^{80}Se(α,2nγ) 1984Ke10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne	NDS 157, 260 (2019)	1-Mar-2019

1984Ke10: E=21 MeV, 23 MeV, 27 MeV. Enriched target. Ge(Li) detectors. Measured Eγ, Iγ, γγ, γ(θ), γ(t), Doppler-shift attenuation (DSA), recoil-distance Doppler-shift, linear polarization.
1983Me08: E=16.0 MeV to 21.3 MeV. Enriched target. Ge(Li), measured Eγ, Iγ, γγ, γ(θ).
1973Wy01: E=25 MeV. Si(Li), measured Ice.
Other: 1971Mc12. M1 transition probabilities are discussed by 1983Ke03.

^{82}Kr Levels

E(level)	J$^{\pi}$†	T$_{1/2}$‡	Comments
0	0^{+}		
776.48 *8*	2^{+}	4.7 ps *7*	T$_{1/2}$: from recoil-distance Doppler-shift.
1474.84 *8*	2^{+}		
1820.47 *10*	4^{+}	1.0 ps *+10−5*	T$_{1/2}$: average of 1.0 ps *+10−6* from recoil-distance and 0.8 ps *+10−4* from DSA.
1956.89 *22*	(2^{+})		
2093.93 *10*	3^{+}		
2426.86 *11*	(4^{+})		
2547.65 *22*	(3^{-})		
2556.11 *13*	(4^{+})		
2648.27 *11*	4^{-}		
2828.02 *11*	5$^{(-)}$	14 ps *7*	T$_{1/2}$: from recoil-distance Doppler-shift.
2919.45 *12*	(6^{+})	2 ps *1*	T$_{1/2}$: 3 ps *+2−1* from recoil-distance, 2 ps *1* from DSA.
3010.91 *13*		2 ps *1*	
3037.71 *13*	(6^{-})	0.58 ns *7*	T$_{1/2}$: from γ(t) (1984Ke10).
3167.43 *13*	(6^{+})	0.76 ps *21*	
3186.84 *23*			
3255.71 *16*	(6^{+})	0.36 ps *10*	
3348.32 *12*	(6^{-})	42 ps *14*	T$_{1/2}$: from recoil-distance Doppler-shift.
3461.44 *22*	(8^{+})	111 ps *10*	T$_{1/2}$: from recoil-distance Doppler-shift.
3496.39 *14*	(7^{-})	14 ps *+14−7*	T$_{1/2}$: from recoil-distance Doppler-shift.
3594.91 *13*	(7^{-})	>7 ps	
3709.15 *20*	(7^{+})	<0.8 ps	
3845.98 *20*			
4016.05 *16*	(8^{+})	1.0 ps *+10−4*	
4033.64 *16*		1.1 ps *+4−2*	
4124.90 *17*	(8^{+})	6 ps *+3−1*	
4170.74 *19*	(8^{-})	2.4 ps *+24−8*	
4342.9 *4*		1.0 ps *+24−3*	
4437.4 *4*		0.17 ps *+8−4*	
4609.28 *22*	(10^{+})	1.2 ps *+7−3*	
4667.70 *20*	(9^{-})	1.1 ps *+4−2*	
4746.60 *25*	(9^{-})	0.6 ps *1*	
4821.93 *18*	(10^{+})	1.2 ps *2*	
4896.5? *11*			
5011.65 *24*	(8^{+},9,10^{+})		
5325.20 *24*	(10^{-})	<1.0 ps	
5702.6 *11*			
5992.3 *4*		0.3 ps *1*	
6009.3 *4*			
6011.4 *4*		0.39 ps *7*	

† From Adopted Levels.
‡ From Doppler-shift attenuation (DSA) and recoil-distance Doppler-shift measurements. If method is not indicated, T$_{1/2}$ is from DSA; all from 1984Ke10.

γ(^{82}Kr)

α(K)exp deduced by the evaluators from Ice measured by 1973Wy01 if the 776.5γ is E2.

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[a]	Comments
88.3[d] 2	0.019[@] 5	3255.71	(6$^+$)	3167.43	(6$^+$)			
92.2 2	0.05[@] 2	2648.27	4$^-$	2556.11	(4$^+$)			
98.5 1	1.1 1	3594.91	(7$^-$)	3496.39	(7$^-$)			
108.8 1	1.1 1	4124.90	(8$^+$)	4016.05	(8$^+$)			
172.0[d] 2	0.13[@] 4	4342.9		4170.74	(8$^-$)			
182.9 1	4.0 2	3010.91		2828.02	5$^{(-)}$			
187.7 2	0.4 1	4033.64		3845.98				
189.7 2	0.2 1	5011.65	(8$^+$,9,10$^+$)	4821.93	(10$^+$)			
209.7 2	0.40 3	3037.71	(6$^-$)	2828.02	5$^{(-)}$			
212.5 2	0.20 2	4821.93	(10$^+$)	4609.28	(10$^+$)			
221.4 2	0.29 3	2648.27	4$^-$	2426.86	(4$^+$)			
246.5 2	0.57 5	3594.91	(7$^-$)	3348.32	(6$^-$)			
247.8[c] 2	0.6[c] 1	3167.43	(6$^+$)	2919.45	(6$^+$)			
247.8[c] 2	0.3[c] 1	3709.15	(7$^+$)	3461.44	(8$^+$)			
271.9 2	0.27 3	2828.02	5$^{(-)}$	2556.11	(4$^+$)			
273.4 3	0.21 3	2093.93	3$^+$	1820.47	4$^+$			
280.6[d] 3	0.10 4	2828.02	5$^{(-)}$	2547.65	(3$^-$)			
310.6 1	0.97 5	3348.32	(6$^-$)	3037.71	(6$^-$)			
312.6[d] 3	0.08[@] 4	4437.4		4124.90	(8$^+$)			
336.2 2	1.1 1	3255.71	(6$^+$)	2919.45	(6$^+$)			
337.4 2	2.8 2	3348.32	(6$^-$)	3010.91				
389.4 1	7.0 3	3037.71	(6$^-$)	2648.27	4$^-$	(E2)	0.00705	α(K)=0.00622 9; α(L)=0.000701 10; α(M)=0.0001134 16 α(N)=1.119×10^{-5} 16
401.1 1	1.3 1	2828.02	5$^{(-)}$	2426.86	(4$^+$)			
415.7 2	1.0 1	4124.90	(8$^+$)	3709.15	(7$^+$)	D	0.00330	α(K)=0.00293 5; α(L)=0.000315 5; α(M)=5.11×10^{-5} 8 α(N)=5.16×10^{-6} 8
421.3[d] 3	0.08[@] 4	4437.4		4016.05	(8$^+$)			
427.5 2	2.5 2	3594.91	(7$^-$)	3167.43	(6$^+$)			
428.9 2	1.1 1	3348.32	(6$^-$)	2919.45	(6$^+$)			
453.3 2	1.5 1	3709.15	(7$^+$)	3255.71	(6$^+$)	D	0.00269	α(K)=0.00239 4; α(L)=0.000257 4; α(M)=4.16×10^{-5} 6 α(N)=4.20×10^{-6} 6
454.8 2	2.3 2	3010.91		2556.11	(4$^+$)			
458.6 2	1.4 1	3496.39	(7$^-$)	3037.71	(6$^-$)			
496.9 2	0.9 2	4667.70	(9$^-$)	4170.74	(8$^-$)			
497.8 3	0.3 1	3845.98		3348.32	(6$^-$)			
520.3 1	3.2 2	3348.32	(6$^-$)	2828.02	5$^{(-)}$			

$^{82}_{36}$Kr$_{46}$-2

γ(^{82}Kr) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#b]	α[a]	Comments
542.0[c]	14.6[c] *10*	3461.44	(8$^+$)	2919.45	(6$^+$)	(E2)		0.00251	α(K)=0.00222 *4*; α(L)=0.000244 *4*; α(M)=3.95×10^{-5} *6* α(N)=3.93×10^{-6} *6*
542.0[c]	1.6[c] *3*	3709.15	(7$^+$)	3167.43	(6$^+$)				
554	1.7 *3*	4016.05	(8$^+$)	3461.44	(8$^+$)				
554.3 *1*	7.7 *8*	2648.27	4$^-$	2093.93	3$^+$	(E1(+M2))	−0.02 *5*	7.59×10^{-4} *23*	α(K)=0.000675 *20*; α(L)=7.15×10^{-5} *22*; α(M)=1.16×10^{-5} *4* α(N)=1.16×10^{-6} *4* δ: or −3.7 *+7−20*.
557.2[d] *3*	0.2[@] *1*	3594.91	(7$^-$)	3037.71	(6$^-$)				
575.8 *3*	1.3 *3*	4170.74	(8$^-$)	3594.91	(7$^-$)				
576.9 *2*	1.2 *3*	3496.39	(7$^-$)	2919.45	(6$^+$)				
584.0[c] *2*	1.1[c] *2*	3010.91		2426.86	(4$^+$)				
584.0[c] *2*	3.2[c] *3*	3594.91	(7$^-$)	3010.91					
606.3 *1*	3.0 *2*	2426.86	(4$^+$)	1820.47	4$^+$	D+Q	+0.1 *+19−4*	0.0014 *4*	α(K)=0.0012 *3*; α(L)=1.31×10^{-4} *36*; α(M)=2.12×10^{-5} *57* α(N)=2.15×10^{-6} *55*
619.0 *1*	7.1 *2*	2093.93	3$^+$	1474.84	2$^+$	(E2+M1)	+3.1 *6*	0.00167 *3*	α(K)=0.00148 *3*; α(L)=0.000161 *3*; α(M)=2.61×10^{-5} *5* α(N)=2.61×10^{-6} *5*
657.4 *3*	0.6 *2*	5325.20	(10$^-$)	4667.70	(9$^-$)				
663.8 *4*	1.3 *1*	4124.90	(8$^+$)	3461.44	(8$^+$)				
668.4 *2*	5.3 *4*	3496.39	(7$^-$)	2828.02	5$^{(-)}$	(E2)		1.38×10^{-3}	α(K)=0.001220 *18*; α(L)=0.0001327 *19*; α(M)=2.15×10^{-5} *3* α(N)=2.15×10^{-6} *3*
675.5 *1*	3.8 *3*	3594.91	(7$^-$)	2919.45	(6$^+$)				
685.3 *1*	0.5 *1*	4033.64		3348.32	(6$^-$)				
698.3 *1*	9.0 *5*	1474.84	2$^+$	776.48	2$^+$	(E2+M1)	+2.7 *+10−5*	1.20×10^{-3} *2*	α(K)exp=0.0017 *13* α(K)=0.001060 *18*; α(L)=0.0001149 *20*; α(M)=1.86×10^{-5} *4* α(N)=1.86×10^{-6} *4*
700.0[d] *3*	0.6[@] *2*	3348.32	(6$^-$)	2648.27	4$^-$				
735.6 *3*	0.2[@] *1*	2556.11	(4$^+$)	1820.47	4$^+$				
760.3 *2*	0.7 *2*	4016.05	(8$^+$)	3255.71	(6$^+$)				
767.1[d] *3*	0.6[@] *2*	3594.91	(7$^-$)	2828.02	5$^{(-)}$				
776.5 *1*	100.0	776.48	2$^+$	0	0$^+$	(E2)		9.23×10^{-4}	α(K)exp=(0.00082) α(K)=0.000819 *12*; α(L)=8.84×10^{-5} *13*; α(M)=1.431×10^{-5} *20* α(N)=1.436×10^{-6} *21*
805.9 *1*	5.0 *1*	4821.93	(10$^+$)	4016.05	(8$^+$)	(E2)		8.39×10^{-4}	α(K)=0.000744 *11*; α(L)=8.03×10^{-5} *12*;

$^{82}_{36}$Kr$_{46}$-3

^{80}Se(α,2nγ) 1984Ke10 (continued)

γ(^{82}Kr) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#b]	α[a]	Comments
									α(M)=1.298×10^{-5} *19*; α(N)=1.304×10^{-6} *19*
822.4 *2*	4.6 *2*	4170.74	(8$^-$)	3348.32	(6$^-$)				
827.8 *1*	2.9 *2*	2648.27	4$^-$	1820.47	4$^+$	(E1(+M2))	+0.2 *+4−2*	3.7×10^{-4} *33*	α(K)=3.3×10^{-4} *29*; α(L)=3.5×10^{-5} *32*; α(M)=5.6×10^{-6} *52*; α(N)=5.6×10^{-7} *52*
848.6 *3*	0.83[@] *4*	4016.05	(8$^+$)	3167.43	(6$^+$)				
886.8 *3*	0.7 *2*	5011.65	(8$^+$,9,10$^+$)	4124.90	(8$^+$)				
952.0 *2*	0.9 *2*	2426.86	(4$^+$)	1474.84	2$^+$				
956	1.0 *5*	5702.6		4746.60	(9$^-$)				
1007.6 *1*	17.7 *9*	2828.02	5$^{(-)}$	1820.47	4$^+$	(E1+M2)	0.00 *3*	2.10×10^{-4}	α(K)=0.000187 *3*; α(L)=1.97×10^{-5} *3*; α(M)=3.18×10^{-6} *5*; α(N)=3.22×10^{-7} *5*
1017.9 *3*	2.0 *5*	3845.98		2828.02	5$^{(-)}$				
1044.0 *1*	77.5 *20*	1820.47	4$^+$	776.48	2$^+$	(E2(+M3))	+0.03 *3*	4.50×10^{-4} *8*	α(K)exp=0.00031 *17*; α(K)=0.000400 *7*; α(L)=4.26×10^{-5} *8*; α(M)=6.90×10^{-6} *12*; α(N)=6.95×10^{-7} *12*; Additional information 1.
1072.8[c] *2*	2.0[c] *6*	2547.65	(3$^-$)	1474.84	2$^+$	D+Q		0.00037 *1*	α=0.00037 *1*; α(K)=0.00037 *1*; δ: +0.8 *1* or −5.7 *24*.
1072.8[c] *2*	4.0[c] *8*	4667.70	(9$^-$)	3594.91	(7$^-$)				
1081.3 *2*	2.8 *3*	2556.11	(4$^+$)	1474.84	2$^+$	(E2)		4.14×10^{-4}	α(K)=0.000368 *6*; α(L)=3.92×10^{-5} *6*; α(M)=6.34×10^{-6} *9*; α(N)=6.39×10^{-7} *9*; Mult.,δ: from 1984Ke10. 1983Me08 deduced M=D+Q and δ=+0.4 *1* or δ=+3.7 *+34−11*.
1092.9 *2*	3.1 *3*	3186.84		2093.93	3$^+$				
1096.6 *2*	10.0 *15*	4016.05	(8$^+$)	2919.45	(6$^+$)	(E2)		4.01×10^{-4}	α(K)=0.000356 *5*; α(L)=3.79×10^{-5} *6*; α(M)=6.14×10^{-6} *9*; α(N)=6.19×10^{-7} *9*
1099.0 *1*	39.0 *20*	2919.45	(6$^+$)	1820.47	4$^+$	(E2)		3.99×10^{-4}	α(K)exp≈0.00029; α(K)=0.000355 *5*; α(L)=3.78×10^{-5} *6*; α(M)=6.11×10^{-6} *9*; α(N)=6.16×10^{-7} *9*
1147.8 *1*	6.1 *3*	4609.28	(10$^+$)	3461.44	(8$^+$)	(E2)		3.65×10^{-4}	α(K)=0.000322 *5*; α(L)=3.42×10^{-5} *5*; α(M)=5.53×10^{-6} *8*; α(N)=5.58×10^{-7} *8*; α(IPF)=2.77×10^{-6} *4*
1154.5 *2*	2.3 *2*	5325.20	(10$^-$)	4170.74	(8$^-$)				
1180.4[&] *2*	1.0[&] *2*	1956.89	(2$^+$)	776.48	2$^+$				
1189.5 *3*	2.5 *3*	6011.4		4821.93	(10$^+$)				

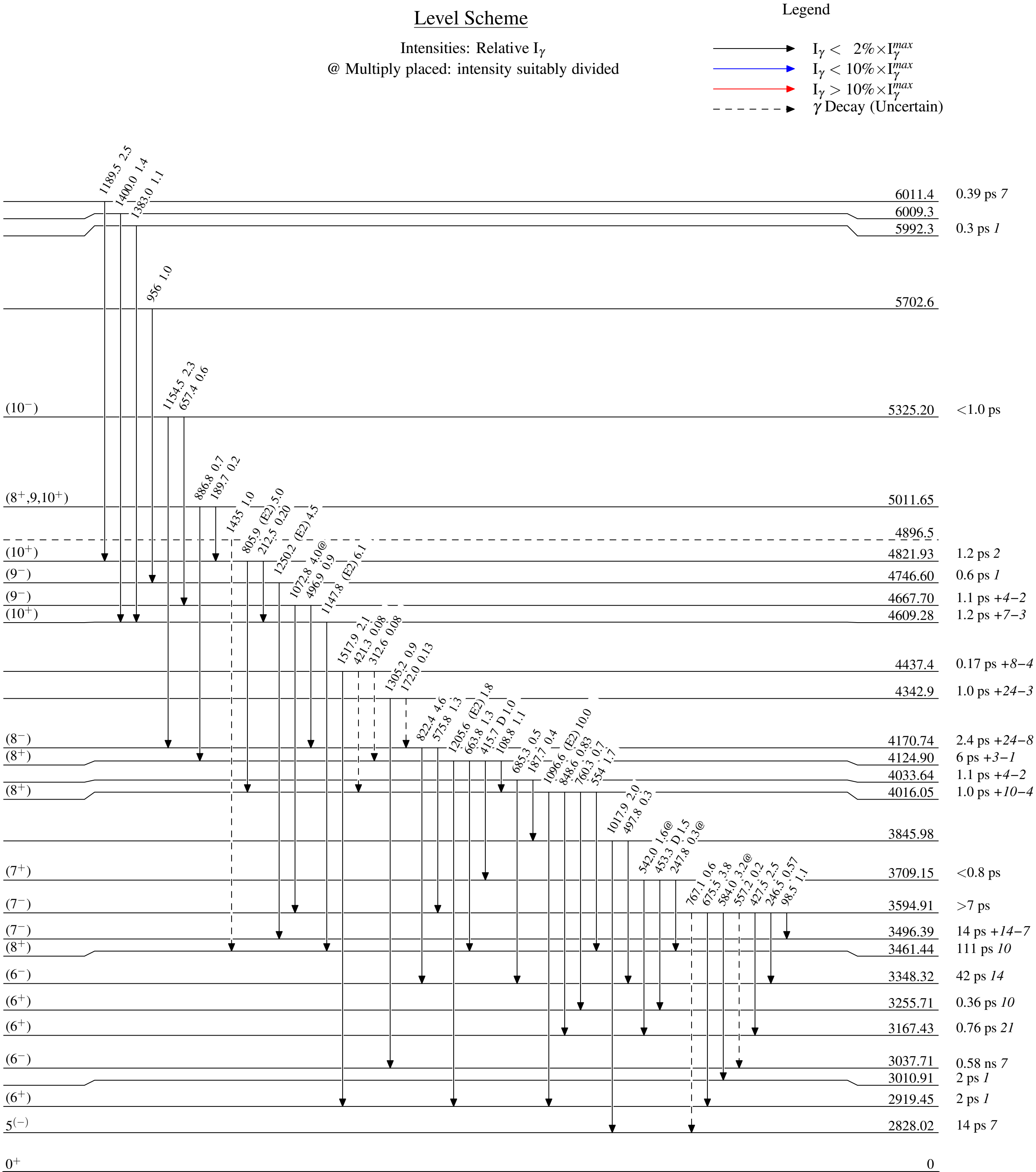
γ(^{82}Kr) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#b]	α[a]	Comments
1205.6 *2*	1.8 *2*	4124.90	(8+)	2919.45	(6+)	(E2)		3.34×10^{-4}	α(K)=0.000289 *4*; α(L)=3.07×10^{-5} *5*; α(M)=4.96×10^{-6} *7* α(N)=5.01×10^{-7} *7*; α(IPF)=9.06×10^{-6} *13*
1250.2 *2*	4.5 *5*	4746.60	(9−)	3496.39	(7−)	(E2)		3.18×10^{-4}	α(K)=0.000267 *4*; α(L)=2.83×10^{-5} *4*; α(M)=4.58×10^{-6} *7* α(N)=4.63×10^{-7} *7*; α(IPF)=1.693×10^{-5} *24*
1305.2 *3*	0.9 *2*	4342.9		3037.71	(6−)				
1317.5 *1*	4.7 *3*	2093.93	3+	776.48	2+	(E2+M1)	+5.7 *+52−17*	3.00×10^{-4}	α(K)=0.000239 *4*; α(L)=2.53×10^{-5} *4*; α(M)=4.09×10^{-6} *6* α(N)=4.14×10^{-7} *6*; α(IPF)=3.15×10^{-5} *5*
1347.0 *1*	6.8 *4*	3167.43	(6+)	1820.47	4+	(E2)		2.96×10^{-4}	α(K)=0.000228 *4*; α(L)=2.42×10^{-5} *4*; α(M)=3.91×10^{-6} *6* α(N)=3.95×10^{-7} *6*; α(IPF)=3.87×10^{-5} *6*
1383.0 *3*	1.1 *3*	5992.3		4609.28	(10+)				
1400.0 *3*	1.4 *5*	6009.3		4609.28	(10+)				
1435[d]	1.0 *5*	4896.5?		3461.44	(8+)				
1435.1 *2*	4.0 *8*	3255.71	(6+)	1820.47	4+				
1474.8 *1*	5.5 *3*	1474.84	2+	0	0+	(E2)		2.89×10^{-4}	α(K)=0.000190 *3*; α(L)=2.00×10^{-5} *3*; α(M)=3.24×10^{-6} *5* α(N)=3.27×10^{-7} *5*; α(IPF)=7.58×10^{-5} *11*
1517.9 *3*	2.1 *3*	4437.4		2919.45	(6+)				
1650.4 *2*	2.7 *5*	2426.86	(4+)	776.48	2+	(E2+M3)	−0.2 *4*	0.00033 *7*	α(K)=1.66×10^{-4} *82*; α(L)=1.75×10^{-5} *89*; α(M)=2.8×10^{-6} *15* α(N)=2.9×10^{-7} *15*; α(IPF)=0.00014 *3*
1779.6 *5*	0.9 *3*	2556.11	(4+)	776.48	2+				

† From 1984Ke10.
‡ Intensity at E=27 MeV, derived from the isotropic term of the angular distribution if not noted otherwise. Intensities of doublets are derived from coincidence measurements (1984Ke10).
# From γ(θ) of 1983Me08 and 1984Ke10. Quadrupole transitions and strong quadrupole admixtures are assumed to be E2.
@ Measured at θ=90° (1984Ke10).
& From 1983Me08.
a Additional information 2.
b If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
c Multiply placed with intensity suitably divided.
d Placement of transition in the level scheme is uncertain.

$^{82}_{36}$Kr$_{46}$-5

$^{80}Se(\alpha,2n\gamma)$ 1984Ke10



$^{82}_{36}Kr_{46}$

^{80}Se(α,2nγ) 1984Ke10

Level Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided