

^{117}Ru IT decay (2.487 μs) [2012Ka36](#),[2012LaZT](#),[2007To23](#)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Jul-2015

Parent: ^{117}Ru : E=185.0 4; $T_{1/2}$ =2.487 μs +58–55; %IT decay=100.0

Isomer produced in $^9\text{Be}(^{238}\text{U},\text{F})$, E=345 MeV/nucleon reaction.

[2012Ka36](#): ^{238}U beam at E=345 MeV/nucleon provided by the RIBF accelerator complex at RIKEN facility. Fission fragments were separated and analyzed by BigRIPS separator, transported to focal plane of ZeroDegree spectrometer and finally implanted in an aluminum stopper. Particle identification was achieved by ΔE -tof-B ρ method. Delayed gamma rays from microsecond isomers were detected by three clover-type HPGe detectors. Measured E_γ , I_γ , $\gamma\gamma$ -coin, isomer half-life. Deduced levels.

[2012LaZT](#): $^9\text{Be}(^{238}\text{U},\text{F})$ =750 MeV/nucleon; target=1 g/cm² of ^9Be ; Detectors: FRS, comprising four dipole magnets, multiwire chambers, scintillator detectors, ionization chamber at GSI. RISING multidetector array consisting of 105 HPGe detectors arranged in 15 Cluster detectors; Measured: E_γ , I_γ , $\gamma(t)$, isomer half-life; deduced J^π , single-particle configurations. Only the 184-keV γ reported in this work.

[2007To23](#), [2006ToZW](#): isomer in ^{117}Ru observed in fragmentation of 120 MeV/nucleon ^{136}Xe beam and using Beta Counting System at NSCL-MSU facility. Only one γ ray at 184.4 keV 2 ([2006ToZW](#)) is observed, and its decay curve gives $T_{1/2}$ =1.4 μs 6.

 ^{117}Ru Levels

E(level)	$T_{1/2}$	Comments
0.0		J^π : 1/2 ⁺ with configuration= $\nu 1/2[400]$ proposed in 2012LaZT .
57.7 4		
102.7? 4		E(level): reverse ordering of the 82.5-102.9 γ cascade is also possible, which will give a level at 82.5 keV instead of that at 102.7 keV.
185.0 4	2.487 μs +58–55	J^π : 1/2 [–] with configuration= $\nu 1/2[541]$ proposed in 2012LaZT . Number of implanted fragments= 3.1×10^5 . $T_{1/2}$: from $\gamma(t)$ method (2012Ka36). Others: 2.0 μs 3 (2012LaZT), 1.4 μs 6 (2006ToZW).

 $\gamma(^{117}\text{Ru})$

E_γ †	I_γ †@	$E_i(\text{level})$	E_f	Mult.	α &	Comments
57.8 5	3.9 4	57.7	0.0	(E1)	0.67	Mult.: assignment by the evaluator from intensity balance arguments.
82.5# 5	28 1	185.0	102.7?	(E1) ‡	0.242 5	
102.9# 5	27 1	102.7?	0.0	(D) ‡	0.21 8	α : overlaps E1 and M1.
127.4 5	5.1 5	185.0	57.7	[D,E2]	0.31 24	Mult.: assumed by the evaluator. α : overlaps E1, M1 and E2.
184.6 5	100 2	185.0	0.0	(D,E2) ‡	0.084 60	Additional information 1 . Mult.: from 2012Ka36 based on Weisskopf estimates. Other: E1 assigned by 2012LaZT based on systematics of hindrance factors, which seem to rule out M2. α : overlaps E1, M1 and E2.

† From [2012Ka36](#).

‡ From [2012Ka36](#), based on consideration of Weisskopf estimates and intensity balances. See also [2012LaZT](#) for possible E1 assignment for 184-keV transition; [2006ToZW](#) propose E2.

Reverse ordering of the 82.5-102.9 γ cascade is also possible.

@ For absolute intensity per 100 decays, multiply by 0.67 3.

& Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

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