^{81}Br(p,nγ) 1979To08,1977Wi08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 199,271 (2025)	1-Sep-2024

Others: 1980CaZT, 1978AgZW, 1972AgZS.

1979To08: E(p)=1.8-5.0 MeV, 99.6% ^{81}Br target; measured Eγ, α(K)exp, $\gamma\gamma$ coin, nγ coin, excit; Ge(Li) detector for γ, liquid scin for n.

1977Wi08: E(p)=5.0 MeV, 97.8% ^{81}Br target, Ge(Li) detector (FWHM=2.5 keV at 1.33 MeV) for Eγ>100, Si(Li) for low Eγ; measured Eγ, Iγ, $\gamma\gamma$ coin (timing FWHM=20 ns).

The level scheme is basically that of 1979To08. However, the evaluator has introduced a pair of levels at both 976 keV and 1744 keV, consistent with findings in other reaction studies.

^{81}Kr Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0	$7/2^+$		J$^\pi$: adopted value.
49.607 *35*	$9/2^+$	4.0 ns *4*	J^π from Adopted Levels. $T_{1/2}$: from 1978AgZW. Other: 8.4 ns *10* from n-γ(t) (1979To08).
190.76 *6*	$1/2^-$		
456.86 *6*	$5/2^-$		
549.11 *5*	$5/2^+$		J$^\pi$: adopted value.
608.64 *6*	$3/2^+,5/2^+$		
636.95 *7*	$3/2^-$		
701.12 *7*	$3/2^-,5/2^-$		
732.11 *7*	$7/2^+$		J$^\pi$: adopted value is $(5/2)^+$.
873.91 *14*			
902.59 *7*	$7/2^-,9/2^-$		
920.29 *8*	$(1/2^-,3/2^-)$		
933.6 *6*	$11/2^{(-)}$		Adopted π=+.
976.84 *9*	$1/2^+$		
976.86? *10*			
981.52 *10*	$11/2^+$		J$^\pi$: adopted value is $(9/2^+)$.
994.67 *9*	$3/2^+$		J$^\pi$: adopted π=−.
1014.93 *9*			
1025.91 *7*	$3/2^-,5/2^-$		
1100.47 *10*	$3/2^+,5/2^+$		
1206.73 *10*	7/2		
1239.66 *9*			J$^\pi$: π opposite to that for 920 level (from mult(319γ)).
1278.41 *13*			
1280.93 *10*			
1351.60 *12*			
1395.49 *15*			
1443.83 *9*			
1491.77 *18*			
1506.32 *8*			
1678.06 *9*			
1744.48 *10*			
1744.79 *11*			
1854.16 *21*			
1904.15 *24*			
1990.84 *17*			
2021.46? *21*			
2065.68 *15*			
2097.36 *21*			
2144.38 *21*			
2291.07 *24*			

Continued on next page (footnotes at end of table)

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

^{81}Kr Levels (continued)

† From a least-squares fit to Eγ, omitting a few Eγ lines. Comments added with Eγ.

‡ From 1979To08, except where otherwise noted. Spin-parity proposed in 1979To08 is based on their α(K)exp and excit data combined with earlier (d,p) and ε decay information. Excit data are normalized so $J^{\pi}=5/2^{+}$ for 549 level (1979To08). Discrepancies with adopted values are noted.

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

γ(^{81}Kr)

The assignment of the unplaced γ's to ^{81}Kr is not always certain.

E_γ[#]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[m]	δ[m]	α[o]	Comments
49.59 *4*		49.607	9/2$^+$	0	7/2$^+$				E_γ: weighted average of 49.60 *2* (1977Wi08) and 49.4 *1* (1979To08).
59.5[@] *1*		608.64	3/2$^+$,5/2$^+$	549.11	5/2$^+$				
[x]178.6 *2*	4.9 *15*								Tentative placement by 1979To08 from 1099 level is not supported by ^{81}Rb ε decay (30.5 min).
183.4 *2*	8.0 *16*	732.11	7/2$^+$	549.11	5/2$^+$				I_γ: 4.6 *8* from n-gated γ spectrum. From adopted branching and I(682γ), I(183γ)=7.9 *17* is expected here.
190.8 *1*	311 *8*	190.76	1/2$^-$	0	7/2$^+$				E_γ: other: 190.6 *3* (1977Wi08).
219.2 *1*	3.9 *4*	920.29	(1/2$^-$,3/2$^-$)	701.12	3/2$^-$,5/2$^-$				
244.1 *1*	6.7 *5*	701.12	3/2$^-$,5/2$^-$	456.86	5/2$^-$				
266.7[†] *2*	1.9 *4*	456.86	5/2$^-$	190.76	1/2$^-$				E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=266.10.
283.3 *1*	8.4 *4*	920.29	(1/2$^-$,3/2$^-$)	636.95	3/2$^-$	M1		0.00839 *12*	α(K)exp=0.0060 *9* α(K)=0.00744 *10*; α(L)=0.000809 *11*; α(M)=0.0001311 *18* α(N)=1.321×10^{-5} *19* I_γ: 5.8 *9* in n-gated γ spectrum.
301.6 *1*	4.0 *4*	1278.41		976.84	1/2$^+$				
319.4 *1*	4.3 *5*	1239.66		920.29	(1/2$^-$,3/2$^-$)	E1(+M2)	0.16 *+9−16*	0.0037 *8*	α(K)exp=0.0033 *7* α(K)=0.0033 *7*; α(L)=0.00036 *8*; α(M)=5.7×10^{-5} *13* α(N)=5.8×10^{-6} *13*
340.0 *1*	21.0 *7*	976.84	1/2$^+$	636.95	3/2$^-$	E1		0.00263 *4*	α(K)exp=0.00174 *30* α(K)=0.002334 *33*; α(L)=0.0002485 *35*; α(M)=4.01×10^{-5} *6* α(N)=4.03×10^{-6} *6*
357.8 *1*	5.6 *4*	994.67	3/2$^+$	636.95	3/2$^-$	E1[n]		2.29×10^{-3} *3*	α(K)exp=0.0021 *4* α(K)=0.002036 *29*; α(L)=0.0002166 *30*; α(M)=3.50×10^{-5} *5* α(N)=3.51×10^{-6} *5* Mult.: from α(K)exp. This conflicts with adopted mult=(M1+E2), based on α(K)exp from Rb ε decay (4.571 h).
368.1[q] *1*	6[qb]	976.84	1/2$^+$	608.64	3/2$^+$,5/2$^+$				Iγ=9.0 *5* for doublet.

$^{81}_{36}Kr_{45}$-3

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

γ(^{81}Kr) (continued)

E_γ [#]	I_γ [&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [m]	δ [m]	α [o]	Comments
368.1 [qr]	3 [qb]	1100.47	3/2$^+$,5/2$^+$	732.11	7/2$^+$				For doublet, Eγ=368.1 *1* and Iγ=9.0 *5*.
[x]371.3 *1*	2.1 *4*								Tentative placement by 1979To08 from 920 level is not supported by ^{81}Rb ε decay (4.571 h).
389.0 *1*	7.4 *5*	1025.91	3/2$^-$,5/2$^-$	636.95	3/2$^-$	M1		0.00387 *5*	α(K)exp=0.0028 *6* α(K)=0.00343 *5*; α(L)=0.000370 *5*; α(M)=6.00×10^{-5} *8* α(N)=6.05×10^{-6} *8*
446.4 [q] *1*	132 [qb]	636.95	3/2$^-$	190.76	1/2$^-$	M1+E2	0.44 *+20−26*	0.00307 *23*	α(K)exp=0.00273 *20* α(K)=0.00273 *20*; α(L)=0.000296 *24*; α(M)=4.8×10^{-5} *4* α(N)=4.8×10^{-6} *4* Eγ: other: 446.1 *5* (1977Wi08). Iγ=138.3 *34* for doublet. α(K)exp: Weighted average of 0.00268 *26* (1979To08) and 0.0028 *3* (1972AgZS, assuming E3-theory value for α(K)exp(190)).
446.4 [q]	6.1 [qb]	902.59	7/2$^-$,9/2$^-$	456.86	5/2$^-$				Eγ: other: 446.1 *5* (1977Wi08). For doublet, Eγ=446.4 *1* and Iγ=138.3 *34*.
456.9 *1*	100	456.86	5/2$^-$	0	7/2$^+$	E1		1.22×10^{-3} *2*	α(K)exp=0.00097 *12* α(K)=0.001080 *15*; α(L)=0.0001146 *16*; α(M)=1.852×10^{-5} *26* α(N)=1.863×10^{-6} *26* Eγ: other: 456.7 *3* (1977Wi08).
463.5 *1*	7.9 [b]	1100.47	3/2$^+$,5/2$^+$	636.95	3/2$^-$				Iγ: Iγ=8.7 *8* for 465.3γ+465.9γ doublet.
465.9 *1*	2.9 [b]	1014.93		549.11	5/2$^+$				Iγ: Iγ=8.7 *8* for 465.3γ+465.9γ doublet.
476.8 *1*	8.7 *8*	1025.91	3/2$^-$,5/2$^-$	549.11	5/2$^+$	E1		1.09×10^{-3} *2*	α(K)exp<0.0006 α(K)=0.000971 *14*; α(L)=0.0001030 *14*; α(M)=1.664×10^{-5} *23* α(N)=1.674×10^{-6} *23* Eγ: other: 476.9 *3* (1977Wi08).
499.5 *1*	26.2 *11*	549.11	5/2$^+$	49.607	9/2$^+$	[E2]		0.00320 *4*	α(K)=0.00283 *4*; α(L)=0.000314 *4*; α(M)=5.07×10^{-5} *7* α(N)=5.04×10^{-6} *7* Eγ: other: 499.4 *3* (1977Wi08).
510.3 *1*	84 [a] *3*	701.12	3/2$^-$,5/2$^-$	190.76	1/2$^-$	E2		0.00300 *4*	α(K)exp=0.0025 *5* α(K)=0.00266 *4*; α(L)=0.000293 *4*; α(M)=4.75×10^{-5} *7* α(N)=4.72×10^{-6} *7* Iγ: from n-gated γ spectrum. Iγ=103.2 *27* in singles

$^{81}_{36}Kr_{45}$-4

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

γ(^{81}Kr) (continued)

E_γ[#]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[m]	δ[m]	α[o]	Comments
									γ spectrum for 510γ + $\gamma^\pm$ doublet.
									α(K)exp from n-γ coincidence data.
[x]520.0 *1*	20.2 *10*								
537.9 *2*	15 *3*	994.67	$3/2^+$	456.86	$5/2^-$				E_γ: unresolved from ^{81}Br γ.
538.9 *2*	12 *2*	1239.66		701.12	$3/2^-$,$5/2^-$				
549.1 *1*	85.7 *21*	549.11	$5/2^+$	0	$7/2^+$	M1+E2	1.2 *+28−6*	0.00213 *24*	α(K)exp=0.00190 *20* α(K)=0.00189 *21*; α(L)=0.000206 *25*; α(M)=3.3×10^{-5} *4* α(N)=3.3×10^{-6} *4* E_γ: other: 549.0 *3* (1977Wi08). I_γ: 9.6 *19* in n-gated γ spectrum.
[x]552.4 *1*	3.4 *7*								
569.0 *1*	10.2 *5*	1025.91	$3/2^-$,$5/2^-$	456.86	$5/2^-$	M1,E2		0.00188 *29*	α(K)exp=0.0016 *4* α(K)=0.00167 *26*; α(L)=0.000181 *30*; α(M)=2.9×10^{-5} *5* α(N)=2.9×10^{-6} *5* E_γ: other: 569.4 *3* (1977Wi08).
579.4[†] *1*	2.2 *4*	1280.93		701.12	$3/2^-$,$5/2^-$				E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=579.81.
597.6[r] *4*		1206.73	7/2	608.64	$3/2^+$,$5/2^+$				I_γ: weak.
601.9	2.7	1239.66		636.95	$3/2^-$				E_γ,I_γ: from drawing.
608.7 *1*	96.4 *28*	608.64	$3/2^+$,$5/2^+$	0	$7/2^+$	E2		1.79×10^{-3} *3*	α(K)exp=0.00144 *19* α(K)=0.001584 *22*; α(L)=0.0001732 *24*; α(M)=2.80×10^{-5} *4* α(N)=2.80×10^{-6} *4* E_γ: other: 608.6 *3* (1977Wi08). δ: abs(δ)=1.3 −9+∞ if mult.=E2+M1.
644.0[q]	0.6[qc] *3*	1100.47	$3/2^+$,$5/2^+$	456.86	$5/2^-$				E_γ: 644.0 *1* for doublet.
644.0[q] *1*	2.9[qc] *5*	1744.48		1100.47	$3/2^+$,$5/2^+$				
650.5 *1*	2.9 *4*	1351.60		701.12	$3/2^-$,$5/2^-$				
657.7 *1*	13.8 *6*	1206.73	7/2	549.11	$5/2^+$	D,E2			α(K)exp=0.0009 *6*
669.5[r] *4*	2.0 *5*	1278.41		608.64	$3/2^+$,$5/2^+$				
[x]674.4 *5*	1.8 *5*								
682.4 *1*	28.3 *9*	732.11	$7/2^+$	49.607	$9/2^+$	(E2)		1.30×10^{-3} *2*	α(K)exp=0.00096 *20* α(K)=0.001153 *16*; α(L)=0.0001253 *18*; α(M)=2.027×10^{-5} *28* α(N)=2.030×10^{-6} *28* E_γ: other: 682.6 *3* (1977Wi08). Mult.: M1,E2 from α(K)exp; adopted level scheme requires ΔJ=2.
694.1 *4*	13.8 *7*	1395.49		701.12	$3/2^-$,$5/2^-$				I_γ: 7.7 *15* in n-gated γ spectrum.

$^{81}_{36}Kr_{45}$-5

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

$\gamma(^{81}Kr)$ (continued)

E_γ[#]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[m]	α[o]	Comments
714.7[k] *3*	1.8 *6*	1351.60		636.95	3/2$^-$			I_γ: 5.4 *13* in n-gated γ spectrum.
[x]729.6[q] *1*	30[qd] *12*							E_γ: other: 729.8 *3* (1977Wi08).
729.6[q] *1*	58[qd] *12*	920.29	(1/2$^-$,3/2$^-$)	190.76	1/2$^-$			α(K)=0.00081 E_γ: other: 729.8 *3* (1977Wi08). α(K)exp=0.00077 *10* (indicating mult.=M1) for multiplet consisting of 729.6 transitions and the 732γ doublet; at least half the multiplet's Iγ deexcites the 920 level.
729.6[q] *1*	1.6[qd] *8*	1744.48		1014.93				E_γ: other: 729.8 *3* (1977Wi08).
732.1[q] *1*	13.3[ql] *23*	732.11	7/2$^+$	0	7/2$^+$			
732.1[q]	≤3[ql]	1280.93		549.11	5/2$^+$			E_γ: 732.1 *1* for doublet.
742.5 *1*	4.6 *6*	1443.83		701.12	3/2$^-$,5/2$^-$			
758.1[q] *3*	1.8[qe] *5*	1395.49		636.95	3/2$^-$			
758.1[q] *3*	0.43[qe] *6*	1678.06		920.29	(1/2$^-$,3/2$^-$)			
761.9[‡] *1*	2.7 *5*	1744.48		981.52	11/2$^+$			E_γ: very poor fit and omitted in the fitting; level-energy difference=762.96.
803.8 *1*	4.9 *5*	994.67	3/2$^+$	190.76	1/2$^-$			
[x]809.1 *2*	2.3 *5*							
824.3[q] *2*	3.8[q] *8*	873.91		49.607	9/2$^+$			I_γ: 4.4 *7* for probable doublet. From adopted branching and I(874γ) here, I(824γ)=3.8 *8* is expected from 874 level, leaving Iγ=0.6 *11* from 1280 level.
824.3[qr] *2*	≤1.7[q]	1280.93		456.86	5/2$^-$			I_γ: see comment on I(824γ) from 874 level.
835.2 *2*	17.7 *8*	1025.91	3/2$^-$,5/2$^-$	190.76	1/2$^-$	M1,E2	0.00072 *4*	α(K)exp=0.00062 *22* α(K)=0.00064 *4*; α(L)=6.9×10^{-5} *5*; α(M)=1.11×10^{-5} *8* α(N)=1.12×10^{-6} *7* E_γ: weighted average of 834.7 *3* (1977Wi08) and 835.2 *1* (1979To08). E_γ: unresolved from ^{81}Br γ.
[x]843.8 *1*	7.7 *7*							
853.1 *1*	8.2 *7*	902.59	7/2$^-$,9/2$^-$	49.607	9/2$^+$	E1	2.92×10^{-4} *4*	α(K)exp<0.00032 α(K)=0.000260 *4*; α(L)=2.74×10^{-5} *4*; α(M)=4.43×10^{-6} *6* α(N)=4.47×10^{-7} *6*
873.9 *2*	2.3 *5*	873.91		0	7/2$^+$			
883.2 *2*	≤13.9	1491.77		608.64	3/2$^+$,5/2$^+$			Iγ=13.9 *6* for the 884.0γ+883.2γ doublet.
884.0 *6*	≤13.9	933.6	11/2$^{(-)}$	49.607	9/2$^+$			Iγ=13.9 *6* for the 884.0γ+883.2γ doublet.
[x]893.0 *1*	5.1 *5*							
897.9 *1*	6.6 *6*	1506.32		608.64	3/2$^+$,5/2$^+$			
902.4 *1*	11.2 *6*	902.59	7/2$^-$,9/2$^-$	0	7/2$^+$			
926.9[r] *3*	3.1 *4*	976.86?		49.607	9/2$^+$			E_γ: tentatively placed by evaluator; a complex line with similar Eγ is observed in (α,3nγ) and placed from 976,

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

γ(^{81}Kr) (continued)

E_γ[#]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						1828 and 2534 levels; the latter two levels do not appear to be populated in (p,nγ).
931.9 *1*	8.5 *5*	981.52	11/2$^+$	49.607	9/2$^+$	
939.9[k†] *3*	2.6 *5*	1395.49		456.86	5/2$^-$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=938.63.
942.5 *3*	5.3 *5*	1491.77		549.11	5/2$^+$	
957.0 *1*	6.9 *6*	1506.32		549.11	5/2$^+$	
[x]966.5 *1*	7.0 *6*					
976.9[pr] *1*	≤1.1[pf]	976.86?		0	7/2$^+$	
976.9[q] *1*	4.8[qf] *7*	1678.06		701.12	3/2$^-$,5/2$^-$	E_γ: for complex line.
976.9[qr]	≤1.1[qf]	1990.84		1014.93		E_γ: 976.9 *1* for multiply-placed γ. Not adopted this placement.
980.4[‡] *1*	3.8[a] *12*	981.52	11/2$^+$	0	7/2$^+$	E_γ: very poor fit and omitted in the fitting; level-energy difference=981.52. I_γ: in γ singles spectrum this γ is overlapped by γ from ^{41}K(p,p′γ) reaction.
987.1 *1*	3.6 *6*	1443.83		456.86	5/2$^-$	
[x]1011.5 *1*	2.9 *6*					
1015.3[q] *5*	1.65[qg]	1014.93		0	7/2$^+$	
1015.3[q†r] *5*	3.65[qg]	1990.84		976.84	1/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1013.98.
[x]1026.1 *1*	3.2 *6*					
1041.1[r] *1*	4.5 *6*	1678.06		636.95	3/2$^-$	
1048.8[q] *1*	2.8[qh] *6*	1239.66		190.76	1/2$^-$	
1048.8[q]	<1.2[qh]	1506.32		456.86	5/2$^-$	E_γ: 1048.8 *1* for doublet.
1087.3[p]	7.8[pi] *9*	1278.41		190.76	1/2$^-$	E_γ: 1087.3 *1* for triplet.
1087.3[pr]	7.8[pi] *9*	1990.84		902.59	7/2$^-$,9/2$^-$	E_γ: 1087.3 *1* for triplet.
1087.3[q†r]	1.6[qi] *6*	2065.68		976.84	1/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1088.84. Eγ=1087.3 *1* for triplet.
1090.2 *1*	3.6 *6*	1280.93		190.76	1/2$^-$	
1099.6[‡] *1*	23.0 *9*	1100.47	3/2$^+$,5/2$^+$	0	7/2$^+$	E_γ: very poor fit and omitted in the fitting; level-energy difference=1100.46.
1107.9 *1*	3.7 *6*	1744.79		636.95	3/2$^-$	I_γ: 6.0 *13* in n-gated γ spectrum.
1135.9[r] *3*	4.4[j] *8*	1744.79		608.64	3/2$^+$,5/2$^+$	
[x]1144.4 *4*	2.5 *6*					
[x]1150.7 *2*	8.8 *6*					
1156.9 *2*	5.8 *6*	1206.73	7/2	49.607	9/2$^+$	
[x]1165.4 *9*	1.8 *5*					
1177.0 *2*	6.2 *6*	2097.36		920.29	(1/2$^-$,3/2$^-$)	
[x]1188.1 *4*	2.9 *6*					
1195.2 *2*	2.7 *6*	1744.48		549.11	5/2$^+$	
1217.2 *2*	5.2 *7*	1854.16		636.95	3/2$^-$	I_γ: 8.2 *13* in n-gated γ spectrum.
1224.1 *2*	2.4 *7*	2144.38		920.29	(1/2$^-$,3/2$^-$)	
[x]1269.6 *2*	2.9 *6*					
[x]1290.6 *2*	4.4 *7*					
[x]1297.8 *2*	8.7 *8*					

$^{81}_{36}Kr_{45}$-7

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

γ(^{81}Kr) (continued)

E_γ[#]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1309.4 *4*	7.2[a] *15*	2291.07		981.52	11/2$^+$	
x1318.5 *2*	1.5 *6*					I_γ: 5.5 *14* in n-gated γ spectrum.
x1327.5 *2*	4.2[a] *13*					
x1337.4 *2*	2.9 *6*					I_γ: 6.1 *14* in n-gated γ spectrum.
x1344.7 *2*	6.3 *6*					
1350.4[†] *2*	3.8 *6*	1351.60		0	7/2$^+$	E_γ: uncertainty multiplied by a factor of 3 in the fitting; level-energy difference=1351.59.
x1357.7 *2*	1.1 *6*					
1364.5 *2*	2.6 *6*	2065.68		701.12	3/2$^-$,5/2$^-$	
x1374.8 *2*	2.6 *6*					
1382.0 *2*	6.2 *6*	1990.84		608.64	3/2$^+$,5/2$^+$	
1384.5[r] *2*	2.2 *6*	2021.46?		636.95	3/2$^-$	I_γ: 7.4 *15* in n-gated γ spectrum.
1395.6 *2*	2.6 *6*	1395.49		0	7/2$^+$	
x1405.8 *2*	2.9 *6*					
x1409.8 *2*	2.9 *6*					
x1422.3 *2*	10.0 *8*					I_γ: 14.7 *15* in n-gated γ spectrum.
1428.9 *2*	7.5 *8*	2065.68		636.95	3/2$^-$	
x1432.5 *2*	4.3 *8*					
1444.1[r] *2*	2.8 *8*	1443.83		0	7/2$^+$	
x1468.2 *3*	4.3 *8*					
x1497.8 *3*	5.5 *14*					
1506.4 *3*	8.5 *8*	1506.32		0	7/2$^+$	
1535.1[†] *3*	2.8 *7*	1990.84		456.86	5/2$^-$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1533.96.
x1550.1 *3*	8.5 *16*					
1553.6 *3*	3.9 *8*	1744.79		190.76	1/2$^-$	Tentatively placed by 1979To08, but Eγ=1554.6 *5* is reported from this level in ^{81}Rb ε decay (4.571 h).
x1565.0 *3*	4.4[a] *14*					
x1575.1 *3*	6.8 *8*					
x1608.0 *4*	4.9 *7*					
x1610.3 *6*	1.6 *7*					
x1632.3 *3*	6.9 *8*					
x1636.6 *4*	6.6 *8*					
x1640.5 *4*	5.7 *8*					
x1644.7 *4*	5.6 *8*					
x1656.3 *4*	3.0 *7*					
1682.6 *3*	2.9 *7*	2291.07		608.64	3/2$^+$,5/2$^+$	
x1726.3 *3*	2.4 *7*					
1744.0 *10*	3.9[a] *12*	1744.48		0	7/2$^+$	
x1761.3 *7*	1.6 *6*					
x1779.5 *5*	5.3 *7*					
x1790.1 *6*	1.9 *7*					
x1794.7 *5*	2.8 *7*					

$^{81}_{36}Kr_{45}$-8

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

γ(^{81}Kr) (continued)

E_γ[#]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1831.6[k†] *5*	2.6 *6*	2291.07		456.86	5/2$^-$	E_γ: uncertainty multiplied by a factor of 3 in the fitting; level-energy difference=1834.19.
1854.2 *4*	4.9 *6*	1904.15		49.607	9/2$^+$	I_γ: 2.3 *9* in n-gated γ spectrum.
1874.6 *4*	3.9 *6*	2065.68		190.76	1/2$^-$	
[x]1881.4 *4*	2.6 *6*					
[x]1884.9 *4*	3.7 *6*					
1904.3 *3*	6.2 *7*	1904.15		0	7/2$^+$	
1908 *1*	3.2 *7*	2097.36		190.76	1/2$^-$	I_γ: 6.5 *12* in n-gated γ spectrum.
1953 *1*	3.0 *6*	2144.38		190.76	1/2$^-$	

† Poor fit; uncertainty multiplied by a factor in the fitting.
‡ Very Poor fit and omitted in the fitting.
# From 1979To08, except as noted. Evaluator suspects that ΔE has been underestimated by 1979To08 since Eγ differs from the least-squares adjusted value for a number of lines; alternatively, several γ may have been misplaced.
@ γ unplaced in 1979To08; placed by evaluator by analogy with ^{81}Rb ε decay (4.571 h).
& Relative photon intensity from singles γ spectrum for E(p)=4.0 MeV (1979To08), except as noted.
[a] From nγ coin γ spectrum (1979To08). Iγ values determined by this means are generally consistent with those from singles γ spectrum, but there exist several unexplained inconsistencies; in such cases, the authors′ choice of Iγ is adopted and the discrepancy is noted.
[b] From level scheme of 1979To08. Iγ tabulated in 1979To08 is total Iγ for multiplet.
[c] From adopted I(644γ)/I(1099γ)=0.025 *13* for 1100 level, and I(1100γ) and Iγ(644 doublet)=3.5 *4* here, evaluator deduced I(644γ from 1100 level)=0.6 *3*, leaving Iγ=2.9 *5* for 644γ from 1744 level.
[d] From I(729γ)/I(219γ+283γ) for 920 level in 4.6 h ε decay, and I(219γ+283γ) and Iγ(729 doublet)=90.0 *23* here, evaluator deduces I(729γ)=58 *12* from 920 level in (p,nγ), leaving Iγ=32 *12* to be placed elsewhere. One expects I(729γ)=0.8 or 2.3 from 1744 level based on I(729γ)/I(1195γ) or I(729γ)/I(1744γ), respectively, from 4.6 h ε decay, so evaluator places Iγ=1.6 *8* from 1744 level, leaving I(729γ)=30 *12* which is shown as an additional unplaced γ. Iγ(729 doublet)=101 *3* in n-gated γ spectrum.
[e] From adopted I(758γ)/I(1041γ) for 1678 level, and I(1041γ) and Iγ(758 doublet)=2.2 *5* here, evaluator deduces I(758γ from 1678 level)=0.43 *6*, leaving Iγ=1.8 *5* for 758γ from 1396 level.
[f] From adopted I(977γ)/I(1041γ) for 1678 level, and I(1041γ) and Iγ(977 triplet)=5.0 *7* here, evaluator deduces I(977γ from 1678 level)=4.8 *7*, leaving Iγ=0.2 *9* for 977γ from 976+1990 levels. The tentative placement of a component of the 977γ from the 977 level comes from 1979To08 alone, and has not been included in Adopted Levels, Gammas.
[g] From adopted I(1014γ)/I(465γ) for 1015 level, and I(465γ) and Iγ(1014 doublet)=5.3 *13* from n-gated γ spectrum, evaluator deduces I(1014γ from 1014 level)=1.65, leaving Iγ=3.65 for 1014γ from 1990 level. Doublet overlapped by unknown transition(s) (presumably not from ^{81}Kr) in singles γ spectrum, where Iγ(multiplet)=15.8 *7*.
[h] From adopted I(1048γ)/I(538γ) for 1239 level, and I(538γ) and Iγ(1048 doublet)=2.8 *6* here, evaluator deduces I(1048γ from 1239 level)=3.0 *13*, leaving Iγ=−0.2 *14* for 1048γ from 1505 level.
[i] From adopted I(1087γ)/I(1429γ) for 2064 level, and I(1429γ) and Iγ(1087 triplet)=9.4 *7* here, evaluator deduces I(1087γ from 2064 level)=1.6 *6*, leaving Iγ=7.8 *9* for 1087γ from 1278+1990 levels.
[j] I(1136γ)/I(1108γ)=1.19 *30* in this dataset is much higher compared to the ratio of I(1136γ)/I(1108γ)=0.23 *5* in the adopted dataset. A weak 1135.0γ is placed from

^{81}Br(p,nγ) 1979To08,1977Wi08 (continued)

$\gamma(^{81}Kr)$ (continued)

2069 keV level in (α,nγ).

[k] Eγ differs from least-squares adjusted value by $\geq 3\sigma$.

[l] Iγ=19.1 *11* for doublet in singles γ spectrum, 13.4 *24* in n-gated γ spectrum. From adopted branching for 732 level and I(682γ), one expects I(732γ)=13.3 *23* from 732 level, leaving I(732γ)=0.1 *33* from 1281 level.

[m] From α(K)exp (1979To08), measured with electron spectrometer (relative efficiency determined using 10 well-known α(K)′s from various reactions); values relative to α(K)(499.5γ, ^{81}Kr)=E2(theory)=0.00263.

[n] Not adopted. Inconsistent with log *ft* in ^{81}Rb ε decay (4.571 h); reason for discrepancy not known.

[o] Additional information 1.

[p] Multiply placed with undivided intensity.

[q] Multiply placed with intensity suitably divided.

[r] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

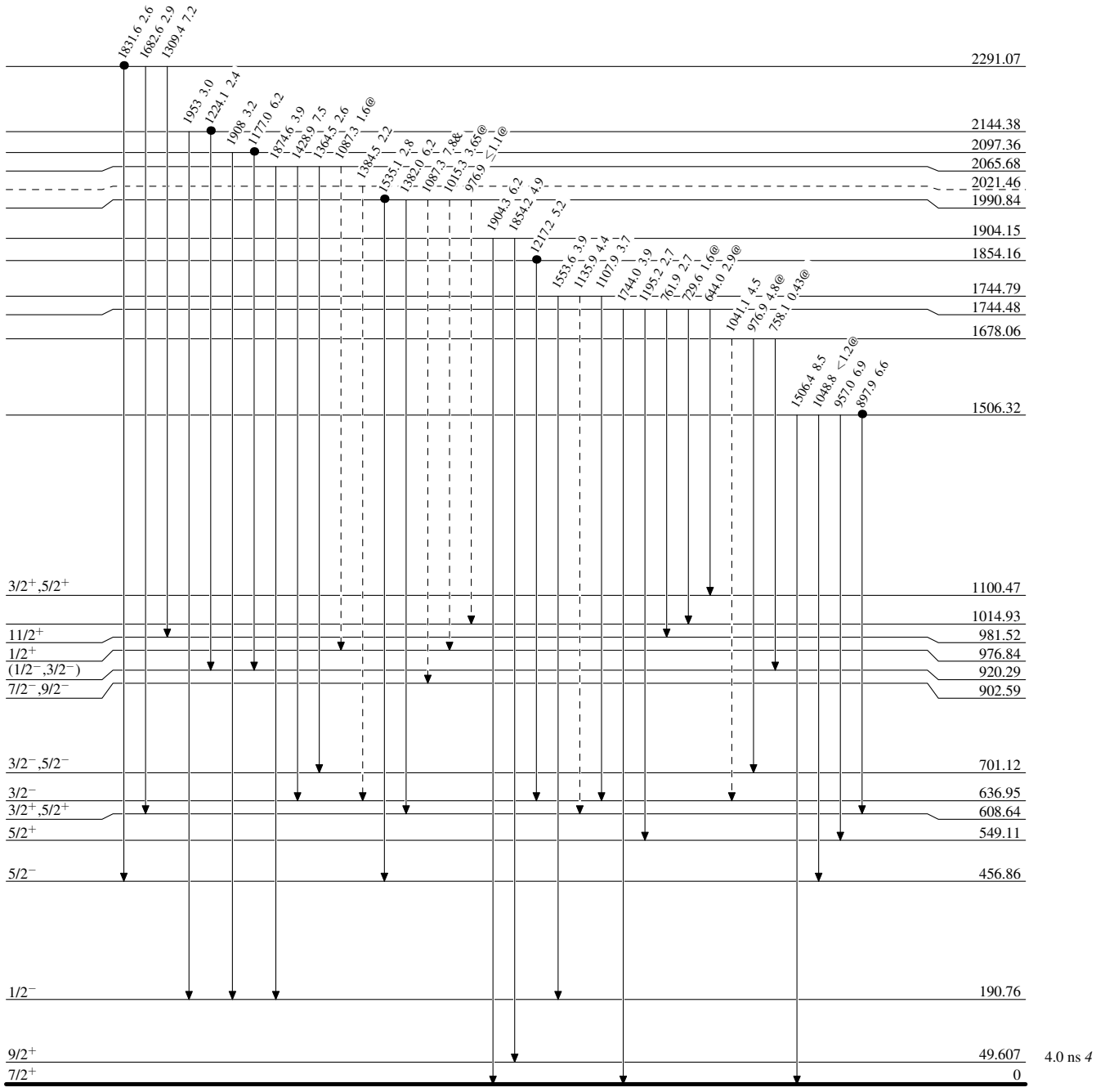
$^{81}_{36}Kr_{45}$-10

^{81}Br(p,nγ) 1979To08,1977Wi08

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)
Coincidence



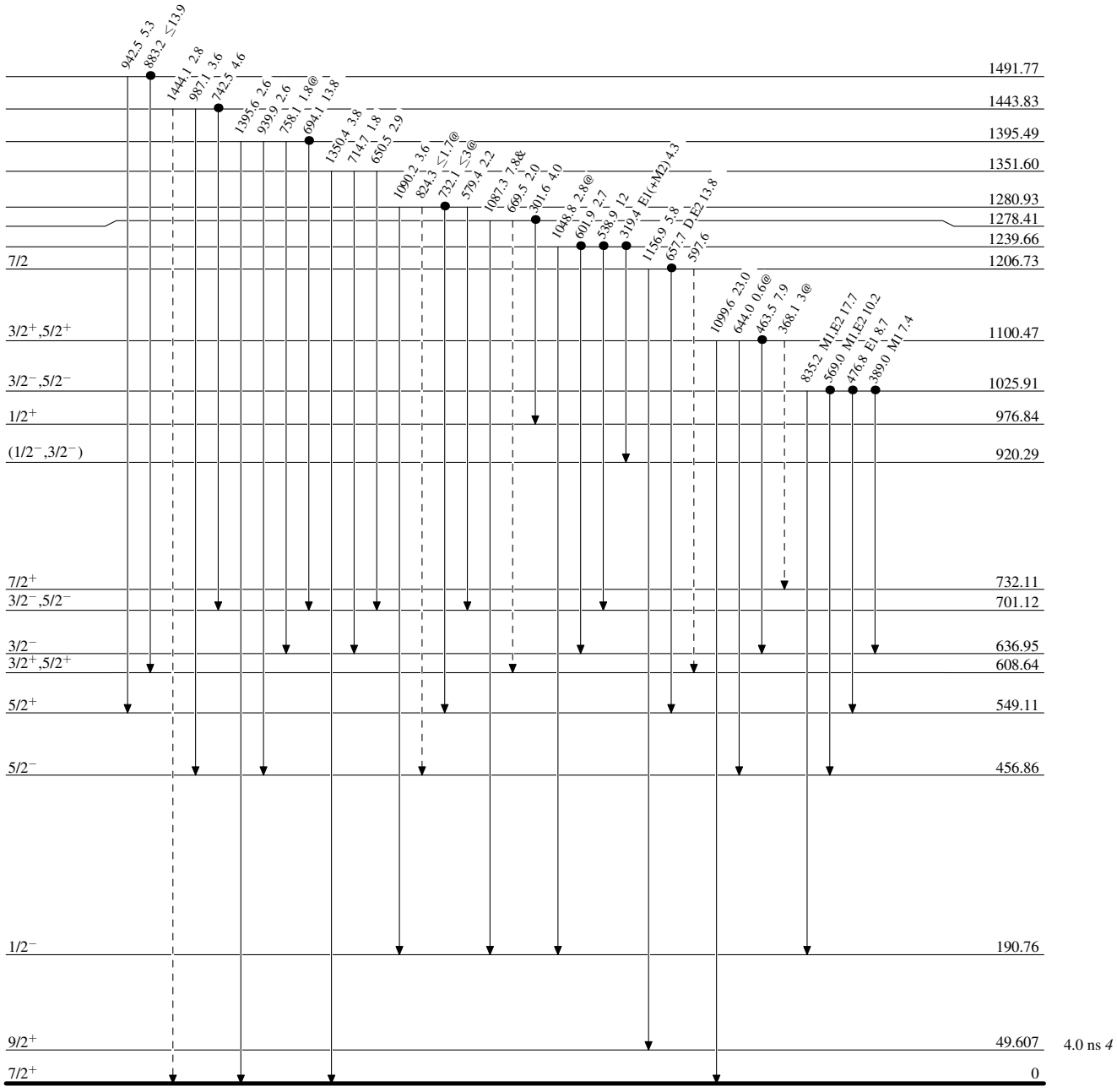
$^{81}_{36}Kr_{45}$

^{81}Br(p,nγ) 1979To08,1977Wi08

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)
Coincidence



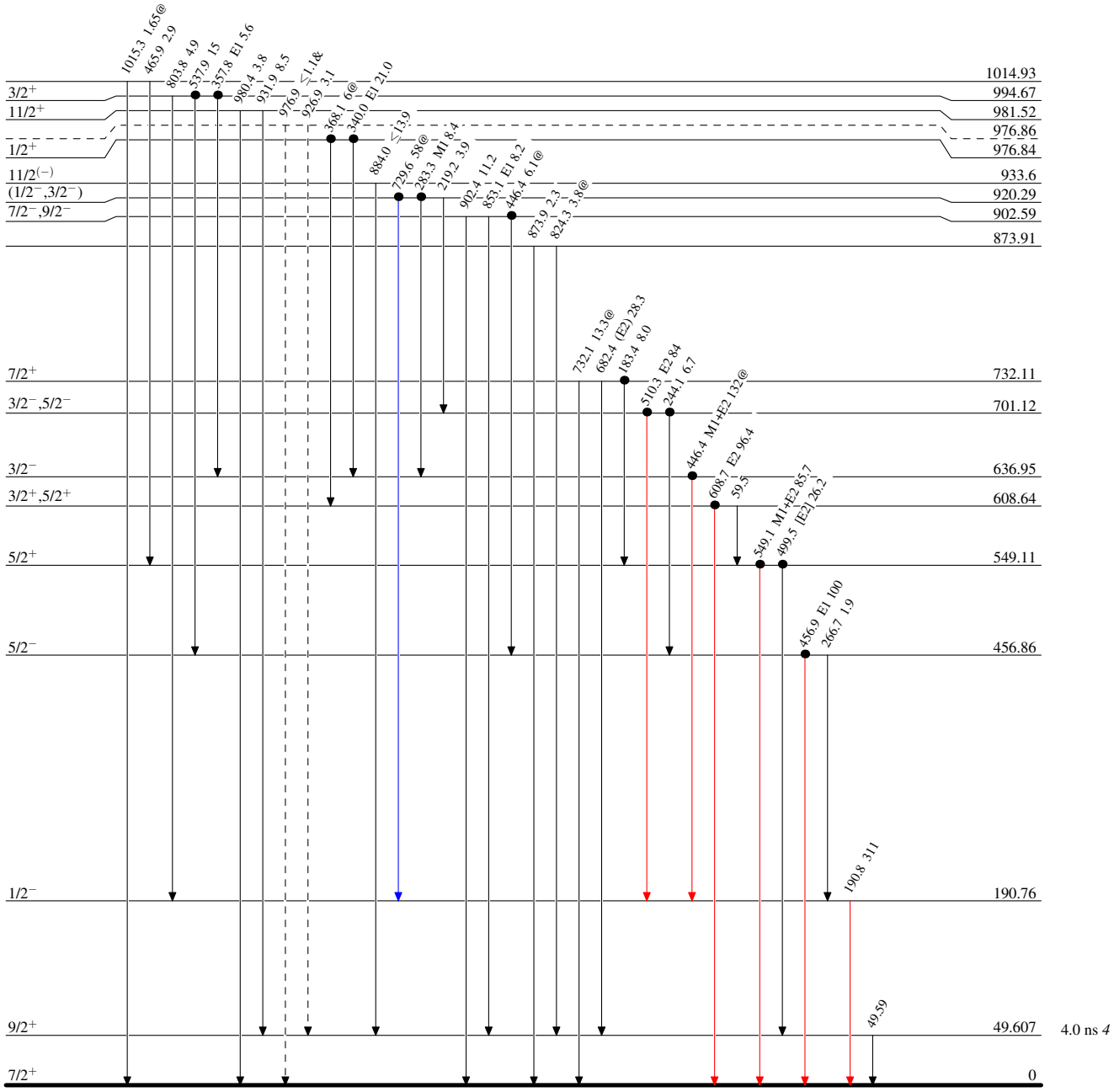
$^{81}_{36}Kr_{45}$

^{81}Br(p,nγ) 1979To08,1977Wi08

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)
Coincidence



$^{81}_{36}Kr_{45}$