82 Zn β^{-} n decay (166 ms) 2016Al10

History					
Туре	Author	Citation	Literature Cutoff Date		
Full Evaluation	M. Shamsuzzoha Basunia	NDS 199,271 (2025)	1-Sep-2024		

Parent: ⁸²Zn: E=0.0; $J^{\pi}=0^+$; $T_{1/2}=166$ ms 11; $Q(\beta^-n)=7243$ 4; $\%\beta^-n$ decay=69 7

⁸²Zn-T_{1/2}: From ⁸²Zn Adopted Level in the ENSDF.

⁸²Zn-Q(β^{-} n): From 2021Wa16.

⁸²Zn-% β ⁻n decay: % β ⁻n=69 7 for ⁸²Zn decay (2016A110). Same value in ⁸²Zn Adopted Levels in the ENSDF.

Adapted/Edited XUNDL dataset compiled by B. Singh (McMaster), K. Banerjee and T. Roy (VECC), Oct 8, 2016.

2016A110: ⁸²Zn produced in the fission of ²³⁸UC_x target of 6 g/cm² thickness by a 50 MeV, 10-18 μ A proton beam from the Holifield Radioactive Ion beam facility (HRIBF) at Oak Ridge National Laboratory, followed by a two-step high-resolution mass separation.

The radioactive ion beam was transmitted to the Low-energy Radioactive Ion Beam Spectroscopy Station (LeRIBSS), then implanted on a moving tape collector (MTC) surrounded by four HPGe detectors for γ rays and two plastic scintillators for β detection. The counting cycle was four seconds implantation of ion beam on the tape, followed by two seconds of decay measurement, while the ion beam was deflected away. After the decay measurement, the MTC system transported the samples 50 cm away from the γ and β detector system.

Measured E γ , I γ , $\beta\gamma$ -coin, $\gamma\gamma$ -coin, half-life of ⁸²Zn decay, and $\%\beta^-$ n. Deduced level scheme of ⁸¹Ga, β feedings and log *ft* values.

⁸¹Ga Levels

E(level) [†]	$J^{\pi \ddagger}$	T _{1/2} ‡
0.0	$5/2^{(-)}$	1.219 s 5
350.8 <i>1</i>	$(3/2^{-})$	60 ps 10
802.3 <i>3</i>	$(3/2^{-})$	23 ps 16

[†] From $E\gamma$.

[‡] From Adopted Levels.

$\gamma(^{81}\text{Ga})$

Iv normalization: from $I\gamma(350.8)=39$ 7 (delayed neutron intensities of 34 7 and 5 2 feeding the 350.8 and 802.3 keV levels, respectively).

Eγ	I_{γ}^{\dagger}	E_i (level)	\mathbf{J}_i^{π}	E_f	\mathbf{J}_f^{π}
350.8 <i>1</i>	100.0 5	350.8	$(3/2^{-})$	0.0	5/2 ⁽⁻⁾
451.5 <i>3</i>	13.0 49	802.3	$(3/2^{-})$	350.8	$(3/2^{-})$

[†] For absolute intensity per 100 decays, multiply by 0.39 7.

Delayed Neutrons (81Ga)

Particle normalization: Absolute feedings are given in 2016Al10.

E(⁸¹ Ga)	$I(n)^{\dagger\ddagger}$
0.0	30 6
350.8	34 7
802.3	52

82 Zn β^- n decay (166 ms) 2016Al10 (continued)

Delayed Neutrons (81Ga) (continued)

[†] From $\% I_{\beta}$ in Fig. 7 in 2016A110, based on the analysis of ⁸²Zn β^- n decay to ⁸¹Ga and β^- decay of ⁸¹Ga to ⁸¹Ge. [‡] Absolute intensity per 100 decays.

⁸²Zn β^- n decay (166 ms) 2016Al10

