Adopted Levels, Gammas

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

Q(β^-)=8190 *SY*; S(n)=5160 *SY*; S(p)=16280 *SY*; Q(α)=−9670 *SY* 2012Wa38
Estimated uncertainties (2012Wa38): 400 for Q(β^-), 500 for S(n), 640 for S(p), 500 for Q(α).
Q(β^-n)=4300 *400*, S(2n)=8590 *450*, S(2p)=31140 *720* (syst,2012Wa38).
1997Be70, 1995CzZZ: ^{108Zr} was produced by the in-flight fission of ^{238}U ions at 750 MeV/nucleon impinging on a 1.2 g/cm^2 thick Be target at GSI facility.
2008Be33: ^{108Zr} formed in reaction Be(^{136}Xe,F) with E=1 GeV/nucleon at GSI facility. Effective thickness of target: 2.5 g/cm^2. Products identified in-flight by using the Fragment Separator (FRS). Measured cross section, σ=61 pb *22*.
2011Ni01: ^{108}Zr nuclide produced in Be(^{238}U,F) reactions at E=345 MeV/nucleon produced by the cascade operation of the RBIF complex of accelerators at RIKEN. Target=550 mg/cm^2. Identification of ^{108}Zr made on the basis of magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted in a nine-layer double-sided silicon-strip detector (DSSSD). Correlations were recorded between the heavy ions and β rays. The half-life of ^{108}Zr isotope was measured from the correlated ion-β decay curves and maximum likelihood analysis technique. In the analysis of the decay curve, β-detection efficiency, background rate, daughter and granddaughter (including those populated in delayed neutron decays) half-lives, and β-delayed neutron emission probabilities were considered. Comparison of measured half-lives with FRDM+QRPA and KTUY+GT2 calculations.
2011Su11: excited states and γ rays from the decay of ^{108}Y decay studied in this work.
2015Lo04: ^{108}Zr nuclide produced at RIBF-RIKEN facility in ^{9}Be(^{238}U,F) reaction at E=345 MeV/nucleon with an average intensity of 6×10^{10} ions/s. Identification of ^{108}Zr 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 ^{108}Zr 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+CQRPA theoretical calculations.

Theoretical Structure calculations:
2012Sh05: levels, J, π, configurations, shapes, and deformation parameters.
2012Ta16: levels, J, π, energy spectra of tetrahedral deformation, moment of inertia.
Additional information 1.

^{108}Zr Levels

Cross Reference (XREF) Flags

A ^{108}Y β^- decay (30 ms)
B ^{9}Be(^{238}U,Fγ)

E(level)	J$^\pi$[†]	T$_{1/2}$	XREF	Comments
0.0[‡]	0$^+$	77.4 ms *22*	AB	%β^-=100; %β^-n=? Theoretical %β^-n=1.96 (2003Mo09). T$_{1/2}$: weighted average of 78.5 ms *20* (2015Lo04, 785 ms *2* in Table I of 2015Lo04 is a misprint, as confirmed in an e-mail reply of June 11, 2015 from G. Lorusso) and 73 ms *4* (2011Ni01); from the analysis of the (ion)β-correlated decay curve.
174.3[‡] *5*	(2$^+$)		AB	
521.5[‡] *6*	(4$^+$)		AB	
604.1 *5*	(1,2$^+$)		B	J$^\pi$: γ to 0$^+$.
947.6 *6*	(2$^+$,3,4$^+$)		B	J$^\pi$: γs to (2$^+$) and (4$^+$).
1000.1[‡] *7*	(6$^+$)		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{108}Zr Levels (continued)

E(level)	J$^{\pi}$[†]	$T_{1/2}$	XREF	Comments
1432.5 *6*			B	
1642.3[‡] *8*	(8$^+$)		B	
1796.4 *7*			B	J$^{\pi}$: γ to (6$^+$) suggests (6,7,8$^+$).
2074.5 *8*	(6$^+$)	0.536 μs *+26−25*	B	%IT=100 J$^{\pi}$: γ to (8$^+$). $T_{1/2}$: from γ(t) (2012Ka36). Other: 0.62 μs *15* (2011Su11).

[†] From assignment as ground-state band members.
[‡] Band(A): The g.s. band.

γ(^{108}Zr)

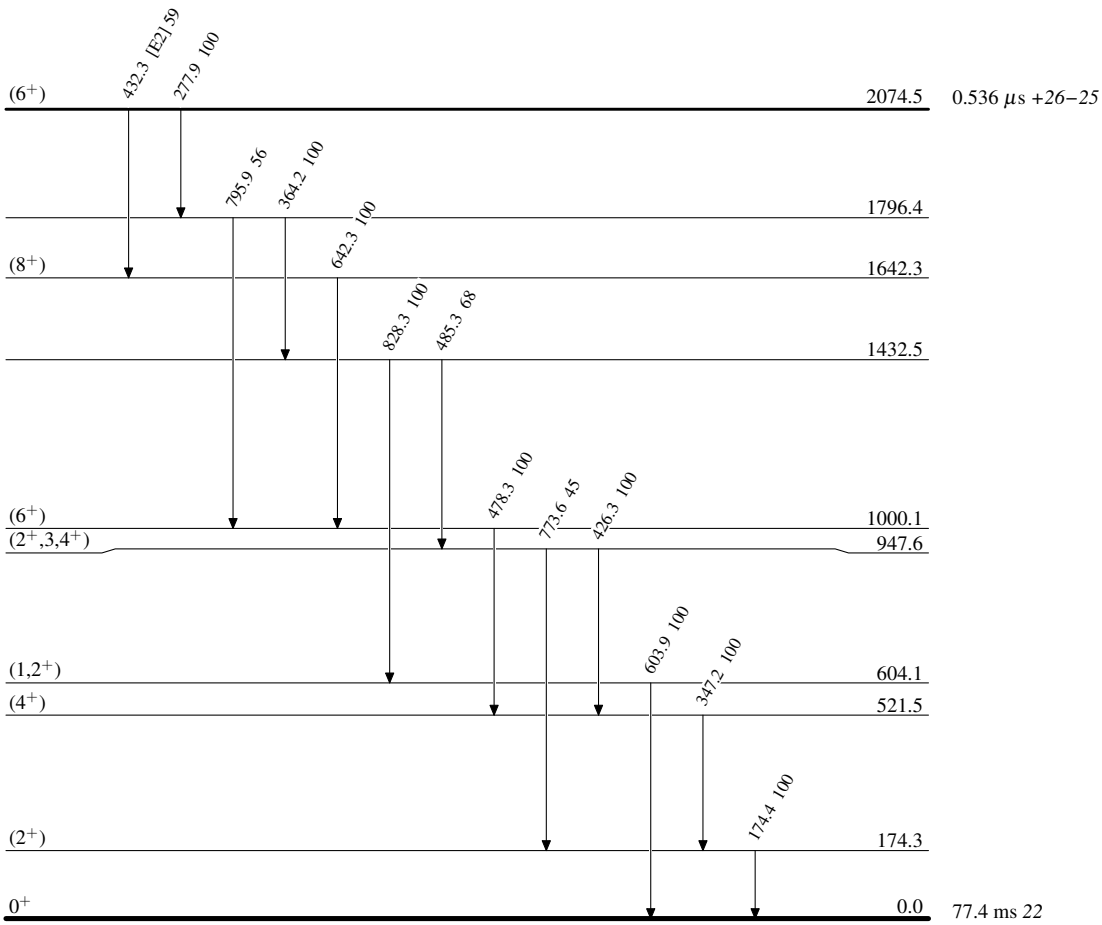
E_i(level)	J_i^{π}	E_{γ}[†]	I_{γ}[†]	E_f	J_f^{π}	Mult.
174.3	(2$^+$)	174.4 *5*	100	0.0	0$^+$	
521.5	(4$^+$)	347.2 *5*	100	174.3	(2$^+$)	
604.1	(1,2$^+$)	603.9 *5*	100	0.0	0$^+$	
947.6	(2$^+$,3,4$^+$)	426.3 *5*	100 *15*	521.5	(4$^+$)	
		773.6 *5*	45 *15*	174.3	(2$^+$)	
1000.1	(6$^+$)	478.3 *5*	100	521.5	(4$^+$)	
1432.5		485.3 *5*	68 *23*	947.6	(2$^+$,3,4$^+$)	
		828.3 *5*	100 *36*	604.1	(1,2$^+$)	
1642.3	(8$^+$)	642.3 *5*	100	1000.1	(6$^+$)	
1796.4		364.2 *5*	100 *24*	1432.5		
		795.9 *5*	56 *20*	1000.1	(6$^+$)	
2074.5	(6$^+$)	277.9 *5*	100 *16*	1796.4		
		432.3 *5*	59 *16*	1642.3	(8$^+$)	[E2]

[†] From ^{9}Be(^{238}U,Fγ).

Adopted Levels, Gammas

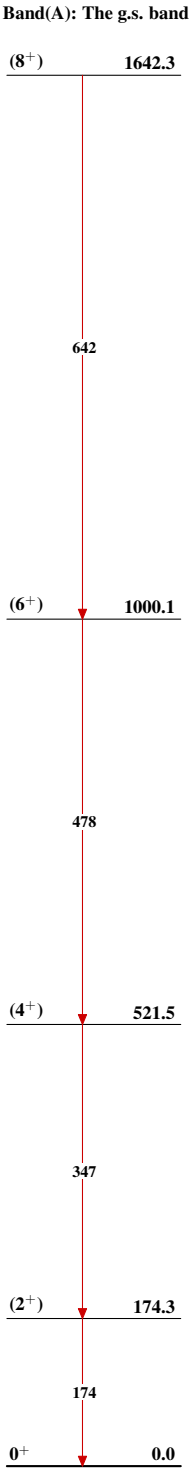
Level Scheme

Intensities: Relative photon branching from each level



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

Adopted Levels, Gammas



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