

Adopted Levels, Gammas

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Balraj Singh	ENSDF	20-Mar-2016

$Q(\beta^-)=10030$ SY; $S(n)=5500$ SY; $S(p)=17630$ CA; $Q(\alpha)=-12880$ SY [2012Wa38,1997Mo25](#)

Estimated uncertainties ([2012Wa38](#)): $\Delta Q^- = 670$, $\Delta S(n) = 780$, $\Delta Q(\alpha) = 840$.

$S(p)$ from [1997Mo25](#), others from [2012Wa38](#).

$S(2n)=9000$ 780, $Q(\beta^-n)=5640$ 630 (both from syst, [2012Wa38](#)). $S(2p)=32980$ (theory, [1997Mo25](#)).

[2010Oh02](#): ^{128}Pd nuclide identified in $\text{Be}(^{238}\text{U},\text{F})$ and $\text{Pb}(^{238}\text{U},\text{F})$ reactions with a $^{238}\text{U}^{86+}$ beam energy of 345 MeV/nucleon produced by the cascade operation of the RIBF accelerator complex of the linear accelerator RILAC and four cyclotrons RRC, fRC, IRC and SRC. Identification of ^{128}Pd nuclei was made on the basis of magnetic rigidity, time-of-flight and energy loss of the fragments using BigRIPS fragment separator. Experiments performed at RIKEN facility.

Based on A/Q spectrum and Z versus A/Q plot, 13 counts were assigned to ^{128}Pd isotope. (Q=charge state).

[2015Lo04](#): ^{128}Pd nuclide produced at RIBF-RIKEN facility in $^9\text{Be}(^{238}\text{U},\text{F})$ reaction at $E=345$ MeV/nucleon with an average intensity of 6×10^{10} ions/s. Identification of ^{128}Pd was made by determining atomic Z and mass-to-charge ratio A/Q, where Q=charge state of the ions. The selectivity of ions was based on magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted at a rate of 50 ions/s in a stack of eight double-sided silicon-strip detector (WAS3ABi), surrounded by EURICA array of 84 HPGe detectors. Correlations were recorded between the implanted ions and β rays. The half-life of ^{128}Pd isotope was measured from the correlated ion- β decay curves and maximum likelihood analysis technique as described in [2014Xu07](#). Comparison of measured half-lives with FRDM+QRPA, KTUY+GT2 and DF3+QORPA theoretical calculations.

Structure calculations:

[2015Wa07](#), [2014Wa21](#): calculated levels, J, π , B(E2), energies and B(E2) of the first 2^+ state.

[Additional information 1](#).

[2009Mi25](#): Calculated β -decay half-life, G-T strength functions.

[2009Ti04](#): Calculated energies of 2^+ and 3^- states, B(E2) and ISGMR.

[2008Se01](#): Calculated energy of first 2^+ state, B(E2).

[2007Cu03](#): Calculated β -decay half-life, Q value, $\% \beta^-n$, G-T strength functions, $S(2n)$.

[2005Pa71](#), [2003Bo06](#), [2003Br19](#), [2003Mo09](#), [1988KrZR](#): Calculated β -decay half-life.

[2002Ma44](#): Calculated β -decay half-life, G-T strength functions.

[2001Ma56](#), [1999Ma88](#): Calculated β -decay half-life, $\% \beta^-n$.

 ^{128}Pd LevelsCross Reference (XREF) Flags

A ^{128}Pd IT decay (5.8 μs)

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
0	0 ⁺	35 ms 3	A	$\% \beta^- = 100$; $\% \beta^- n = ?$ Theoretical $T_{1/2} = 74.2$ ms, $\% \beta^- n = 6.7$ (2003Mo09). Measured $\sigma = 12$ pb (2010Oh02), systematic uncertainty $\approx 40\%$. Probability of misidentification of ^{128}Pd isotope $< 0.001\%$ (2010Oh02). $T_{1/2}$: measured by 2015Lo04 from (implanted ions) β correlated curves in time and position using maximum likelihood method. See 2015Lo04 for comparison of their experimental value with theoretical values.
1311.4 5	(2 ⁺)		A	
1815.8 7	(4 ⁺)		A	
2075.9 9	(6 ⁺)		A	
2151.0 10	(8 ⁺)	5.8 μs 8	A	$\% \text{IT} = 100$ $T_{1/2}$: from $75\gamma(t)$ relative to the beam implantation (2013Wa24).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{128}Pd Levels (continued)

[†] From E_γ data, assuming 0.5 keV uncertainty for each γ ray.

[‡] As proposed by [2013Wa24](#), based on systematics of even-even and neighboring nuclides.

γ(^{128}Pd)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^\dagger	Comments
1311.4	(2 ⁺)	1311.4	100	0	0 ⁺			
1815.8	(4 ⁺)	504.4	100	1311.4	(2 ⁺)			
2075.9	(6 ⁺)	260.1	100	1815.8	(4 ⁺)	[E2]	0.0478	$\alpha(\text{K})=0.0406\ 6$; $\alpha(\text{L})=0.00590\ 9$; $\alpha(\text{M})=0.001118\ 16$; $\alpha(\text{N})=0.000182\ 3$
2151.0	(8 ⁺)	75.1	100	2075.9	(6 ⁺)	[E2]	3.88	$\alpha(\text{K})=2.78\ 4$; $\alpha(\text{L})=0.897\ 13$; $\alpha(\text{M})=0.1745\ 25$; $\alpha(\text{N})=0.0269\ 4$ $\text{B}(\text{E}2)(\text{W.u.})=0.22\ 4$

[†] From BrIcc v2.3 (29-Mar-2013) [2008Ki07](#), “Frozen Orbitals” appr.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

