

⁸²Kr(α ,n γ) 1977Ar04,1980Ek03

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 116, 1 (2014)	31-Dec-2013

1977Ar04: E=14-21 MeV. Measured E γ , I γ , $\gamma(\theta)$, lifetimes by Doppler-shift analysis.

1980Ek03: E=14, 18 MEV. Measured E γ , I γ , $\gamma(\theta)$, $\gamma(\text{lin pol})$, lifetimes by DSAM.

⁸⁵Sr Levels

E(level)	J $^{\pi}$ [†]	T _{1/2} [#]	Comments
0.0	9/2 ⁺ [‡]		
231.69 10	7/2 ⁺	0.21 ns 5	T _{1/2} : from Doppler-shift analysis (1977Ar04).
238.79 5	1/2 ⁻	67.63 min 4	E(level),J $^{\pi}$,T _{1/2} : from Adopted Levels.
743.2 5	3/2 ⁻ [‡]		
767.0 4	5/2 ⁺ [‡]		
785.3 5	(5/2 ⁻) [‡]		
1111.4 3	13/2 ⁺	2.1 ps 7	Additional information 1.
1153.0 8	3/2 ⁻ [‡]		
1220.6 3	(11/2) ⁺	0.73 ps 17	
1262.0 7	9/2 ⁺ [‡]	0.60 ps 16	
1354.6 8			
1626.6 8	9/2 ⁺ [‡]	0.23 ps 6	
1658.1 6	(11/2) ⁺	0.8 ps 5	T _{1/2} : 0.28 to 1.32 ps; <1.7 ps at 18 MeV.
2102.1 6	(13/2 ⁻)		J $^{\pi}$: 11/2 ⁺ ,13/2 ⁻ ,15/2 ⁺ from $\gamma(\theta,\text{pol})$ (1980Ek03); excitation function favors 13/2 (1977Ar04).
2324.6 10	5/2 ⁺ [‡]		
2367.6 7	(17/2 ⁻)	1.1 ns 4	J $^{\pi}$: 13/2 ⁻ ,17/2 ⁻ from $\gamma(\theta,\text{pol})$ (1980Ek03) if J(2102)=13/2 ⁻ ; excitation function favors 17/2 (1977Ar04).
2400.5 7	(17/2) ⁺	1.8 ps 5	T _{1/2} : Doppler-shift analysis (1977Ar04). J $^{\pi}$: 13/2 ⁺ ,17/2 ⁺ from $\gamma(\theta,\text{pol})$ (1980Ek03); excitation function favors 17/2 (1977Ar04).
2854.9 9	(19/2 ⁺)		T _{1/2} : at 18 MeV. Other: <0.1 ns (1977Ar04). E(level): level not included in Adopted Levels, 454 γ relocated based on (¹³ C,4n γ) study by 2012KuZX.
3028.1 7	(15/2 ⁻ to 19/2 ⁻) [‡]		

[†] From $\gamma(\theta)$ and $\gamma(\text{lin pol})$ (1980Ek03) unless indicated otherwise.

[‡] From Adopted Levels.

[#] From DSAM (1980Ek03) At E α =14 MeV, except for 2400 level which is at 18 MeV. Systematic uncertainty of 25% from stopping powers is included.

$\gamma(^{85}\text{Sr})$

A₂ and A₄ coefficients are from 1977Ar04 unless otherwise stated. Values for strong γ rays are also available from 1980Ek03.

E γ [†]	I γ [‡]	E _i (level)	J $^{\pi}$ _i	E _f	J $^{\pi}$ _f	Mult. [#]	δ [#]	Comments
231.7 1		231.69	7/2 ⁺	0.0	9/2 ⁺	M1+E2	-0.18 +9-18	A ₂ =+0.28 6, A ₄ =0. Additional information 2.
265.5 5	15.5	2367.6	(17/2 ⁻)	2102.1	(13/2 ⁻)	E2		A ₂ =+0.03 4, A ₄ =+0.03 5, POL=-0.20 3 (1980Ek03) At E α =14 MeV. I γ : 32.7 At E α =21 MeV.

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⁸²Kr($\alpha, n\gamma$) **1977Ar04,1980Ek03** (continued)

γ (⁸⁵Sr) (continued)

E_γ †	I_γ ‡	E_i (level)	J_i^π	E_f	J_f^π	Mult.#	δ #	Comments
								$A_2=+0.30$ 3, $A_4=-0.11$ 4, POL=+0.57 6 (1980Ek03) At E α =14 MeV.
444.0 3	42.5	2102.1	(13/2 ⁻)	1658.1	(11/2) ⁺			Additional information 13. I_γ : 27.7 At E α =21 MeV. $A_2=-0.26$ 2, $A_4=0$.
454.4 5		2854.9	(19/2 ⁺)	2400.5	(17/2) ⁺			Additional information 11. I_γ : 3.3 At E α =21 MeV. E_γ : γ relocated based on (¹³ C,4n γ) study by 2012KuZX.
504.4 5	167.9	743.2	3/2 ⁻	238.79	1/2 ⁻			
535.6 5	54.6	767.0	5/2 ⁺	231.69	7/2 ⁺			
546.5 5	133.5	785.3	(5/2 ⁻)	238.79	1/2 ⁻			
627.6 5		3028.1	(15/2 ⁻ to 19/2 ⁻)	2400.5	(17/2) ⁺			I_γ : ≈ 8.0 At E α =21 MeV.
698.0 6	67.4	2324.6	5/2 ⁺	1626.6	9/2 ⁺			
766.6 6	58.6	767.0	5/2 ⁺	0.0	9/2 ⁺			
914.3 8	44.6	1153.0	3/2 ⁻	238.79	1/2 ⁻			
991.2 8	15.7	2102.1	(13/2 ⁻)	1111.4	13/2 ⁺			I_γ : unresolved from ($\alpha, 2n$) line. Additional information 12.
1030.3 8	39.6	1262.0	9/2 ⁺	231.69	7/2 ⁺	M1+E2	-0.16 +2-6	$A_2=+0.34$ 3, $A_4=-0.04$ 3, POL=-0.76 11 (1980Ek03) At E α =18 MeV. $A_2=-0.66$ 2, $A_4=+0.03$ 3, POL=-0.44 13 (1980Ek03) At E α =14 MeV. Additional information 5. branching ratio: $I_\gamma(1030)/I_\gamma(1262)=77.4$ 12/22.6 12 (1980Ek03).
1111.4 3	100.0	1111.4	13/2 ⁺	0.0	9/2 ⁺	E2		$A_2=+0.43$ 2, $A_4=-0.07$ 2. $A_2=+0.32$ 3, $A_4=-0.09$ 3, POL=+0.63 6 (1980Ek03) At E α =14 MeV. Additional information 3.
1122.9 8	20.3	1354.6		231.69	7/2 ⁺			
1220.6 3	96.7	1220.6	(11/2) ⁺	0.0	9/2 ⁺	M1+E2	-0.95 +17-9	I_γ : 17.5 At E α =21 MeV. Additional information 4. $A_2=-0.60$ 4, $A_4=0$. $A_2=-0.90$ 2, $A_4=+0.11$ 2, POL=+0.21 6 (1980Ek03) At E α =14 MeV.
1262	11.6	1262.0	9/2 ⁺	0.0	9/2 ⁺	M1+E2	-2.3 +4-14	E_γ : from 1980Ek03 only. I_γ : from $I_\gamma(1262\gamma)/I_\gamma(1030\gamma)=7.0$ 4/24.0 9 (1980Ek03). $A_2=-0.45$ 8, $A_4=-0.05$ 9 (1980Ek03) At E α =14 MeV. Additional information 6.
1288.9 8	5.9	2400.5	(17/2) ⁺	1111.4	13/2 ⁺	E2		I_γ : 28.0 At E α =21 MeV. $A_2=+0.31$ 2, $A_4=-0.08$ 2,

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⁸²Kr($\alpha, n\gamma$) **1977Ar04, 1980Ek03** (continued)

$\gamma(^{85}\text{Sr})$ (continued)

E_γ^\dagger	I_γ^\ddagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. #	$\delta^\#$	Comments
1394.9 8	24.1	1626.6	9/2 ⁺	231.69	7/2 ⁺	M1+E2	-0.8 5	POL=+0.63 13 (1980Ek03) At $E_\alpha=18$ MeV. Additional information 14. $A_2=-0.67$ 3, $A_4=+0.04$ 4, POL=+0.22 27 (1980Ek03) At $E_\alpha=14$ MeV. Additional information 7. branching ratio: $I_\gamma(1395)/I_\gamma(1627)=62$ 3/38 3 (1980Ek03).
1426.2 10	12.7	1658.1	(11/2) ⁺	231.69	7/2 ⁺	E2		I_γ : 7.0 At $E_\alpha=21$ MeV. $A_2=+0.37$ 3, $A_4=-0.21$ 4. Additional information 9. $A_2=+0.41$ 2, $A_4=-0.14$ 3, POL=+0.66 21 (1980Ek03) At $E_\alpha=18$ MeV. branching ratio: $I_\gamma(1426)/I_\gamma(1658)=33.6$ 13/66.4 13 (1980Ek03).
1627	15.0	1626.6	9/2 ⁺	0.0	9/2 ⁺			E_γ : from 1980Ek03. I_γ : from $I_\gamma(1627\gamma)/I_\gamma(1395\gamma)=8.7$ 9/14.0 7 (1980Ek03). Additional information 8.
1657.9 10	52.5	1658.1	(11/2) ⁺	0.0	9/2 ⁺	M1+E2	-1.40 +20-8	I_γ : 17.7 At $E_\alpha=21$ MeV. $A_2=-0.57$ 7, $A_4=0$. $A_2=-0.93$ 3, $A_4=+0.21$ 6, POL=+0.52 17 (1980Ek03) At $E_\alpha=14$ MeV. Additional information 10.

† From 1977Ar04.

‡ From 1977Ar04 at 14 MeV and $\theta=55^\circ$. Values also given at 21 MeV.

From 1980Ek03: γ polarization at 90° unless indicated otherwise; mult=M2 excluded by RUL.

$^{82}\text{Kr}(\alpha, n\gamma)$ 1977Ar04,1980Ek03

Level Scheme

Intensities: Relative I_γ

Legend

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

