^{84}Ga β^-n decay (85 ms) 2010Wi03,2009Le26

History

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

Parent: ^{84}Ga: E=0.0; J^π=(0$^-$); $T_{1/2}$=85 ms *10*; Q(β^-n)=8440 *SY*; %β^-n decay=74 *14*

^{84}Ga-%β^-n decay: %β^-=100; %β^-n=74 *14* (2010Wi03). Other: %β^-n=70 *15* (1991Kr15,2002Pf04).

2010Wi03 (also 2009Gr06, 2008WiZS): ^{84}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.

2009Le26 (also 2009Ve11): ^{84}Ga isotope produced in photofission of UC_x target with a 50-MeV electron beam. Fission products ionized and magnetically mass separated. Measured Eγ, Iγ, $\beta\gamma$ coincidences using a coaxial HPGe detector, a small EXOGAM clover detector and a cylindrical plastic scintillator.

2006Pe20 (also 2007Ib01,2004Ve14,2003Pe18): ^{84}Ga isotope produced in fast neutron induced 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.

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

^{83}Ge Levels

E(level)[†]	J^π[‡]
0	(5/2)$^+$
247.7 *3*	1/2$^+$
1046.0 *6*	

† From a least-squares fit to Eγ, by evaluator.
‡ From the Adopted Levels.

γ(^{83}Ge)

Iγ normalization: From measured absolute intensity of 248γ, Iγ(248γ)=8.6% *8* (2010Wi03).

E$_\gamma$[†]	I$_\gamma$[‡#]	E$_i$(level)	J^π_i	E$_f$	J^π_f	Comments
247.7 *3*	100 *7*	247.7	1/2$^+$	0	(5/2)$^+$	E$_\gamma$: weighted average of 247.8 *3* (2009Le26) and 247.3 *5* (2010Wi03).
798.6 *10*	8 *4*	1046.0		247.7	1/2$^+$	
1045.9 *7*	48 *7*	1046.0		0	(5/2)$^+$	

† From 2010Wi03, except where noted.
‡ From 2010Wi03, normalized to Iγ(248γ)=100.
# For absolute intensity per 100 decays, multiply by 0.086 *16*.

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Decay Scheme

Intensities: I_γ per 100 parent decays