^{83}Ga β^- decay (308.1 ms) 2010Wi03,2006Pe20

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

Parent: ^{83}Ga: E=0.0; $T_{1/2}$=308.1 ms *10*; Q(β^-)=11719 *4*; %β^- decay=100.0

^{83}Ga-%β^- decay: %β^-n=62.8 *25* (2009Wi03).

2010Wi03 (also 2009Gr06, 2008WiZZ): ^{83}Ga isotope produced in proton induced fission of ^{238}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 Eγ, Iγ, $\gamma\gamma$ and $\beta\gamma$ coincidences using four HPGe clover detectors and two plastic scintillator detectors.

2006Pe20 (also 2007Ib01,2004Ve14,2004PeZW thesis,2003Pe18): ^{83}Ga isotope produced by fast neutron fission of ^{238}U. Fission products ionized and magnetically mass separated. Measured Eγ, Iγ, $\gamma\gamma$ and $\beta\gamma$ coincidences using two large volume HPGe detectors and a 4π plastic scintillator.

Level scheme is that of 2010Wi03. 2006Pe20 report two γ rays belonging to the decay of ^{83}Ga into ^{83}Ge with energies of 867.4 *8* and 1238.2 *5* keV. 2010Wi03 use $\gamma\gamma$ coincidence data to show that the 867.4-keV γ-ray belongs to ^{82}Ge, populated in the β^-n decay of ^{83}Ga.

The decay scheme is very incomplete evidenced by the gap of nearly 10 MeV between the highest energy level observed and the decay Q value. The total energy release of 2.3 MeV *14* as calculated by the code RADLST is substantially smaller than the Q value of 11.7 MeV.

^{83}Ge Levels

E(level)[†]	J$^\pi$[‡]
0	(5/2)$^+$
247.05 *17*	1/2$^+$
1045.51 *19*	
1237.97 *13*	

[†] From Eγ.
[‡] From the Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†#]	Log *ft*[‡]	Comments
(10481 *4*)	1237.97	1.9 *1*	6.7 *1*	av Eβ=4900.9 *20*
(10673 *4*)	1045.51	0.65 *12*	7.2 *1*	av Eβ=4994.0 *20*
(11472 *4*)	247.05	0.43 *11*	7.6 *2*	av Eβ=5379.9 *20*
(11719 *4*)	0	<34	>5.7	av Eβ=5499.2 *20*

[†] From an intensity balance at each level, by evaluator. Should be considered upper limits, as the decay scheme is highly incomplete.
[‡] Should be considered lower limits, as the decay scheme is highly incomplete.
[#] Absolute intensity per 100 decays.

^{83}Ga β^- decay (308.1 ms) 2010Wi03,2006Pe20 (continued)

$\gamma(^{83}Ge)$

Iγ normalization: From measured absolute intensity of 1348γ, Iγ(1348γ)=28.4% *10* (2010Wi03). The 1348γ is observed in ^{82}Ge following the β^-n decay of ^{83}Ga.

E_γ [†]	I_γ [‡#]	E_i(level)	J_i^π	E_f	J_f^π	Comments
247.05 *17*	1.5 *4*	247.05	1/2$^+$	0	(5/2)$^+$	
1045.50 *19*	2.3 *4*	1045.51		0	(5/2)$^+$	
1237.96 *13*	6.7 *3*	1237.97		0	(5/2)$^+$	E_γ: other: 1238.2 *5* (2006Pe20).

[†] From 2010Wi03.
[‡] From 2010Wi03, normalized to Iγ(1348γ)=100. The 1348γ is observed in ^{82}Ge following the β^-n decay of ^{83}Ga.
[#] For absolute intensity per 100 decays, multiply by 0.284 *10*.

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Decay Scheme

Intensities: I_γ per 100 parent decays