^{73}Ge(^{16}O,3nγ) 2020Bu08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	A. Negret and B. Singh	NDS 203,283 (2025)	20-Jan-2025

Dataset adapted from a dataset in the XUNDL database compiled by E.A. McCutchan (NNDC, BNL), Dec 30, 2020, from 2020Bu08.

2020Bu08: E(^{16}O)=57 MeV incident on 0.4-mg/cm^2 target with 95.6% enrichment deposited on a 3-mg/cm^2 stretched Au foil. Measured Eγ, $\gamma\gamma$-coin, level lifetimes using recoil Distance Doppler Shift (RDDS) method with a plunger device, and ROSPHERE array with 15 HPGe detectors and 9 $LaBr_3$(Ce) detectors at the 9-MV Tandem Van de Graaff accelerator of the IFIN-HH, Bucharest facility. Comparison with predictions of interacting boson model (IBM).

^{86}Zr Levels

E(level)†	J$^\pi$†	$T_{1/2}$‡	Comments
0	0^+		
752	2^+	3.60 ps *14*	$T_{1/2}$: mean lifetime τ=5.2 ps *2* from weighted average of measured τ=5.1 ps *2* (gated at 915γ), and τ=5.8 ps *6* (gated at 1039γ). 2020Bu08 give weighted averaged τ=5.2 ps *3*.
1667	4^+	0.94 ps *12*	$T_{1/2}$: mean lifetime τ=1.36 ps *17* from weighted average of measured τ=1.1 ps *2* (gated at 1039γ), τ=1.55 ps *14* (gated at 628γ), and τ=0.92 ps *44* (gated at 718γ). 2020Bu08 give weighted averaged τ=1.4 ps *2*.
2670	6^+	1.52 ps *7*	$T_{1/2}$: measured mean lifetime τ=2.2 ps *1* (gated at 628γ).
2706	(5^-)	11.37 ps *21*	$T_{1/2}$: measured mean lifetime τ=16.4 ps *3* (gated at 718γ).
3298	8^+	49.42 ps *49*	$T_{1/2}$: mean lifetime τ=71.3 ps *7* from authors′ weighted average of measured τ=70.9 ps *10* (gated at 234γ), and τ=71.8 ps *10* (gated 1027γ), and τ=60 ps *12* (from fast timing method).
3423	(7^-)	6.24 ps *14*	$T_{1/2}$: measured mean lifetime τ=9.0 ps *2* (gated at 1006γ).
3533	8^+	3.12 ps *21*	$T_{1/2}$: measured mean lifetime τ=4.5 ps *3* (gated at 886γ).
4326	10^+	1.25 ps *7*	$T_{1/2}$: measured mean lifetime τ=1.8 ps *1* (gated at 1070γ).
4419	10^+		
4429	(9^-)		
5396	(12^+)		
6321	(14^+)		

† From the Adopted Levels. Energies are rounded values.

‡ From Recoil Distance Doppler Shift Method and analysis by differential decay curve method (DDCM) (2020Bu08).

γ(^{86}Zr)

E_i(level)	J_i^π	Eγ†	Iγ†	E_f	J_f^π	Mult.†	δ†	α‡	Comments
752	2^+	752		0	0^+	E2		1.34×10^{-3} *2*	B(E2)(W.u.)=29.0 *17* (2020Bu08)
1667	4^+	915		752	2^+	E2		8.26×10^{-4} *12*	B(E2)(W.u.)=40 *6* (2020Bu08)
2670	6^+	1003		1667	4^+	E2		6.66×10^{-4} *9*	B(E2)(W.u.)=16.5 *11* (2020Bu08)
2706	(5^-)	1039		1667	4^+	(E1)		2.68×10^{-4} *4*	B(E1)(W.u.)=2.71×10^{-5} *5* (2020Bu08)
3298	8^+	629		2670	6^+	E2		2.16×10^{-3} *3*	B(E2)(W.u.)=5.18 *6* (2020Bu08)
3423	(7^-)	718		2706	(5^-)	(E2)		1.52×10^{-3} *2*	B(E2)(W.u.)=21.3 *4* (2020Bu08)
3533	8^+	234	100.0 *19*	3298	8^+	M1(+E2)	<0.17	0.0212 *5*	B(E2)(W.u.)<290; B(M1)(W.u.)>0.42 (2020Bu08) B(E2)(W.u.) and B(M1)(W.u.) for δ(E2/M1)(234γ)<0.17 *1* in the Adopted dataset.
		862	16 *4*	2670	6^+	[E2]		9.54×10^{-4} *13*	B(E2)(W.u.)=2.3 *6* (2020Bu08)
4326	10^+	1028		3298	8^+	E2		6.30×10^{-4} *9*	B(E2)(W.u.)=17.2 *10* (2020Bu08)
4419	10^+	886		3533	8^+				
4429	(9^-)	1006		3423	(7^-)				

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^{73}Ge(^{16}O,3nγ) 2020Bu08 (continued)

$\gamma(^{86}Zr)$ (continued)

E_i(level)	J_i^π	E_γ †	E_f	J_f^π
5396	(12^+)	1070	4326	10^+
6321	(14^+)	925	5396	(12^+)

† From the Adopted Levels, Gammas dataset, when listed. Eγ values are rounded values.
‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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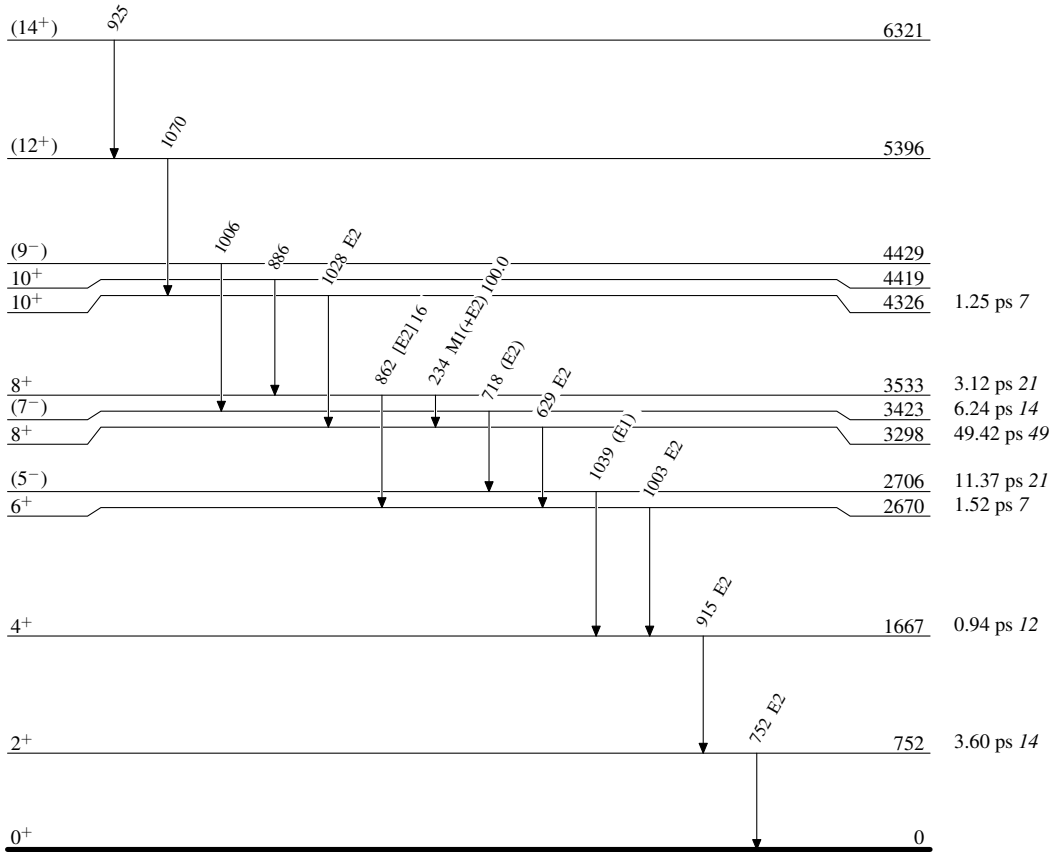
Level Scheme

Intensities: Relative photon branching from each level



$^{86}_{40}Zr_{46}$