

$^{90}\text{Zr}(\alpha,2\text{np}\gamma)$ 1973Gr31

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

E=43 MeV. 98.3% ^{90}Zr target. CoaxialGe(Li) (FWHM=2.5 keV at 1173 keV) and planar Ge(Li) (for x rays, FWHM=650 eV at 122 keV). Measured $E\gamma$, $I\gamma$, excitation functions (E=37-43 MeV), α - $\gamma(t)$ (deduced $T_{1/2}$, 10 ns lower limit), α - $\gamma(\theta)$ ($\theta=90^\circ-155^\circ$), $\gamma\gamma$, and $p\gamma$.

^{91}Nb Levels

E(level)	J^π [†]
0	9/2 ⁺
1790.45 25	(9/2 ⁻)
1984.29 25	(13/2 ⁻)
2290.7 3	(13/2 ⁺)
3110.1 5	(17/2 ⁺)
3467.0 6	(21/2 ⁺)

[†] From Adopted Levels.

$\gamma(^{91}\text{Nb})$

About 110 γ -rays were observed in $^{90}\text{Zr}(\alpha,xy)$; assignment to $(\alpha,2\text{np}\gamma)$ was based on the shape of the excitation function with respect to $(\alpha,2n\gamma)$, coincidences with charged particles, and coincidences with γ -rays which in turn are coincident with charged particles.

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
193.8 3	65	1984.29	(13/2 ⁻)	1790.45	(9/2 ⁻)		$A_2=+0.05$ 2, $A_4=0.0$. I_γ : 16% prompt, 84% has $T_{1/2}\approx 120$ ns.
356.9 3	61	3467.0	(21/2 ⁺)	3110.1	(17/2 ⁺)		$A_2=+0.29$ 2, $A_4=-0.10$ 3, mult=Q for doublet. I_γ : 100% prompt.
819.4 3	98	3110.1	(17/2 ⁺)	2290.7	(13/2 ⁺)	(E2)	$A_2=+0.31$ 2, $A_4=-0.10$ 3. I_γ : 96% prompt, 4% has $T_{1/2}>200$ ns.
1790.4 3	69	1790.45	(9/2 ⁻)	0	9/2 ⁺		$A_2=+0.08$ 3, $A_4=+0.03$ 4. I_γ : 30% prompt, 70% has $T_{1/2}\approx 120$ ns.
1984.3 3	97	1984.29	(13/2 ⁻)	0	9/2 ⁺		$A_2=+0.05$ 4, $A_4=0.0$. I_γ : 30% prompt, 70% has $T_{1/2}\approx 120$ ns.
2290.7 3	100	2290.7	(13/2 ⁺)	0	9/2 ⁺	(E2)	$A_2=+0.21$ 3, $A_4=-0.09$ 5. I_γ : 87% prompt, 13% has $T_{1/2}>200$ ns.





[†] Stretched Q from α - $\gamma(\theta)$, $T_{1/2}<10$ ns for parent level.

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Level Scheme

Intensities: Relative I_γ

Legend

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

