^{86}Kr(α,nγ) 1981Wa10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 114, 1 (2013)	20-Oct-2012

1981Wa10: E=12-16 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, excitation functions, linear polarization, $T_{1/2}$ by Doppler-shift attenuation (DSA) method.

Other:

1975Ar06 (same group as 1981Wa10): E=11-14 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, excitation functions, $T_{1/2}$ by DSA method.

^{89}Sr Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[@]	Comments
0.0	5/2$^+$[#]		
1032.1 *5*	1/2$^+$[#]		
1473.5 *5*	(7/2)$^+$	0.26 ps *10*	
1940.2 *5*	5/2$^+$	0.19 ps *5*	
2007.9 *5*	3/2$^+$	0.10 ps *4*	
2061.6	(9/2$^+$)	0.21 ps *6*	
2079.0 *5*	11/2$^-$	0.33 ns *7*	$T_{1/2}$: DSA method (1975Ar06).
2930.6 *6*	9/2$^{(+)}$	0.15 ps *5*	
2962.0 *6*	9/2$^+$	0.7 ps *3*	
3388.2 *7*	15/2$^-$	>7 ps	
3404.1 *7*	11/2$^-$		
3524.3 *7*	13/2$^-$	0.39 ps *12*	
3599.0 *7*	(11/2$^+$)	0.43 ps *12*	
3672.1 *7*	13/2$^-$	2.4 ps *+27−8*	J$^\pi$: (15/2$^-$) in Adopted Levels. See arguments there.
3728.0 *9*			
3750.7 *8*	17/2$^-$		
4208.8 *8*	(19/2)$^-$		

[†] From least-squares fit to Eγ data, assuming Δ(Eγ)=0.5 keV.
[‡] From $\gamma(\theta)$ and γ(lin pol), unless indicated otherwise.
[#] From Adopted Levels.
[@] From DSA (1981Wa10).

γ(^{89}Sr)

A 791γ (I$\gamma\approx$2) (1975Ar06) is not confirmed by 1981Wa10.

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[‡]	δ[‡]	Comments
284.2	1.4	3672.1	13/2$^-$	3388.2	15/2$^-$			Unresolved doublet, part of it in coin with 1474γ.
323.9	0.8	3728.0		3404.1	11/2$^-$			
^{x}339.6	0.7							
362.8	7.8	3750.7	17/2$^-$	3388.2	15/2$^-$	M1(+E2)	+0.01 *3*	A$_2$=−0.22 *3*, A$_4$=−0.03 *3*, POL=−0.19 *6*. Additional information 8.
458.4	1.7	4208.8	(19/2)$^-$	3750.7	17/2$^-$	M1+E2	+0.41 *5*	A$_2$=+0.44 *4*, A$_4$=−0.01 *4*, POL=−0.25 *15*.
466.9	1.0	1940.2	5/2$^+$	1473.5	(7/2)$^+$	M1+E2	+0.18 *8*	A$_2$=−0.17 *3*, A$_4$=−0.02 *3*. Mult.: mult=M2 is excluded by RUL.
588.1	2.1	2061.6	(9/2$^+$)	1473.5	(7/2)$^+$	(M1+E2)	+0.01 *3*	A$_2$=−0.23 *6*, A$_4$=0. Additional information 2.
820.4	1.2	4208.8	(19/2)$^-$	3388.2	15/2$^-$	(E2)		A$_2$=+0.38 *8*, A$_4$=−0.21 *14*.
852	1.7	2930.6	9/2$^{(+)}$	2079.0	11/2$^-$			

Continued on next page (footnotes at end of table)

^{86}Kr(α,nγ) 1981Wa10 (continued)

γ(^{89}Sr) (continued)

E_γ	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	δ ‡	Comments
1032.1	3.0	1032.1	1/2$^+$	0.0	5/2$^+$			
1309.4	30.3	3388.2	15/2$^-$	2079.0	11/2$^-$	E2		A_2=+0.34 *2*, A_4=−0.14 *2*, POL=+0.57 *11*. Additional information 5.
1325.1	≈10	3404.1	11/2$^-$	2079.0	11/2$^-$			Additional information 6.
[x]1368.2	1.3							
1445.3	6.1	3524.3	13/2$^-$	2079.0	11/2$^-$	M1+E2	+0.67 *15*	A_2=+0.60 *7*, A_4=+0.06 *6*, POL=−0.77 *17*. Additional information 7.
1457.0	3.8	2930.6	9/2$^{(+)}$	1473.5	(7/2)$^+$	(M1+E2)	−0.24 *6*	δ: from A_2=−0.57 *2*, A_4=+0.06 *4*. However, POL=+0.88 *20* is in disagreement. δ=−0.24 *6* and A_2, A_4 values predict POL=−0.06. 1457γ could be contributed by a contaminant also.
1473.5	37.0	1473.5	(7/2)$^+$	0.0	5/2$^+$	M1+E2	+0.75 *7*	A_2=+0.40 *4*, A_4=+0.01 *4*, POL=−0.54 *15*. Additional information 1.
1488.5	3.5	2962.0	9/2$^+$	1473.5	(7/2)$^+$	D(+Q)		A_2=−0.26 *2*, A_4=+0.08 *3*, POL=+0.12 *24*. δ: 0.00 *5* or δ=+4.1 *+23−11* for J^π=9/2$^+$ and δ=0 for J^π=9/2$^-$.
1520.0	6.4	3599.0	(11/2$^+$)	2079.0	11/2$^-$	(E1)		A_2=+0.43 *5*, A_4=−0.03 *5*, POL=−0.72 *24*. δ: 0 for J^π=11/2$^+$ and δ=+0.43 *8* for J^π=13/2$^-$. The yield function favors J^π=11/2$^+$ for this state.
1592.8	4.5	3672.1	13/2$^-$	2079.0	11/2$^-$			A_2=+0.20 *3*, A_4=−0.03 *3*, POL=−0.34 *27*. Mult.: M1+E2, δ=+0.30 *3* proposed by 1981Wa10 based on $\gamma(\theta)$ and polarization data, but this assignment is inconsistent with E2 required by adopted spin-parity assignment. While $\gamma(\theta)$ would be consistent with ΔJ=2, quadrupole transition, negative value of polarization coefficient points towards M1 rather than E2 transition. With large uncertainty for polarization coefficient, it is possible that M1 assignment is insecure.
1940.0	4.1	1940.2	5/2$^+$	0.0	5/2$^+$	M1+E2		A_2=+0.02 *4*, A_4=−0.08 *4*, POL=+0.11 *20*. δ: −0.45 *17* or +6 *+9−3*.
2007.9	2.2	2007.9	3/2$^+$	0.0	5/2$^+$			
2061.6	22.0	2061.6	(9/2$^+$)	0.0	5/2$^+$			A_2=+0.30 *4*, A_4=−0.10 *5*, POL=+0.58 *13*. Additional information 3.
2079.1	100	2079.0	11/2$^-$	0.0	5/2$^+$	[E3]		A_2=+0.58 *4*, A_4=−0.01 *4*, POL=+0.63 *10*. Additional information 4.

† At Eα=14 MeV (1981Wa10).
‡ From $\gamma(\theta)$ and γ(lin pol) (1981Wa10).
[x] γ ray not placed in level scheme.

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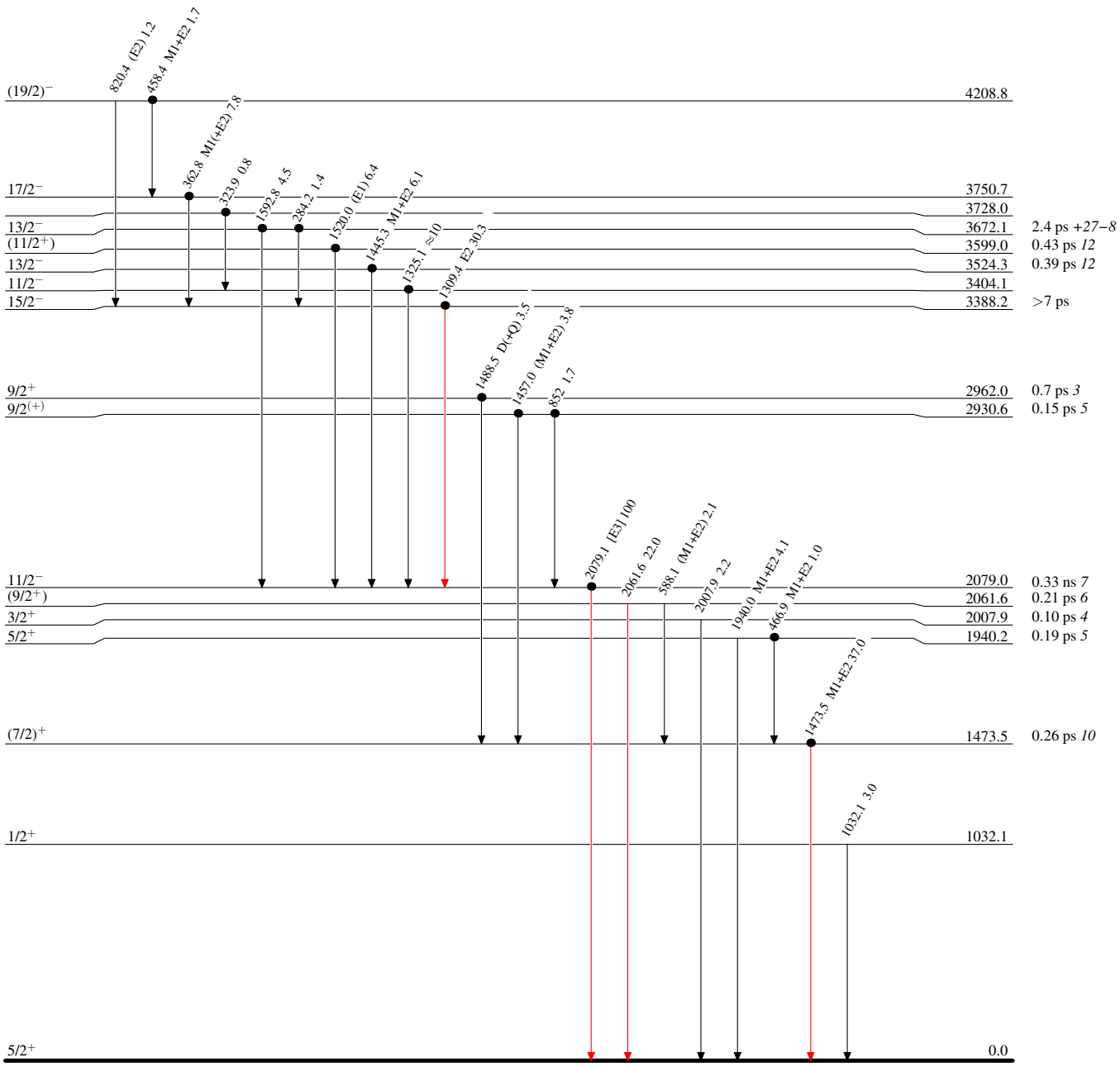
Level Scheme

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



$^{89}_{38}Sr_{51}$