be considered (by the evaluator) as lower limits only, thus no uncertainties in log *ft* values are listed.

[‡] Absolute intensity per 100 decays.

^{57}V β^- decay (350 ms) 2003Ma02 (continued)

$\gamma(^{57}Cr)$

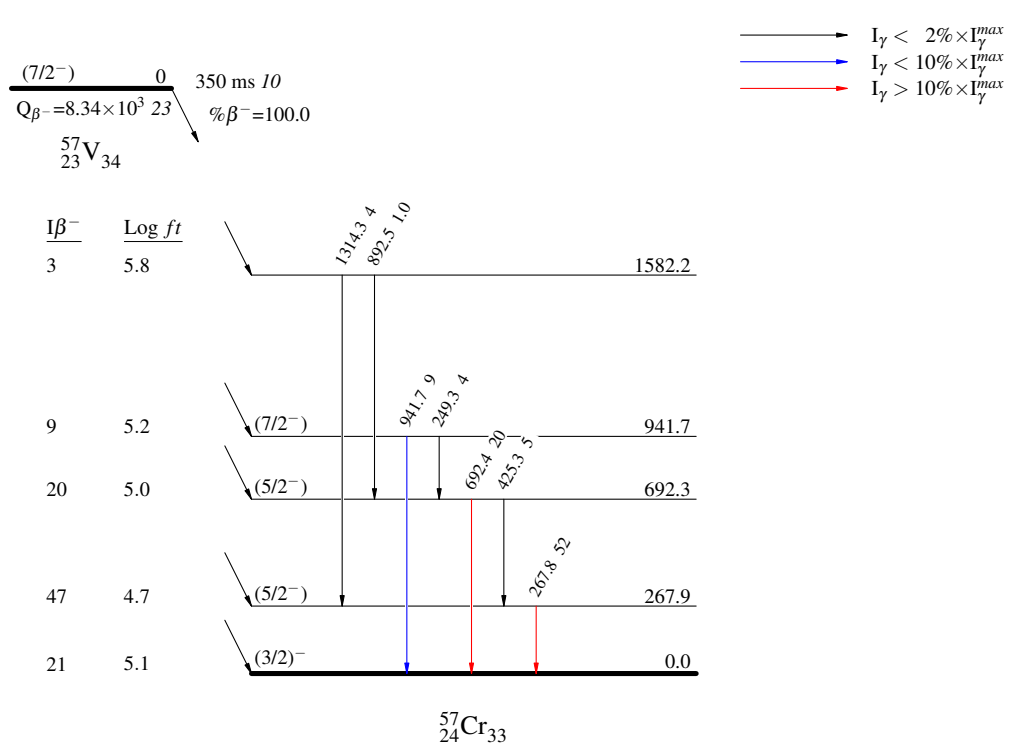
E_γ	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Comments
249.3 *7*	2 *1*	941.7	(7/2$^-$)	692.3	(5/2$^-$)	
267.8 *3*	52 *4*	267.9	(5/2$^-$)	0.0	(3/2)$^-$	E_γ: 267 *4* (1998So03), Iγ=60%.
425.3 *5*	3 *1*	692.3	(5/2$^-$)	267.9	(5/2$^-$)	
692.4 *4*	20 *3*	692.3	(5/2$^-$)	0.0	(3/2)$^-$	E_γ: 700 *50* (1998So03), Iγ=30%.
892.5 *6*	1.0 *5*	1582.2		692.3	(5/2$^-$)	
941.7 *5*	7 *1*	941.7	(7/2$^-$)	0.0	(3/2)$^-$	E_γ: 900 *50* (1998So03), Iγ=30%.
[x]1289.6 *5*	2 *1*					
1314.3[‡] *5*	2 *1*	1582.2		267.9	(5/2$^-$)	

[†] Iγ/100 decays were deduced (by 2003Ma02) from the number of observed γ rays, the γ-ray efficiency curve and the number of ^{57}V implants correlated with β decays.
[‡] In ^{14}C(^{48}Ca,αnγ), a 1581 level was shown to decay by 639.1γ and 1313.8γ. In β^- decay,
[#] Absolute intensity per 100 decays.
[x] γ ray not placed in level scheme.

^{57}V β^- decay (350 ms) 2003Ma02

Decay Scheme

Intensities: I_γ per 100 parent decays



$^{57}_{24}Cr_{33}$