## <sup>84</sup>Ga β<sup>-</sup>n decay (85 ms) 2010Wi03,2009Le26

		History	
Туре	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 125, 201 (2015)	31-Dec-2014

Parent: <sup>84</sup>Ga: E=0.0;  $J^{\pi}=(0^{-})$ ;  $T_{1/2}=85$  ms 10;  $Q(\beta^{-}n)=8440$  SY;  $\%\beta^{-}n$  decay=74 14

<sup>84</sup>Ga- $\%\beta^-$ n decay:  $\%\beta^-=100$ ;  $\%\beta^-$ n=74 *14* (2010Wi03). Other:  $\%\beta^-$ n=70 *15* (1991Kr15,2002Pf04).

2010Wi03 (also 2009Gr06, 2008WiZS): <sup>84</sup>Ga isotope produced in proton induced fission of <sup>238</sup>U with E(p)=54 MeV. Fission products passed through charge exchange cell, separated in the high-resolution injector magnet and re-accelerated to 225 MeV. Identification based on time-of-flight and energy loss. Measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$  and  $\beta\gamma$  coincidences using four HPGe clover detectors and two plastic scintillator detectors.

2009Le26 (also 2009Ve11): <sup>84</sup>Ga isotope produced in photofission of UC<sub>x</sub> target with a 50-MeV electron beam. Fission products ionized and magnetically mass separated. Measured E $\gamma$ , I $\gamma$ ,  $\beta\gamma$  coincidences using a coaxial HPGe detector, a small EXOGAM clover detector and a cylindrical plastic scintillator.

2006Pe20 (also 2007Ib01,2004Ve14,2003Pe18): <sup>84</sup>Ga isotope produced in fast neutron induced fission of <sup>238</sup>U. Fission products ionized and magnetically mass separated. Measured E $\gamma$ , I $\gamma$ ,  $\gamma\gamma$  and  $\beta\gamma$  coincidences using two large volume HPGe detectors and a  $4\pi$  plastic scintillator.

2009Le26 suggest the presence of an isomer in <sup>84</sup>Ga with half-life of <85 ms and  $J^{\pi}=(3^-,4^-)$ . This isomer may also decay by delayed- neutron emission, but no details of such a decay are known.

Level scheme is that of 2010Wi03. 2006Pe20 place a 867 $\gamma$  from a level at 867 keV. Such a transition is not reported by 2009Pe20 or 2010Wi03 in <sup>84</sup>Ga  $\beta^-$ n decay, and thus, the 867-keV level and  $\gamma$  ray are not adopted here. See also comments on <sup>83</sup>Ga  $\beta^-$  decay for additional discussion of the 867 $\gamma$  and 867-keV level. 2009Le26 report the 1046 $\gamma$  as belonging to the  $\beta^-$  decay of <sup>84</sup>Ga into <sup>84</sup>Ge and based on an intensity imbalance, suggest the presence of an isomer in <sup>84</sup>Ga with half-life of <85 ms and  $J^{\pi}=(3^-,4^-)$ . 2010Wi03 observe the 1046 $\gamma$  in both their <sup>83</sup>Ga and <sup>84</sup>Ga decay data, supporting its placement as a transition in <sup>83</sup>Ga.

#### <sup>83</sup>Ge Levels

E(level) <sup>†</sup>	$J^{\pi \ddagger}$
0 247.7 <i>3</i>	$(5/2)^+$ $1/2^+$
1046.0 6	

 $^{\dagger}$  From a least-squares fit to Ey, by evaluator.

<sup>‡</sup> From the Adopted Levels.

# $\gamma(^{83}\text{Ge})$

Iy normalization: From measured absolute intensity of  $248\gamma$ , Iy( $248\gamma$ )=8.6% 8 (2010Wi03).

$E_{\gamma}^{\dagger}$	$I_{\gamma}$ <sup>‡#</sup>	E <sub>i</sub> (level)	$\mathbf{J}_i^{\pi}$	$E_f$	$\mathbf{J}_{f}^{\pi}$	Comments
247.7 3	100 7	247.7	$1/2^{+}$	0	$(5/2)^+$	$E_{\gamma}$ : weighted average of 247.8 <i>3</i> (2009Le26) and 247.3 <i>5</i> (2010Wi03).
798.6 <i>10</i>	84	1046.0		247.7	$1/2^{+}$	
1045.9 7	48 7	1046.0		0	$(5/2)^+$	

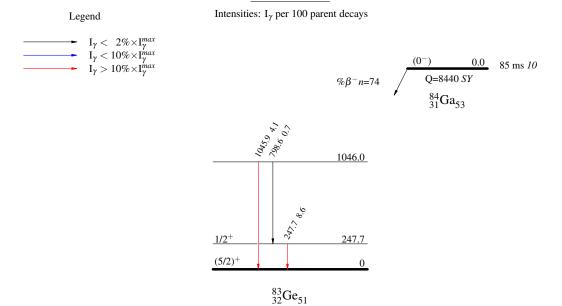
<sup>†</sup> From 2010Wi03, except where noted.

<sup>‡</sup> From 2010Wi03, normalized to  $I\gamma(248\gamma)=100$ .

<sup>#</sup> For absolute intensity per 100 decays, multiply by 0.086 *16*.

# <sup>84</sup>Ga $\beta^-$ n decay (85 ms) 2010Wi03,2009Le26

## Decay Scheme



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