^{82}Se(α,3nγ) 1986Ke12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 125, 201 (2015)	31-Dec-2014

E(α)=36-45 MeV. Measured Eγ, Iγ, γγ, γ(θ), γ lin pol, excitation function using two Ge(Li) detectors and a polarimeter; deduced $T_{1/2}$ from Doppler Shift Attenuation Method (DSAM). γγ and γ(θ) measurements performed at E(α)=42 MeV, DSAM measurements performed at E(α)=27 MeV, and γ lin pol measurements performed at E(α)=36 MeV.

^{83}Kr Levels

E(level)†	Jπ‡	$T_{1/2}$#	Comments
0.0	9/2$^+$		
9.44 *19*	7/2$^+$		
41.3 *5*	1/2$^-$		
690.0 *4*	5/2$^-$		
1011.72 *15*	11/2$^+$		
1102.75 *19*	9/2$^+$		
1122.09 *9*	13/2$^+$		
1170.45 *21*	(7/2$^-$)		
1721.38 *12*	13/2$^+$		
1738.04 *16*	11/2$^+$		
2265.81 *11*	(15/2$^+$)		
2271.3 *3*			
2290.26 *20*			Jπ: 13/2$^-$ proposed by 1986Ke12.
2337.99 *20*	(11/2$^-$)		
2470.41 *14*	(17/2$^-$)		
2478.2 *3*	(15/2$^+$)		
2483.99 *18*	17/2$^+$		
2510.08 *18*	(13/2$^-$)		
2550.94 *17*	17/2$^+$		
2640.58 *16*	(15/2$^-$)		
2841.18 *16*	(17/2$^-$)		
2985.9 *3*	(11/2,13,2,15/2)		Jπ: 15/2$^-$ proposed by 1986Ke12.
3157.49 *18*	(19/2$^-$)	2.8 ps *+14−7*	
3322.0 *4*			
3367.02 *24*	(21/2$^-$)	4 ps *+4−1*	$T_{1/2}$: from E(α)=42 MeV. At E(α)=27 MeV, the author obtain $T_{1/2}$≥5.5 ps.
3411.66 *20*	(21/2$^+$)		
3493.3? *7*			
3603.0 *3*	(21/2$^-$)	1.0 ps *+4−3*	
3685.8 *6*			
3804.4 *6*			
3820.9 *3*			
3906.5 *3*	(19/2$^+$)		
4025.8 *3*	(21/2$^+$)		
4172.4 *3*	(21/2$^+$)		
4218.4 *3*	(23/2$^-$)	0.55 ps *+35−21*	
4585.3 *3*	(23/2$^+$)		
4629.7 *5*			Jπ: (23/2$^-$) proposed by 1986Ke12.
4694.6 *4*	(25/2$^-$)	1.5 ps *+4−3*	
4869.9 *4*	(25/2$^-$)	0.6 ps *1*	
5103.4 *4*	(25/2$^+$)	≤0.4 ps	
5184.0 *4*	(23/2$^+$)		
5641.2 *8*	(27/2$^-$)		
5683.5 *6*	(27/2$^+$)		
5736.0 *5*	(29/2$^-$)		
5778.5 *4*			
6373.5 *12*	(29/2$^+$)	≤0.2 ps	

Continued on next page (footnotes at end of table)

^{82}Se(α,3nγ) 1986Ke12 (continued)

^{83}Kr Levels (continued)

† From a least-squares fit to Eγ, by evaluator.
‡ From the Adopted Levels. When differences are present, the J^π assignments of 1986Ke12 are indicated in the comments.
\# From Doppler Shift Attenuation Method (DSAM). In a pulsed-beam experiment, no levels with $T_{1/2}\geq$0.14 ns were observed.

γ(^{83}Kr)

E_γ	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	Comments
130.5 *1*	145 *15*	2640.58	(15/2⁻)	2510.08	(13/2⁻)	(D+Q)	A_2=−0.30 *2*, A_4=0.00 *2*; POL=−0.4 *2*.
172.1 *1*	116 *9*	2510.08	(13/2⁻)	2337.99	(11/2⁻)	(D+Q)	A_2=−0.28 *2*, A_4=−0.03 *3*; POL=−0.23 *10*.
200.6 *1*	310 *16*	2841.18	(17/2⁻)	2640.58	(15/2⁻)	(D+Q)	A_2=−0.32 *3*, A_4=−0.06 *6*; POL=−0.27 *6*.
204.6 *1*	360 *20*	2470.41	(17/2⁻)	2265.81	(15/2⁺)	E1	A_2=−0.24 *3*, A_4=−0.05 *6*; POL=+0.33 *6*.
238.7 *3*	35[@] *5*	2510.08	(13/2⁻)	2271.3			
[x]242.7 *4*	11 *2*						
266.0 *2*	68 *4*	4172.4	(21/2⁺)	3906.5	(19/2⁺)	(D+Q)	A_2=−0.28 *3*, A_4=+0.01 *6*; POL=−0.15 *10*.
285.1 *2*	75 *4*	2550.94	17/2⁺	2265.81	(15/2⁺)	(D+Q)	A_2=−0.16 *4*, A_4=−0.09 *9*; POL=−0.30 *9*.
316.3 *1*	300 *15*	3157.49	(19/2⁻)	2841.18	(17/2⁻)	(D+Q)	A_2=−0.38 *2*, A_4=−0.01 *3*; POL=−0.14 *3*.
336.1 *3*	40 *8*	3322.0		2985.9	(11/2,13,2,15/2)		A_2=−0.3 *1*.
350.3 *2*	94 *5*	2640.58	(15/2⁻)	2290.26		(D+Q)	A_2=−0.26 *3*, A_4=0.00 *5*; POL=−0.20 *6*.
363.8 *4*	18 *2*	3685.8		3322.0		(D+Q)	A_2=−0.35 *4*, A_4=+0.05 *7*.
370.7 *2*	56 *4*	2841.18	(17/2⁻)	2470.41	(17/2⁻)	E2	A_2=+0.41 *4*, A_4=−0.06 *6*; POL=+0.48 *14*.
374.7 *3*	34 *3*	2640.58	(15/2⁻)	2265.81	(15/2⁺)		A_2=+0.39 *3*, A_4=−0.04 *5*; POL=−0.6 *3*.
[x]389 *1*	≈40[@]						
409.2 *2*	59 *4*	3820.9		3411.66	(21/2⁺)		A_2=+0.3 *1*.
412.9[a] *2*	100[a@] *10*	4585.3	(23/2⁺)	4172.4	(21/2⁺)	(D+Q)	A_2=−0.37 *3*, A_4=−0.03 *7*; POL=−0.10 *9* including contribution from 413γ.
413[a] *1*	23[a@] *6*	3906.5	(19/2⁺)	3493.3?			A_2=−0.37 *3*, A_4=−0.03 *7*; POL=−0.10 *9* including contribution from 412.9γ.
445.6 *2*	230 *12*	3603.0	(21/2⁻)	3157.49	(19/2⁻)	(D+Q)	A_2=−0.42 *3*, A_4=−0.03 *4*; POL=−0.06 *7*.
480.5 *3*	37 *6*	1170.45	(7/2⁻)	690.0	5/2⁻		A_2≈+0.4.
482.4 *4*	21 *4*	3804.4		3322.0			A_2≈−0.2.
[x]484.5 *4*	28 *5*						
518.1 *2*	62 *5*	5103.4	(25/2⁺)	4585.3	(23/2⁺)	(D+Q)	A_2=−0.32 *12*, A_4=0.0 *2*; POL=−0.6 *3*.
527.8 *3*	38 *4*	2265.81	(15/2⁺)	1738.04	11/2⁺	(E2)	A_2=+0.39 *5*, A_4=−0.20 *7*; POL=+0.4 *2*.
544.4 *2*	110 *6*	2265.81	(15/2⁺)	1721.38	13/2⁺	(D+Q)	A_2=−0.41 *4*, A_4=−0.04 *6*; POL=−0.04 *8*.
552.2 *2*	110 *6*	2290.26		1738.04	11/2⁺	(D+Q)	A_2=−0.27 *3*, A_4=+0.07 *4*; POL=+0.18 *7*.
559 *1*	≈24[@]	4585.3	(23/2⁺)	4025.8	(21/2⁺)		
580.1 *5*	38 *6*	5683.5	(27/2⁺)	5103.4	(25/2⁺)	(D+Q)	A_2=−0.6 *1*, A_4=0.0 *2*.
599.4 *3*	49 *3*	1721.38	13/2⁺	1122.09	13/2⁺	(D+Q)	A_2=+0.32 *4*, A_4=−0.09 *6*.
606.6 *5*	≈15[@]	3157.49	(19/2⁻)	2550.94	17/2⁺		
615.3 *2*	110 *20*	4218.4	(23/2⁻)	3603.0	(21/2⁻)	(D+Q)	A_2=−0.36 *5*, A_4=−0.08 *8*.
618.6 *5*	≈40[@]	1721.38	13/2⁺	1102.75	9/2⁺		
635.3 *2*	26 *2*	1738.04	11/2⁺	1102.75	9/2⁺	(D+Q)	A_2=−0.43 *4*, A_4=+0.08 *7*.
648.6 *3*	27 *3*	690.0	5/2⁻	41.3	1/2⁻	(Q)	A_2=+0.2 *1*.
651.4 *3*	34 *3*	4869.9	(25/2⁻)	4218.4	(23/2⁻)		A_2=−0.6 *2*.
687.2 *3*	26 *3*	3157.49	(19/2⁻)	2470.41	(17/2⁻)		A_2=−0.29 *9*.
690 *1*	29 *5*	6373.5	(29/2⁺)	5683.5	(27/2⁺)	(D+Q)	A_2=−0.53 *10*.
709.6 *2*	90 *5*	1721.38	13/2⁺	1011.72	11/2⁺	(D+Q)	A_2=−0.70 *4*, A_4=+0.06 *6*; POL=−0.24 *13*.
761[a]	≈40[a@]	3603.0	(21/2⁻)	2841.18	(17/2⁻)		
761[a]	≈20[a@]	4172.4	(21/2⁺)	3411.66	(21/2⁺)		
771 *1*	≈30[@]	5641.2	(27/2⁻)	4869.9	(25/2⁻)		
772 *1*	≈25[@]	2510.08	(13/2⁻)	1738.04	11/2⁺		
829.5 *3*	59 *6*	2550.94	17/2⁺	1721.38	13/2⁺	E2	A_2=+0.40 *4*, A_4=−0.06 *7*; POL=+0.9 *4*.
860.7 *2*	41 *2*	3411.66	(21/2⁺)	2550.94	17/2⁺	(Q)	A_2=+0.26 *3*, A_4=−0.09 *6*.

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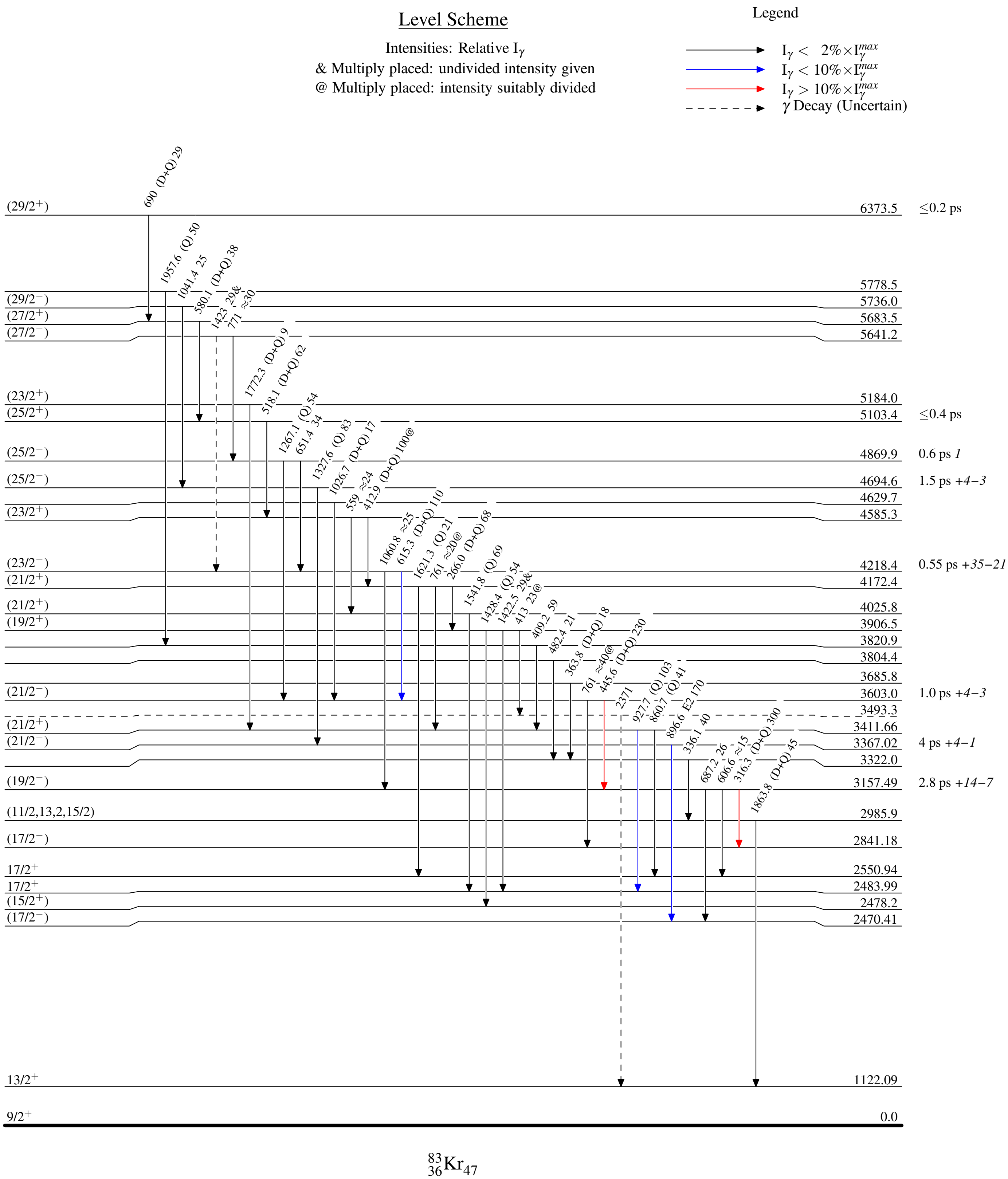
^{82}Se(α,3nγ) 1986Ke12 (continued)

γ(^{83}Kr) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
896.6 2	170 5	3367.02	(21/2⁻)	2470.41	(17/2⁻)	E2	A_2=+0.33 4, A_4=−0.12 6; POL=+0.31 15.
919.2 3	20 2	2640.58	(15/2⁻)	1721.38	13/2⁺	(D+Q)	A_2=−0.34 9, A_4=0.0 2.
927.7 2	103 3	3411.66	(21/2⁺)	2483.99	17/2⁺	(Q)	A_2=+0.31 4, A_4=−0.07 5.
1002.3 5	9 2	1011.72	11/2⁺	9.44	7/2⁺	Q	A_2=+0.3 1.
1011.7 2	170 20	1011.72	11/2⁺	0.0	9/2⁺	(D+Q)	A_2=−0.83 4, A_4=+0.07 6.
1026.7 4	17 2	4629.7		3603.0	(21/2⁻)	(D+Q)	A_2=−0.5 2, A_4=+0.2 3.
1041.4 3	25 5	5736.0	(29/2⁻)	4694.6	(25/2⁻)		A_2=+0.3 1.
1060.8 5	≈25[@]	4218.4	(23/2⁻)	3157.49	(19/2⁻)		
1093.3 2	83[#] 20	1102.75	9/2⁺	9.44	7/2⁺		
1122.1 1	1000	1122.09	13/2⁺	0.0	9/2⁺	E2	Mult.: E2 character used for normalization of γ(θ) and γ-lin pol measurements.
1143.7 1	330 7	2265.81	(15/2⁺)	1122.09	13/2⁺	(D+Q)	A_2=−0.84 4, A_4=+0.04 6; POL=+0.25 7.
1161.0 2	35 3	1170.45	(7/2⁻)	9.44	7/2⁺		A_2=+0.29 6.
1168[&] 1	84[&] 8	2271.3		1102.75	9/2⁺		A_2=+0.19 3, A_4=+0.03 5.
1168[&] 1	84[&] 8	2337.99	(11/2⁻)	1170.45	(7/2⁻)		A_2=+0.19 3, A_4=+0.03 5.
1170.5 3	26 3	1170.45	(7/2⁻)	0.0	9/2⁺	(E1)	A_2=−0.10 6, A_4=−0.07 10; POL=+0.8 6.
1235.3 4	12 1	2337.99	(11/2⁻)	1102.75	9/2⁺		A_2=−0.04 10, A_4=+0.1 2.
1267.1 4	54 5	4869.9	(25/2⁻)	3603.0	(21/2⁻)	(Q)	A_2=+0.41 10, A_4=−0.23 15.
1327.6 3	83 4	4694.6	(25/2⁻)	3367.02	(21/2⁻)	(Q)	A_2=+0.30 5, A_4=−0.14 9.
1356.1 5	31 8	2478.2	(15/2⁺)	1122.09	13/2⁺		A_2=−0.7 2.
1361.9 2	260 15	2483.99	17/2⁺	1122.09	13/2⁺	E2	A_2=+0.36 4, A_4=−0.17 6; POL=+0.9 2.
1422.5[&] 4	29[&] 4	3906.5	(19/2⁺)	2483.99	17/2⁺		A_2=−0.61 16, A_4=+0.2 2 including contribution from 1423γ.
1423[&b]	29[&] 4	5641.2	(27/2⁻)	4218.4	(23/2⁻)		A_2=−0.61 16, A_4=+0.2 2 including contribution from 1422.5γ.
1428.4 3	54 8	3906.5	(19/2⁺)	2478.2	(15/2⁺)	(Q)	A_2=+0.35 6, A_4=−0.16 10.
1466.7 5	13 3	2478.2	(15/2⁺)	1011.72	11/2⁺	Q	A_2=+0.33 10, A_4=−0.12 16.
1519 1	20[@] 5	2640.58	(15/2⁻)	1122.09	13/2⁺	(D+Q)	A_2=−0.33 7, A_4=0.09 12.
1541.8 3	69 7	4025.8	(21/2⁺)	2483.99	17/2⁺	(Q)	A_2=+0.36 7, A_4=−0.05 9.
1621.3 4	21 2	4172.4	(21/2⁺)	2550.94	17/2⁺	(Q)	A_2=+0.47 10, A_4=+0.08 14.
1721.3 2	87 6	1721.38	13/2⁺	0.0	9/2⁺	E2	A_2=+0.35 5, A_4=−0.18 7; POL=+0.7 4.
1728.6 3	48 5	1738.04	11/2⁺	9.44	7/2⁺	E2	A_2=+0.41 4, A_4=−0.12 5; POL=+0.8 5.
1738.0 3	53 3	1738.04	11/2⁺	0.0	9/2⁺	(D+Q)	A_2=−0.60 4, A_4=+0.23 6.
1772.3 4	9 2	5184.0	(23/2⁺)	3411.66	(21/2⁺)	(D+Q)	A_2=−0.82 8, A_4=+0.3 1.
1863.8 3	45 4	2985.9	(11/2,13,2,15/2)	1122.09	13/2⁺	(D+Q)	A_2=−0.13 6, A_4=+0.02 10.
1957.6 3	50 5	5778.5		3820.9		(Q)	A_2=+0.30 10, A_4=+0.02 15.
2371[b]		3493.3?		1122.09	13/2⁺		E_γ: From Figure 5 of 1986Ke12 only, not included in the authors Table 1.

[†] Relative intensities at E(α)=42 MeV, derived from the A_o term of the angular distribution.
[‡] From γ(θ) and γ-ray linear polarization measurements.
[#] Iγ at θ=90°.
[@] Unresolved doublet. Iγ estimated from γγ-coin measurement.
[&] Multiply placed with undivided intensity.
[a] Multiply placed with intensity suitably divided.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{82}Se(α,3nγ) 1986Ke12



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Level Scheme (continued)

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

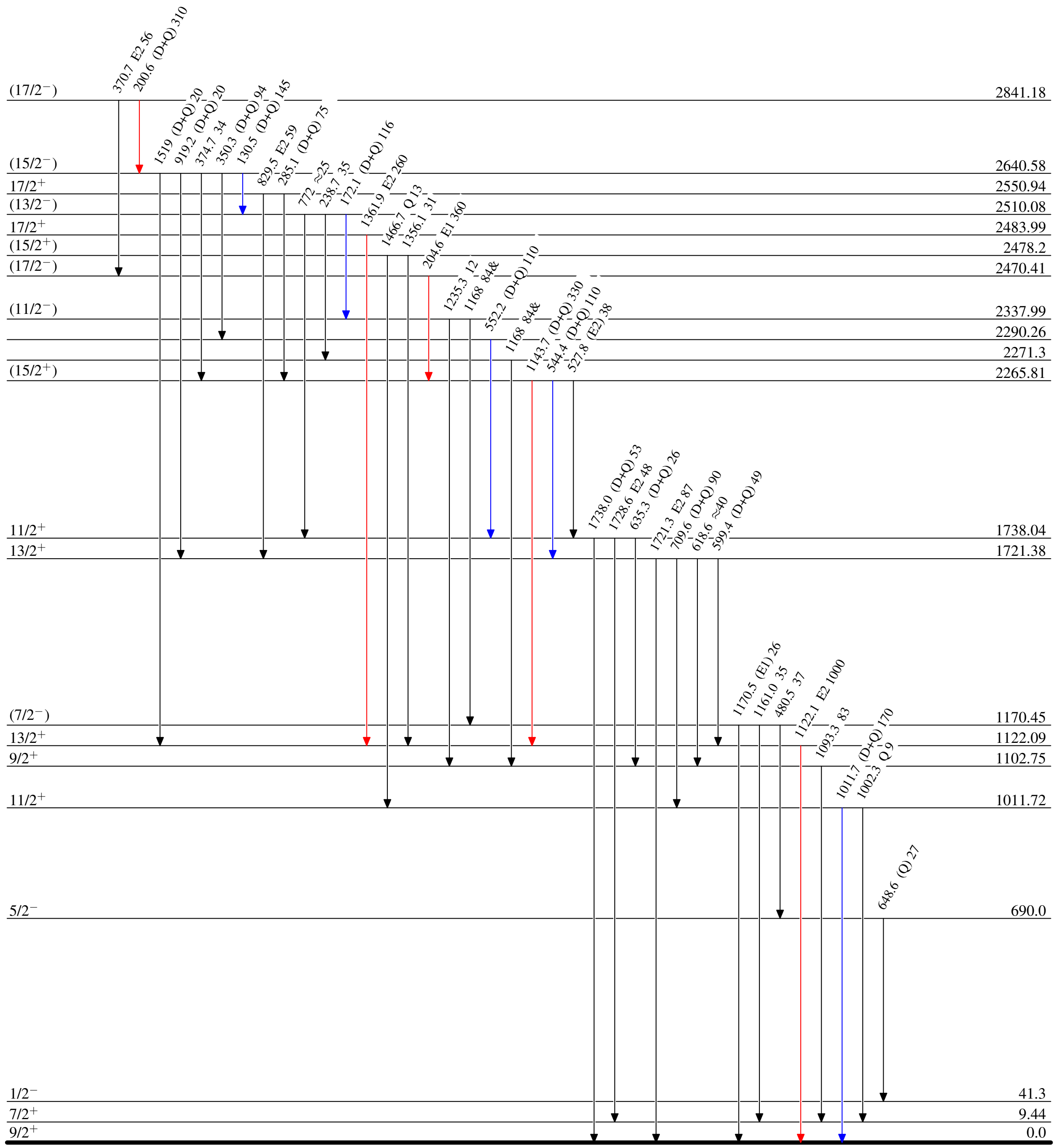
@ Multiply placed: intensity suitably divided

Legend

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

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

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



$^{83}_{36}Kr_{47}$