^{9}Be(^{238}U,Fγ) 2012Ka36,2011Su11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	10-Jun-2015

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-Bρ method. Delayed gamma rays from microsecond isomers were detected by three clover-type HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, isomer half-life. Deduced levels, J, π. Comparison with previous studies. 2012Ka36 mention that more details will be given in a separate paper.

2011Su11: Produced at the radioactive isotope beam factory (RIBF) of the RIKEN Nishina Center via the in-flight fission of ^{238}U beams having an energy of 345 MeV/nucleon. Used 3 mm thick Be production target and BigRIPS Iγ-beam separator to separate the fission fragments. Beam particles identified using the magnetic rigidity, Bρ, time-of-flight, and energy loss which was determined by the focal plane detectors of BigRIPS and the ZeroDegree spectrometer. Identified particles were implanted in nine stacked double-sided silicon strip detectors (DSSD) surrounded by two $LaBr_3$ detectors and four Compton-suppressed clover-type Ge detectors each having a plastic scintillation detector in front to eliminate background in γ-ray spectrum caused by β-ray events by taking an anticoincidence. β-decay events selected using position and time correlations between implantation and β-ray events. Gamma rays of 174, 279, 348, 478, and 606 keV reported in 2011Su11.

2013Su08: superseded by 2012Ka36 and 2011Su11.

All data are from 2012Ka36.

^{108}Zr Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0.0[#]	0$^+$		
174.3[#] *5*	(2$^+$)		
521.5[#] *6*	(4$^+$)		
604.1 *5*			
947.6 *6*			
1000.1[#] *7*	(6$^+$)		
1432.5 *6*			
1642.3[#] *8*	(8$^+$)		
1796.4 *7*			
2074.5 *8*	(6$^+$)	0.536 μs *+26−25*	Number of implanted fragments=1.5×10^5 (2012Ka36). T$_{1/2}$: from γ(t) (2012Ka36). Other: 0.62 μs *15* (2011Su11).

[†] From least-squares fit to Eγ data.
[‡] As assigned by 2012Ka36, based on ground-state band members.
[#] Band(A): The g.s. band.

γ(^{108}Zr)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
174.4 *5*	100 *8*	174.3	(2$^+$)	0.0	0$^+$	Additional information 1.
277.9 *5*	37 *6*	2074.5	(6$^+$)	1796.4		Additional information 5.
347.2 *5*	40 *6*	521.5	(4$^+$)	174.3	(2$^+$)	Additional information 2.
364.2 *5*	25 *6*	1796.4		1432.5		
426.3 *5*	47 *7*	947.6		521.5	(4$^+$)	
432.3 *5*	22 *6*	2074.5	(6$^+$)	1642.3	(8$^+$)	
478.3 *5*	33 *7*	1000.1	(6$^+$)	521.5	(4$^+$)	Additional information 4.
485.3 *5*	15 *5*	1432.5		947.6		
603.9 *5*	50 *9*	604.1		0.0	0$^+$	Additional information 3.
642.3 *5*	22 *6*	1642.3	(8$^+$)	1000.1	(6$^+$)	

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^{9}Be(^{238}U,Fγ) 2012Ka36,2011Su11 (continued)

γ(^{108}Zr) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π
773.6 *5*	21 *7*	947.6		174.3	(2^+)
795.9 *5*	14 *5*	1796.4		1000.1	(6^+)
828.3 *5*	22 *8*	1432.5		604.1	

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Level Scheme

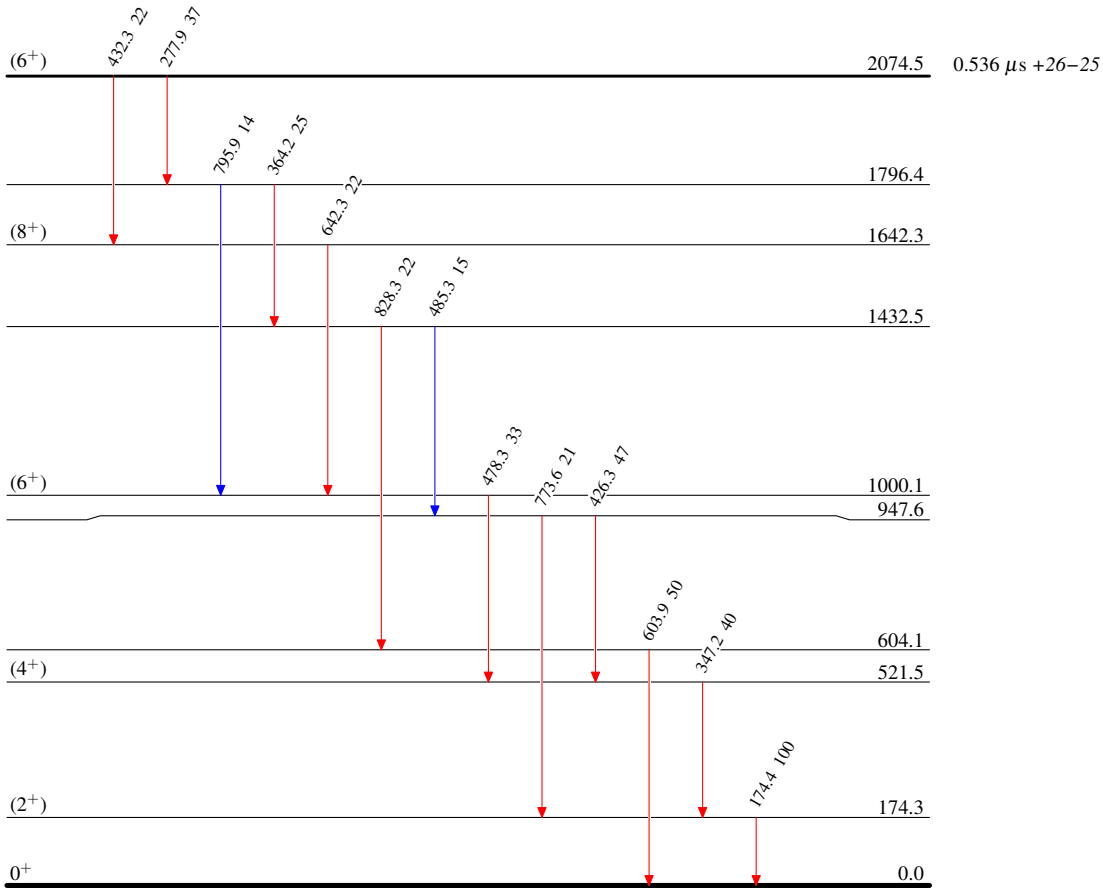
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{108}_{40}Zr_{68}$

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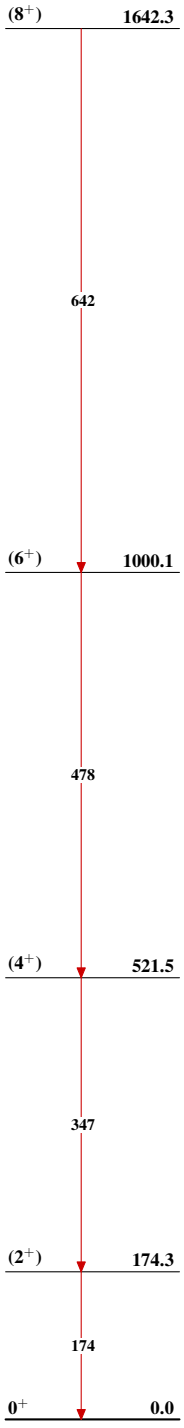
Band(A): The g.s. band



$^{108}_{40}Zr_{68}$