^{59}V β^- decay 2005Li53,1999So20

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 151, 1 (2018)	1-Apr-2018

Parent: ^{59}V: E=0.0; J^π=(5/2$^-$,3/2$^-$); $T_{1/2}$=97 ms *2*; Q(β^-)=1.025×10^4 *27*; %β^- decay=100.0

^{59}V-%β^- decay: %β^-n<3, estimated by 2005Li53 from its decay to first 2$^+$ state in ^{58}Cr with a lower limit of ≈3% based on observed coincidences between transitions in ^{59}Cr and those known in ^{58}Cr.

2005Li53: ^{59}V isotope produced from fragmentation of ^{86}Kr^{34+} beam on a Be target. Fragments were analyzed using the A1900 fragment separator. Fragment identification was performed by a combination of multiple energy-loss signals and time-of-flight. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\beta$(t), half-life with 12 Ge detectors from the MSU segmented Ge array and double-sided Si microstrip detector.

1999So20: source from ^{58}Ni(^{86}Kr,X), E(^{86}Kr)=60.4 MeV/nucleon; doubly achromatic spectrometer LISE3; measured B(t), Eγ.

All data from 2005Li53, except otherwise noted.

^{59}Cr Levels

E(level)[†]	J^π	$T_{1/2}$	Comments
0.0	(1/2$^-$)	0.74 s *28*	$T_{1/2}$: From Adopted Levels.
207.7 *4*	(3/2$^-$)		
309.6 *4*	(5/2$^-$)		
524.7?[‡] *5*			
800.1 *4*			
915.3 *5*			
1340.6 *5*			
1365.7 *5*			
1531.6?[‡] *6*			
2508.6? *5*			

[†] From least-squares fit to γ-ray energies.

[‡] The ordering of the 841-317 and 1222-977 cascades are uncertain thus the location of the 525 and 1532 levels would be different if the orderings are reversed.

γ(^{59}Cr)

Iγ normalization: From 2005Li53, measured %Iγ.

E$_\gamma$	I$_\gamma$[&]	E$_i$(level)	J_i^π	E$_f$	J_f^π	Comments
102.0[‡] *4*	21 *2*	309.6	(5/2$^-$)	207.7	(3/2$^-$)	
207.8[‡] *4*	41 *3*	207.7	(3/2$^-$)	0.0	(1/2$^-$)	
317.3[#] *4*	3.0 *4*	524.7?		207.7	(3/2$^-$)	
[x]371.7 *5*	1.6 *3*					Coin with 208γ.
425.5 *4*	1.7 *3*	1340.6		915.3		
[x]463.1 *4*	1.7 *2*					Coin with 208γ, 823γ.
490.8 *5*	2.3 *4*	800.1		309.6	(5/2$^-$)	
592.4 *4*	4.2 *3*	800.1		207.7	(3/2$^-$)	
606.0 *4*	6.4 *4*	915.3		309.6	(5/2$^-$)	
707.6 *5*	1.1 *3*	915.3		207.7	(3/2$^-$)	
[x]784.1 *4*	1.8 *3*					Coin with 102γ, 208γ.
799.9 *5*	1.1 *3*	800.1		0.0	(1/2$^-$)	

Continued on next page (footnotes at end of table)

^{59}V β^- decay 2005Li53,1999So20 (continued)

$\gamma(^{59}Cr)$ (continued)

E_γ	I_γ[&]	E_i(level)	E_f	J^π_f	Comments
[x]823.2 *6*	1.1 *3*				Coin with 208γ, 463γ, 1222γ.
841.4[#] *4*	2.7 *3*	1365.7	524.7?		
[x]879.9[†] *5*	3.0 *4*				Coin with 1056γ.
[x]959.9 *4*	2.2 *3*				Coin with 208γ.
977.2[@] *5*	1.4 *2*	2508.6?	1531.6?		
1030.8 *4*	2.4 *3*	1340.6	309.6	$(5/2^-)$	
1056.0[†] *4*	2.5 *3*	1365.7	309.6	$(5/2^-)$	
1157.8 *5*	0.8 *2*	1365.7	207.7	$(3/2^-)$	
[x]1206.5 *6*	0.6 *2*				
1222.1[@] *4*	2.5 *3*	1531.6?	309.6	$(5/2^-)$	
[x]1529.6 *5*	1.0 *3*				Coin with 102γ, 208γ.
1593.4[a] *5*	2.2 *4*	2508.6?	915.3		
[x]1680.9 *5*	1.9 *3*				
[x]2089.6 *5*	0.9 *2*				
2198.7[a] *5*	0.5 *2*	2508.6?	309.6	$(5/2^-)$	
[x]2375.0 *6*	0.8 *2*				
[x]2601.3 *6*	1.2 *2*				

[†] Possible β-delayed neutron branch to excited levels in ^{58}Cr. Not Adopted by evaluator.
[‡] Ordering of the 102-208 cascade established from $\gamma\gamma$ coincidence measurements (2005Li53).
[#] Ordering of the 841-317 cascade not determined with certainty (2005Li53).
[@] Ordering of the 1222-977 cascade not determined with certainty (2005Li53).
[&] Absolute intensity per 100 decays.
[a] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Decay Scheme

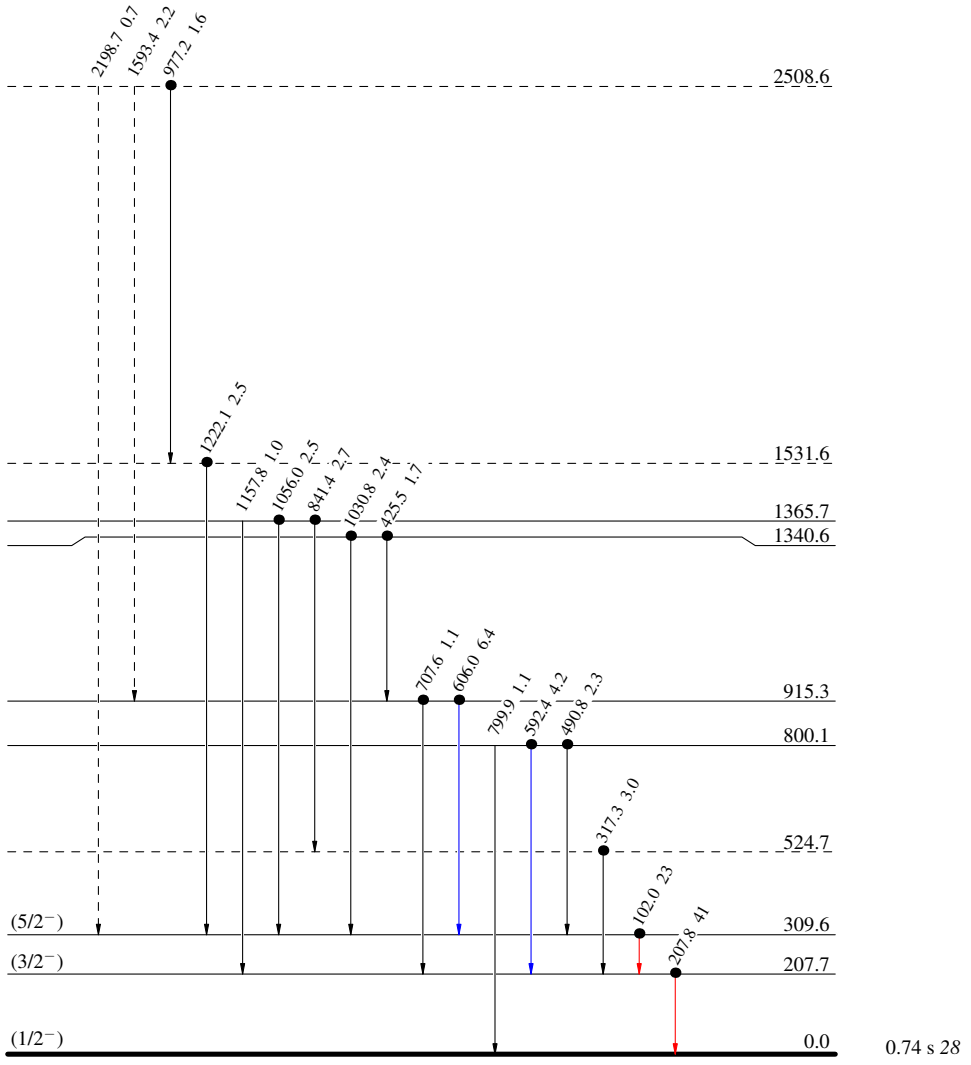
Intensities: I_γ per 100 parent decays

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)
- Coincidence

$(5/2^-,3/2^-)$ 0.0 97 ms *2*

Q_{β^-}=1.025×10^4 *27* $\%\beta^-$=100

$^{59}_{23}V_{36}$



$^{59}_{24}Cr_{35}$