

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 116, 1 (2014)	31-Dec-2013

$Q(\beta^-)=13060$ SY; $S(n)=3850$ SY; $S(p)=14940$ SY; $Q(\alpha)=-10700$ SY [2012Wa38](#)

$Q(\beta^-)$ and $S(n)$ from [2012Wa38](#); $S(p)$ and $Q(\alpha)$ from [1997Mo25](#).

Estimated uncertainties ([2012Wa38](#)): $\Delta Q(\beta^-)=300$, $\Delta S(n)=500$, $\Delta S(p)=670$, $\Delta Q(\alpha)=850$.

$S(2n)=6950$ 300, $Q(\beta^-n)=10010$ 300 (syst,[2012Wa38](#)). $S(2p)=33830$ (theory,[1997Mo25](#)).

[1997Be70](#): identification in $\text{Pb}(^{238}\text{U},\text{F})$ $E=750$ MeV/nucleon; time-of-flight.

[2010Wi03](#): ^{85}Ga from $^{238}\text{U}(p,\text{F})$, $E=54$ MeV; products were accelerated to 225 MeV in the ORNL Tandem. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$, (fragment) γ coin (ion-tagged γ -ray spectra), $\beta\gamma$ (ion) coin, $\beta n\gamma$ coin using an array composed of four Ge clover and two plastic scintillator detectors. Comparison with spherical HFB calculations. See also [2009Gr06](#) and [2008WiZS](#) (conference articles) from the same group.

[2012Ma37](#): ^{85}Ga produced in fission of U with 50 MeV proton beam. Target= 6 g/cm^2 thick UC_x located at target ion source assembly mounted on the Injector for Radioactive Ion Species 2 (IRIS-2) at HRIBF facility at ORNL. Fission products were separated by electromagnetic system. Separated ions were transmitted to Low energy Radioactive Ion beam Spectroscopy Station (LeRIBSS). Ions at 200 keV energy were deposited on a tape in the Moving Tape Collector located in the middle of β - γ counting system consisting of four Ge Clovers and two plastic scintillators. Measured β -gated γ spectra and half-lives. Half-life of isotope was measured by fitting the growth and decay curves of γ rays assigned to β - γ or $\beta\gamma$ -neutron channels after subtraction of background. Comparison with theoretical calculations using density functional model.

[2013Mi19](#): proton beam was provided by the Oak Ridge Isochronous Cyclotron (ORIC) at the HRIBF-ORNL facility. Target= UC_x . Mass analyzed ions of ^{85}Ga were extracted using Resonant Ionization Laser Ion Source (RILIS). Pure ^{85}Ga beam was then sent to the Low-energy Radioactive Ion Beam Spectroscopy Station (LeRIBSS) and implanted in a moving tape collector (MTC). Measured $E\gamma$, $I\gamma$, $E\beta$, $\beta\gamma$ -coin, $n\gamma$ -coin, half-life of ^{85}Ga , using two HPGe Clover detectors, two plastic scintillation counters for β , and an array of 48 ^3He ionization chambers for neutron detection. Gamma ray assigned to β^-n decay of ^{85}Ga to ^{84}Ge : 624.3 keV. A γ ray at 107.8 keV is assigned to decay of ^{85}Ga ([2012Ma37](#)).

[Additional information 1](#).

 ^{85}Ga Levels

<u>E(level)</u>	<u>J^π</u>	<u>$T_{1/2}$</u>	<u>Comments</u>
0	($5/2^-$)	92 ms 4	<p>$\% \beta^- = 100$; $\% \beta^- n > 35$ (2009Gr06)</p> <p>Delayed-neutron is expected to be the dominant decay mode as suggested by the observation of a strong 624γ in ^{84}Ge, and from theoretical values of $\% \beta^- n = 94$, $\% \beta^- 2n = 6$ (1997Mo25); total delayed-neutron decay = 100% (2005Bo19).</p> <p>E(level): it is assumed that the observed ^{85}Ga fragments are associated with the g.s.</p> <p>J^π: proposed in 2013Ko31 based on systematics of neighboring Ga nuclei, and agreement of experimental and theoretical half-lives from CQRPA calculations; probable $f_{5/2}$ orbital. Others: $3/2^-$ (syst,2012Au07), $1/2^-$ (predicted,1997Mo25).</p> <p>$T_{1/2}$: measured value from decay curves of five γ rays (2013Mi19). Others: 93 ms 7 (2012Ma37), from gates on 107.8- and 624.3-keV γ rays from decay of ^{85}Ga, <100 ms, estimated in 2010Wi03 from observation of events due to 624-keV γ ray (in ^{84}Ge from delayed neutron decay of ^{85}Ga) in the first 190 ms after implantation.</p>