^{83}Zn β^-n decay 2016Al10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne	NDS 157, 260 (2019)	1-Mar-2019

Parent: ^{83}Zn: E=0.0; $J^\pi=5/2^+$; $T_{1/2}$=122 ms *28*; Q(β^-n)=8569 *SY*; %β^-n decay>0.0

^{83}Zn-$T_{1/2}$: Measured by 2016Al10 from growth and decay curve for β-gated 109γ transition. This value can be compared with 117 ms *20* from 2012Ma37, a previous measurement, also by the same experimental group as 2016Al10.

^{83}Zn-J^π: $5/2^+$ given in Fig. 10 of 2016Al10 is probably from systematics.

^{83}Zn-Q(β^-n): From 2017Wa10. ΔQ(β-n)=300 SY (2017Wa10).

^{83}Zn-%β^-n decay: %β^-n for ^{83}Zn decay is unknown, but observation of 141γ shows that the decay mode occurs.

Based on XUNDL. Compiled by S. Utyenkov and I. Kurhuz (NSC-KIPT, Kharkiv), J.K. Tuli (NNDC, BNL), and B. Singh (McMaster), August 26, 2016.

2016Al10: ^{83}Zn produced in the fission of $^{238}UC_x$ target of 6 g/cm^2 thickness by a 50 MeV, proton beam from the Holifield Radioactive Ion beam facility (HRIBF) at Oak Ridge National Laboratory, followed by a two-step high-resolution mass separation. Measured γ, β, half-life of ^{83}Zn decay; four HPGe detectors for γ rays and two plastic scintillators for β detection.

^{82}Ga Levels

E(level)	J^π	$T_{1/2}$	Comments
0	(2^-)		J^π: From Adopted Levels. 2016Al10 assign firm 2^- by citing the laser spectroscopy work of 2012Ch51 but evaluators note that the assignment of J=2 was tentative in this work, while J=1 and 3 were not totally ruled out, and that the parity is based only from a comparison of measured magnetic moment with shell-model predictions.
141 *1*	(4^-)	89 ns *9*	J^π: possible E2 γ to (2^-) g.s.; no β feeding from ^{82}Zn 0^+ parent. $T_{1/2}$: measured by 2016Al10. No details are provided but the measurement is probably from delayed coincidence data. This value is compared to 98 ns *+10−9* from 2012Ka36 (Phys. Rev. C86, 054319).

$\gamma(^{82}Ga)$

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
141 *1*	141	(4^-)	0	(2^-)	[E2]	Mult.: E2 consistent with level half-life (2016Ma10).

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Decay Scheme