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

 83 Ga- $\%\beta^-$ decay: $\%\beta^-$ 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 E γ , I γ , $\gamma\gamma$ 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 E γ , I γ , $\gamma\gamma$ 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 ⁸³Ga into ⁸³Ge 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 ⁸²Ge, populated in the β ⁻n decay of ⁸³Ga.

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.

⁸³Ge Levels

| E(level) | J ^{π‡} |
|-------------------|-----------------|
| 0 | $(5/2)^+$ |
| 247.05 17 | $1/2^{+}$ |
| 1045.51 <i>19</i> | |
| 1237.97 13 | |

[†] From Eγ.

β^- radiations

| E(decay) | E(level) | Ιβ ^{-†#} | $\operatorname{Log} ft^{\ddagger}$ | | Comments | |
|-----------|----------|-------------------|------------------------------------|-------------------------|----------|--|
| (10481 4) | 1237.97 | 1.9 <i>I</i> | 6.7 1 | av E β =4900.9 20 | | |
| (10673 4) | 1045.51 | 0.65 12 | 7.2 1 | av E β =4994.0 20 | | |
| (11472 4) | 247.05 | 0.43 11 | 7.6 2 | av E β =5379.9 20 | | |
| (11719 4) | 0 | <34 | >5.7 | av E β =5499.2 20 | | |

[†] From an intensity balance at each level, by evaluator. Should be considered upper limits, as the decay scheme is highly incomplete.

[‡] From the Adopted Levels.

[‡] Should be considered lower limits, as the decay scheme is highly incomplete.

[#] Absolute intensity per 100 decays.

⁸³Ga β⁻ decay (308.1 ms) **2010Wi03,2006Pe20** (continued)

γ (83Ge)

Iy normalization: From measured absolute intensity of 1348γ , $I\gamma(1348\gamma)=28.4\%$ 10 (2010Wi03). The 1348γ is observed in 82 Ge following the β^- n decay of 83 Ga.

| $\mathrm{E}_{\gamma}^{\dagger}$ | I_{γ} ^{‡#} | $E_i(level)$ | \mathbf{J}_i^{π} | \mathbf{E}_f | \mathbf{J}_f^{π} | Comments |
|---------------------------------|----------------------------|--------------|----------------------|----------------|----------------------|---------------------------------------|
| 247.05 17 | 1.5 4 | 247.05 | 1/2+ | 0 | $(5/2)^{+}$ | |
| 1045.50 <i>19</i> | 2.3 4 | 1045.51 | | 0 | $(5/2)^+$ | |
| 1237.96 <i>13</i> | 6.7 3 | 1237.97 | | 0 | $(5/2)^+$ | E_{v} : other: 1238.2 5 (2006Pe20). |

[†] From 2010Wi03.

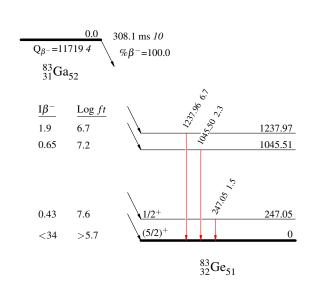
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Decay Scheme

Intensities: I_{γ} per 100 parent decays

 $I_{\gamma} < 2\% \times I_{\gamma}^{max}$ $I_{\gamma} < 10\% \times I_{\gamma}^{max}$ $I_{\alpha} > 10\% \times I_{\alpha}^{max}$

Legend



[‡] From 2010Wi03, normalized to $I\gamma(1348\gamma)=100$. The 1348 γ is observed in ⁸²Ge following the β^- n decay of ⁸³Ga.

[#] For absolute intensity per 100 decays, multiply by 0.284 10.