^{84}Ga β^- decay: mixed source 2009LeZZ,2009Gr06,2008WiZZ

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	A. A. Sonzogni, M. Fadil, and B. Pfeiffer	NDS 110,2815 (2009)	30-Sep-2009

Parent: ^{84}Ga: E=0.0; J^π=(0$^-$); $T_{1/2}$=0.085 s *10*; Q(β^-)=13690 *SY*; %β^- decay=100.0

Parent: ^{84}Ga: E=0.0+x; J^π=(3$^-$,4$^-$); $T_{1/2}$<0.085 s; Q(β^-)=13690 *SY*; %β^- decay=100.0

^{84}Ga(0.0)-Q(β^-): 13690 *400* (syst,2009AuZZ). Other: 14140 *500* (syst,2003Au03).

^{84}Ga(0.0)-%β^- decay: %β^-=100, %β^-n=70 *15*.

^{84}Ga(0.0+x)-Q(β^-): 13690 *400* (syst,2009AuZZ). Other: 14140 *500* (syst,2003Au03).

^{84}Ga(0.0+x)-%β^- decay: %β^-=100, %β^-n=?

2009LeZZ: U(γ,F), E=50 MeV, fission fragments were mass separated and implanted on a tape system, measured γ, $\beta\gamma$. The authors of this work propose two levels for ^{84}Ga on the basis of the gamma intensities in ^{84}Ge β^- and ^{84}Ga β^-n decays, see the other two β^- decay datasets.

2009LeZZ is now published as Phys. Rev. C 80, 044308 (2009). The data in the published version are identical to those in preprint. Additional information 1.

2009Gr06: ^{238}U(p,F), E=54 MeV, fission fragments decay studied using ORNL′s Low-energy Radioactive Ion Beam Spectroscopy Station. Measured γ, $\gamma\beta$. Published gamma ray spectra looks far cleaner and with higher statistics than the corresponding one in 2009LeZZ.

2008WiZZ: ^{235}U(p,F), fission fragments implanted into a moving tape collector, measured γ, $\gamma\beta$ using four Ge clover detectors and two plastic scintillators.

2003Pe18: ^{84}Ga isotope produced by neutron-induced fission of ^{238}U followed by mass separation (isol method). Measured Eγ, $\gamma\gamma$, $\beta\gamma$ coin. In this article, a γ-ray of 820 keV was tentatively attributed to the 2$^+$ to 0$^+$ transition in ^{84}Ge. The half-life of this gamma ray was measured to be 65 ms *36*, which is in agreement with the 85 ms *10* adopted value. However, in 2006Pe20, a later article by the same authors of 2003Pe18, it is said that "no new γ-line was found as a candidate to the 2$^+$ to 0$^+$ in ^{84}Ge because of low statistics". As a result, the earlier 2003Pe18 result is not adopted. The works of 2008WiZZ, 2009Gr06 and 2009LeZZ put the 2$^+$ energy at 624 keV.

^{84}Ge Levels

E(level)	J^π	Comments
0.0	0$^+$	
624.1 *5*	(2$^+$)	
1389.2 *9*		J^π: assigned (4$^+$) in 2008WiZZ.
1670.2? *9*	(4$^+$)	E(level): level treated as tentative (evaluators) since $\gamma\gamma$ coin evidence for 1046-624 cascade is lacking. In reference 8 quoted by 2009LeZZ, one of the possible assignment of 1046γ is in ^{83}Ge nuclide from ^{84}Ga delayed neutron decay, although, this possibility is considered as less likely by 2009LeZZ.

γ(^{84}Ge)

Eγ	E$_i$(level)	J_i^π	E$_f$	J_f^π	Comments
624.1 *5*	624.1	(2$^+$)	0.0	0$^+$	Eγ: weighted average of 623.9 *6* (2008WiZZ) and 624.3 *7* (2009LeZZ), other: 624 (2009Gr06).
765.1 *8*	1389.2		624.1	(2$^+$)	Eγ: from 2008WiZZ, not observed by 2009LeZZ. Other: 765 (2009Gr06).
1046.1 *7*	1670.2?	(4$^+$)	624.1	(2$^+$)	Eγ: from 2009LeZZ. a gamma ray at 1045 keV is clearly seen by 2009Gr06, yet it was not placed in the decay scheme.

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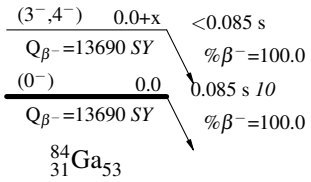
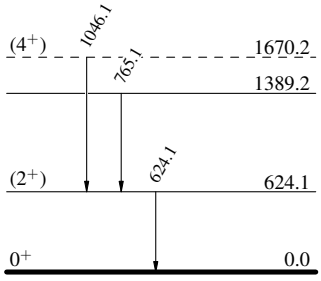
Decay Scheme



$^{84}_{31}Ga_{53}$



$^{84}_{32}Ge_{52}$