

**Adopted Levels, Gammas**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Caroline D. Nesaraja, Scott D. Geraedts and Balraj Singh		NDS 111,897 (2010)	12-Jan-2010

Q( $\beta^-$ )=1.152×10<sup>4</sup> 24; S(n)=4.2×10<sup>3</sup> 3; S(p)=1.37×10<sup>4</sup> 3; Q( $\alpha$ )=-9.1×10<sup>3</sup> 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record 11.63E3 32 4.09E3 3413.95E3 52-8.41E3 45 [2009AuZZ,2003Au03](#).

Q( $\beta^-$ n)=4240 250 ([2009AuZZ,2003Au03](#)).

S(2n)=10270 320 ([2009AuZZ](#)); S(2p)=29520 740 ([2009AuZZ,syst](#)).

[1994Se12](#), [1990Tu01](#): first identification of <sup>58</sup>V from Th(p,F) at E=800 MeV, followed by time-of-flight, isochronous spectrometer, deduced mass.

[1994KoZV](#): <sup>59</sup>Co(<sup>3</sup>He,X) E=11-92 MeV. Measured cross section.

[1998Am04](#): Fragmentation of <sup>86</sup>Kr beam with Be target. Measured isotopic half-life.

[1998So03](#): <sup>58</sup>V from <sup>9</sup>Be(<sup>65</sup>Cu,X) reaction at 64.5 MeV/nucleon. Measured  $\gamma$ ,  $\beta$ ,  $\beta\gamma$  coin, isotopic half-life.

[1999So20](#) (also [1999Le67](#)): <sup>58</sup>V from <sup>58</sup>Ni(<sup>86</sup>Kr,X) reaction at 60.4 MeV/nucleon. Measured E $\beta$ , I $\beta$ (t), isotopic half-life.

[2001Pr13](#) (also [2001Pr05](#)): Fragmentation of <sup>70</sup>Zn beam with Be target, measured  $\gamma$ ,  $\beta$ ,  $\beta\gamma$  coin, isotopic half-life.

[2003Ma02](#): Fragmentation of <sup>86</sup>Kr beam with Be target. Measured  $\gamma$ ,  $\beta$ ,  $\gamma\gamma$ ,  $\gamma\beta$  coin, isotopic half-life.

[2005Ga01](#) (also [2003So21](#)): <sup>58</sup>V produced in fragmentation of <sup>76</sup>Ge<sup>30+</sup> beam on a <sup>58</sup>Ni target. LISE3 achromatic spectrometer used to separate fragments; time-of-flight method, energy loss and magnetic rigidity used to identify fragments. Measured E $\gamma$ , I $\gamma$ , I $\beta$ ,  $\gamma\gamma$ ,  $\beta\gamma$  coin,  $\gamma$ (t), lifetimes with four Ge detectors placed around a thick Si telescope. Half-lives determined by fitting procedure involving five parameters: half-lives of mother, daughter and grand-daughter nuclei, the  $\beta$ -efficiency and the background rate over the 1 s collecting time.

[Additional information 1](#).

<sup>58</sup>V Levels

Cross Reference (XREF) Flags

**A** <sup>58</sup>Ti  $\beta^-$  decay (59 ms)

E(level)	J $^\pi$	T <sub>1/2</sub>	XREF	Comments
0.0	(1 <sup>+</sup> )	191 ms 10	<b>A</b>	$\% \beta^- = 100$ ; $\% \beta^- n = ?$ E(level): the 205-ms activity is assumed to belong to the g.s. of <sup>58</sup> V. J $^\pi$ : $\beta$ feeding of <38 7 to g.s. of <sup>58</sup> Cr in <sup>58</sup> V decay suggests 1 <sup>+</sup> or 0 <sup>+</sup> , the former being more likely from possible configuration= $\nu 1f_{5/2} \otimes \pi 1f_{7/2}$ . However, from shell model calculations, <a href="#">2005Ga01</a> predict 2 <sup>+</sup> for g.s. and 1 <sup>+</sup> as first excited state; strong 114 $\gamma$ may define a 1 <sup>+</sup> level in <sup>58</sup> V at this energy, in which case the ground state of <sup>58</sup> V may be 2 <sup>+</sup> . Although, the decay scheme of <sup>58</sup> V is not well established, 2 <sup>+</sup> seems unlikely in view of some evidence of $\beta$ feeding of g.s. of <sup>58</sup> Cr. See also discussions in <a href="#">2003Ma02</a> (also <a href="#">2004Li12</a> ) for discussion in favor of 1 <sup>+</sup> for g.s. of <sup>56</sup> V and <sup>58</sup> V. T <sub>1/2</sub> : weighted average of 185 ms 10 ( <a href="#">2003Ma02</a> ), 205 ms 20 ( <a href="#">1998So03</a> ), 0.20 s 2 ( <a href="#">1998Am04</a> ). Calculated delayed-neutron decay mode: $\% \beta^- n = 0.8$ ( <a href="#">1997Mo25</a> ).
114? 2			<b>A</b>	

$\gamma$ (<sup>58</sup>V)

E <sub>i</sub> (level)	E $_\gamma$	I $_\gamma$	E <sub>f</sub>	J $^\pi_f$	Comments
114?	114 <sup>†</sup> 2	100	0.0	(1 <sup>+</sup> )	E $_\gamma$ : A 114 2 $\gamma$ seen in <sup>58</sup> Ti decay is either a member of $\gamma$ -cascade from high-lying excited state in <sup>58</sup> V or corresponds to direct decay of a 114 level to the g.s. Since no other transition was observed, the latter possibility seems more likely. Other: 116 2 ( <a href="#">2002MaZN</a> ).

<sup>†</sup> Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: Relative photon branching from each level

-----►  $\gamma$  Decay (Uncertain)