

$^{176}\text{Yb}(^{28}\text{Si},\text{X}\gamma)$ 2005Pa48

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, G. Mukherjee, A. A. Sonzogni		NDS 111, 2555 (2010)	30-Jun-2009

- 2005Pa48:** $^{176}\text{Yb}(^{28}\text{Si},\text{X}\gamma)$: E=145 MeV. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ with the EUROGAM II array, consisting of 54 escape suppressed Ge detectors, 30 of which were of large-volume coaxial design with the remaining 24 being of the four-element clover type.
- 2005Pa48:** also includes $^{176}\text{Yb}(^{31}\text{P},\text{X}\gamma)$: E=152 MeV. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ with the EUROBALL IV array, comprising 15 cluster, 26 clover and 30 tapered single-crystal Ge detectors. Each cluster detector consisted of seven closely-packed, large-volume encapsulated Ge crystals.
- 1996Po06:** $^{162}\text{Dy}(^{36}\text{S},\text{F})$ at E = 162 MeV; Measured γ , $\gamma\gamma$ with EUROGAM array of 30 Ge detectors but did not propose a level scheme. Most of the γ rays were confirmed and placed in the level scheme of ^{95}Zr by **2005Pa48**.
- 2007Sz05:** $^{96}\text{Zr}(^{40}\text{Ca},^{41}\text{Ca})^{95}\text{Zr}$ at E= 152 MeV. Projectile-like products selected in PRISMA magnetic spectrometer, placed at $\theta_{\text{lab}}=68^\circ$. Coincident γ -ray spectra measured using CLARA array consisting of 24 Compton-suppressed Clover Ge detectors, covering 2π geometry. The γ -rays decaying from selectively populated $11/2^-$ and $9/2^+$ levels, are consistent with those observed in **2005Pa48**.

 ^{95}Zr Levels

E(level) [†]	J^π [‡]	Comments
0.0	$5/2^+$	
1676.8 8	$(7/2^+)$	
1792.6 8	$(9/2^+)$	
2022.3 11	$(11/2^-)$	J^π : shown without parentheses in level scheme figure 6 of 2005Pa48 .
2629.4 11	$(11/2^+)$	
2837.7 11	$(13/2^+)$	
3078.7 12	$(15/2^-)$	
3181.6 13	$(15/2^-)$	
3399.7 13	$(17/2^+)$	
3956.2 13	$(19/2^-)$	
4059.0 16	$(21/2^+)$	
4484.7 18	$(23/2^+)$	E(level): corresponding level at 4236 with the reversed ordering of 178-426 cascade in 2002Fo03 .
4663.0 18	$(25/2^+)$	
5390.7 21	$(25/2^+)$	
5662.1 23	$(27/2^+)$	
6563 3	$(31/2^+)$	

[†] From least-squares fit to $E\gamma$'s; $\Delta E\gamma=0.3$ keV assumed for each transition.

[‡] Tentative assignments based on well known low-spin states from literature, comparison with shell model calculations and by assuming spin values increase with excitation energy of levels. Tentative assignments are supported by comparison of corresponding states in neighboring Zr isotopes using a weak-coupling scheme.

 $\gamma(^{95}\text{Zr})$

E_γ [†]	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
102.8	100	4059.0	$(21/2^+)$	3956.2	$(19/2^-)$	
115.8 [#]	100 4	1792.6	$(9/2^+)$	1676.8	$(7/2^+)$	
178.3 [‡]	28 3	4663.0	$(25/2^+)$	4484.7	$(23/2^+)$	
208.3	69 4	2837.7	$(13/2^+)$	2629.4	$(11/2^+)$	
229.7 [#]	100	2022.3	$(11/2^-)$	1792.6	$(9/2^+)$	$E\gamma=2022$ was observed in 2007Sz05 , which is assigned to be E3 decay of $11/2^-$ level to g.s. on the basis of intensity ratio w.r.t. 230 keV E1 transition.
241.0	100 5	3078.7	$(15/2^-)$	2837.7	$(13/2^+)$	
271.4	100	5662.1	$(27/2^+)$	5390.7	$(25/2^+)$	E_γ : γ placed above the 4663 level in 2002Fo03 .

Continued on next page (footnotes at end of table)

${}^{176}\text{Yb}({}^{28}\text{Si}, \text{X}\gamma)$ 2005Pa48 (continued) $\gamma({}^{95}\text{Zr})$ (continued)

E_γ [†]	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ [†]	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
425.7 [‡]	100	4484.7	(23/2 ⁺)	4059.0	(21/2 ⁺)	836.8	75 5	2629.4	(11/2 ⁺)	1792.6	(9/2 ⁺)
556.5	100 6	3956.2	(19/2 ⁻)	3399.7	(17/2 ⁺)	877.5	63 7	3956.2	(19/2 ⁻)	3078.7	(15/2 ⁻)
562.0	100	3399.7	(17/2 ⁺)	2837.7	(13/2 ⁺)	901.0	100	6563	(31/2 ⁺)	5662.1	(27/2 ⁺)
604.0	100 8	4663.0	(25/2 ⁺)	4059.0	(21/2 ⁺)	1045.1	81 6	2837.7	(13/2 ⁺)	1792.6	(9/2 ⁺)
607.1	100 6	2629.4	(11/2 ⁺)	2022.3	(11/2 ⁻)	1056.4	63 8	3078.7	(15/2 ⁻)	2022.3	(11/2 ⁻)
727.7	100	5390.7	(25/2 ⁺)	4663.0	(25/2 ⁺)	1159.3	100	3181.6	(15/2 ⁻)	2022.3	(11/2 ⁻)
774.6	54 6	3956.2	(19/2 ⁻)	3181.6	(15/2 ⁻)	1676.8 [#]	100	1676.8	(7/2 ⁺)	0.0	5/2 ⁺
815.4	100 7	2837.7	(13/2 ⁺)	2022.3	(11/2 ⁻)	1792.6	11.9 17	1792.6	(9/2 ⁺)	0.0	5/2 ⁺

[†] Assignment of transitions to ${}^{95}\text{Zr}$ based on coincidence of γ rays with those of known transitions from complementary fission fragments, ${}^{102,103,104}\text{Ru}$ and Rh isotopes, and/or γ rays of ${}^{95}\text{Zr}$ already known from previous experiments.

[‡] The ordering of the 178.3-425.7 cascade was reversed in 2002Fo03.

[#] Observed in 2007Sz05 also.

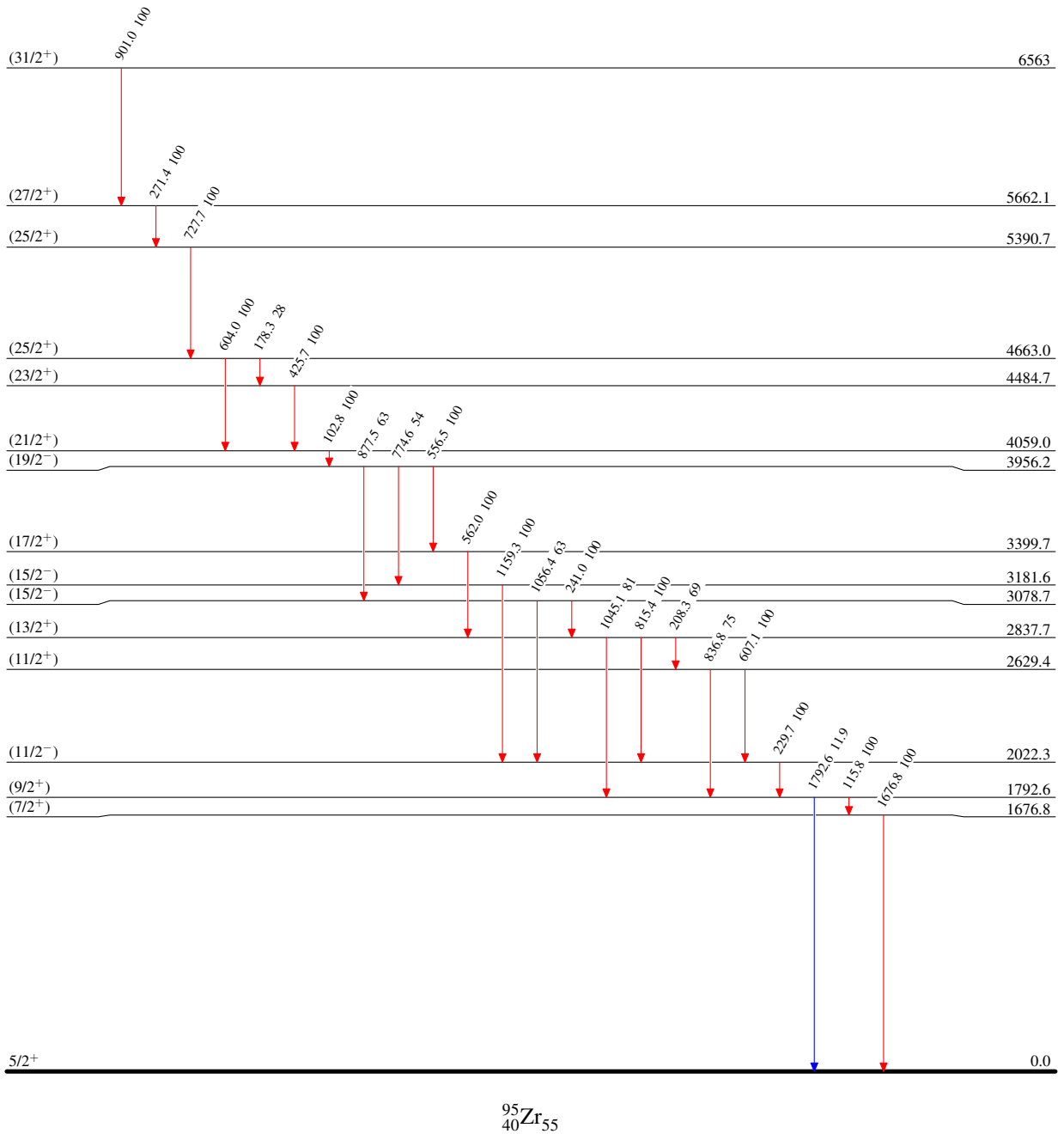
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Level Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

 $^{95}_{40}\text{Zr}_{55}$