^{37}Cl(t,pγ)   1973Wa02

	Author	History Citation	Literature Cutoff Date
Type			
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

1973Wa02: E=3.4 MeV triton beam was produced from the Brookhaven National Laboratory 3.5-MeV Van de Graaff accelerator. Target was BaCl$_2$ enriched to 96.1% in ^{37}Cl with a thickness of 520 20 μg/cm^2 evaporated onto a 42 mg/cm^2 Ta foil. Protons were detected with a 1-mm-thick annular surface-barrier detector and γ rays were detected with a coaxial 40-cm^3 Ge(Li) detector. Measured Eγ, Iγ, pγ-coin, Doppler-shift attenuation (DSA). Deduced levels, J, π, T$_{1/2}$, γ-ray branching ratios.

1974McZD: inverse kinematics reaction: ^{3}H(^{37}Cl,pγ), but no details are available.

^{39}Cl Levels

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[‡]	Comments
0	3/2$^+$		
396.42 7	1/2$^+$	>1.4 ps	
1301.47 9	(5/2$^+$)[@]	>2.1 ps	T$_{1/2}$: <2.8 ns from pγ(t).
1695.4 6	5/2$^-$	0.8 ps +10−4	
1722.5 4	5/2$^+$	0.30 ps 6	
1745.12 10	(7/2$^+$)[@]	0.90 ps 28	
1786.10 13	(7/2$^-$)[@]	>1.4 ps	T$_{1/2}$: <2.8 ns from pγ(t).
2060.4 10	5/2$^+$	<35 fs	
2237.9 6	1/2$^+$	55 fs 28	
2423.94 23	(9/2$^+$)[@]	>1.2 ps	
2489.7 4		70 fs 35	
2586.3? 20		<0.21 ps	E(level): level uncertain In 1973Wa02, but group seen In (t,p) spectrum of 1973Wa02 and 1984An03.
2834.57 25	(11/2$^+$)[@]	>1.2 ps	
3115.7 6		0.15 ps 4	
3534.0 6		<0.14 ps	
3907.4? 6			
4050?			
4354.6? 19			

[†] From a least-squares fit to γ-ray energies.
[‡] From 1973Wa02 using DSAM with uncertainties including 15% contribution from stopping powers in the target.
[#] From Adopted Levels, unless otherwise noted.
[@] (not 1/2) from Iγ(0°)/Iγ(90°) ratio significantly different from unity. The numerical values of these ratios, however, are not given in 1973Wa02.

γ(^{39}Cl)

E$_i$(level)	J$^{\pi}_i$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$^{\pi}_f$	E$_i$(level)	J$^{\pi}_i$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$^{\pi}_f$
396.42	1/2$^+$	396.42 7	100	0	3/2$^+$	1745.12	(7/2$^+$)	1348.7[‡]	<4	396.42	1/2$^+$
1301.47	(5/2$^+$)	905.1 3	6 2	396.42	1/2$^+$			1745.03 15	63 4	0	3/2$^+$
		1301.46 10	94 2	0	3/2$^+$	1786.10	(7/2$^-$)	484.61 10	100	1301.47	(5/2$^+$)
1695.4	5/2$^-$	394.0[‡]	<50	1301.47	(5/2$^+$)			1389.7[‡]	<14	396.42	1/2$^+$
		1299.0[‡]	<50	396.42	1/2$^+$			1786.1[‡]	<9	0	3/2$^+$
		1695.4 6	>50	0	3/2$^+$	2060.4	5/2$^+$	274.3[‡]	<16	1786.10	(7/2$^-$)
1722.5	5/2$^+$	421.0	7 5	1301.47	(5/2$^+$)			315.2[‡]	<12	1745.12	(7/2$^+$)
		1326.0 4	49 5	396.42	1/2$^+$			337.9[‡]	<12	1722.5	5/2$^+$
		1722.5 7	44 5	0	3/2$^+$			364.9[‡]	<9	1695.4	5/2$^-$
1745.12	(7/2$^+$)	443.66 10	37 4	1301.47	(5/2$^+$)			758.9[‡]	<11	1301.47	(5/2$^+$)

$^{37}Cl(t,p\gamma)$ **1973Wa02 (continued)**

$\gamma(^{39}Cl)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
2060.4	$5/2^+$	1663.9‡	<10	396.42	$1/2^+$
		2060.3 *10*	100	0	$3/2^+$
2237.9	$1/2^+$	177.6‡	<4	2060.4	$5/2^+$
		492.8‡	<5	1745.12	$(7/2^+)$
		515.5‡	<8	1722.5	$5/2^+$
		542.5‡	<5	1695.4	$5/2^-$
		936.5‡	<4	1301.47	$(5/2^+)$
		1841.4 *7*	77 *6*	396.42	$1/2^+$
		2237.9	23 *6*	0	$3/2^+$
2423.94	$(9/2^+)$	186.0‡	<4	2237.9	$1/2^+$
		363.6‡	<5	2060.4	$5/2^+$
		637.7 *3*	67 *3*	1786.10	$(7/2^-)$
		678.8	9 *3*	1745.12	$(7/2^+)$
		701.5‡	<4	1722.5	$5/2^+$
		728.5‡	<5	1695.4	$5/2^-$
		1122.9 *4*	24 *3*	1301.47	$(5/2^+)$
		2027.5‡	<6	396.42	$1/2^+$
		2423.9‡	<10	0	$3/2^+$
2489.7		251.8‡	<20	2237.9	$1/2^+$
		429.3‡	<4	2060.4	$5/2^+$
		703.6‡	<4	1786.10	$(7/2^-)$
		744.6‡	<4	1745.12	$(7/2^+)$
		767.2‡	<6	1722.5	$5/2^+$
		794.2‡	<5	1695.4	$5/2^-$
		1188.2 *3*	100	1301.47	$(5/2^+)$
		2093.2‡	<7	396.42	$1/2^+$
		2489.6‡	<8	0	$3/2^+$
2586.3?		1284.8 *20*	100	1301.47	$(5/2^+)$
2834.57	$(11/2^+)$	344.9‡	<2	2489.7	
		410.65 *13*	87 *3*	2423.94	$(9/2^+)$
		596.6‡	<2	2237.9	$1/2^+$
		774.2‡	<3	2060.4	$5/2^+$
		1048.5‡	<5	1786.10	$(7/2^-)$
		1089.2 *4*	13 *3*	1745.12	$(7/2^+)$
		1112.1‡	<3	1722.5	$5/2^+$
		1139.1‡	<3	1695.4	$5/2^-$
		1533.1‡	<5	1301.47	$(5/2^+)$
		2438.1‡	<5	396.42	$1/2^+$
		2834.5‡	<5	0	$3/2^+$
3115.7		281.2‡	<15	2834.57	$(11/2^+)$
		626.1‡	<15	2489.7	
		691.8‡	<12	2423.94	$(9/2^+)$
		877.8‡	<12	2237.9	$1/2^+$
		1055.4‡	<15	2060.4	$5/2^+$
		1329.6‡	<35	1786.10	$(7/2^-)$
		1370.6 *5*	100	1745.12	$(7/2^+)$
		1393.3‡	<22	1722.5	$5/2^+$

Continued on next page (footnotes at end of table)

$^{37}Cl(t,p\gamma)$ 1973Wa02 (continued)

$\gamma(^{39}Cl)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f
3115.7		1420.3[‡]	<27	1695.4	$5/2^-$	3534.0		1811.4[‡]	<12	1722.5	$5/2^+$
		1814.2[‡]	<22	1301.47	$(5/2^+)$			1838.5[‡]	<13	1695.4	$5/2^-$
		2719.2[‡]	<25	396.42	$1/2^+$			2232.4	10 8	1301.47	$(5/2^+)$
		3115.6[‡]	<25	0	$3/2^+$			3137.4[‡]	<10	396.42	$1/2^+$
3534.0		418.2[‡]	<4	3115.7				3533.8[‡]	<30	0	$3/2^+$
		699.4[‡]	<4	2834.57	$(11/2^+)$	3907.4?		1483.4[‡] 5		2423.94	$(9/2^+)$
		1044.3[‡]	<5	2489.7				2606.7[‡] 20		1301.47	$(5/2^+)$
		1110.0 5	58 10	2423.94	$(9/2^+)$	4050?		3654[‡]		396.42	$1/2^+$
		1296.0[‡]	<10	2237.9	$1/2^+$			4050[‡]		0	$3/2^+$
		1473.6[‡]	<10	2060.4	$5/2^+$	4354.6?		2567.8[‡] 20		1786.10	$(7/2^-)$
		1747.8[‡]	≤30	1786.10	$(7/2^-)$			3059[‡] 6		1301.47	$(5/2^+)$
		1788.8	32 10	1745.12	$(7/2^+)$						

[†] From 1973Wa02. Values of $E\gamma$ without uncertainties are from level-energy difference. Those γ rays with $I\gamma$ given as upper limit are not adopted in Adopted Gammas, which are from Table III of 1973Wa02 but with no evidence for observation in the measurement.

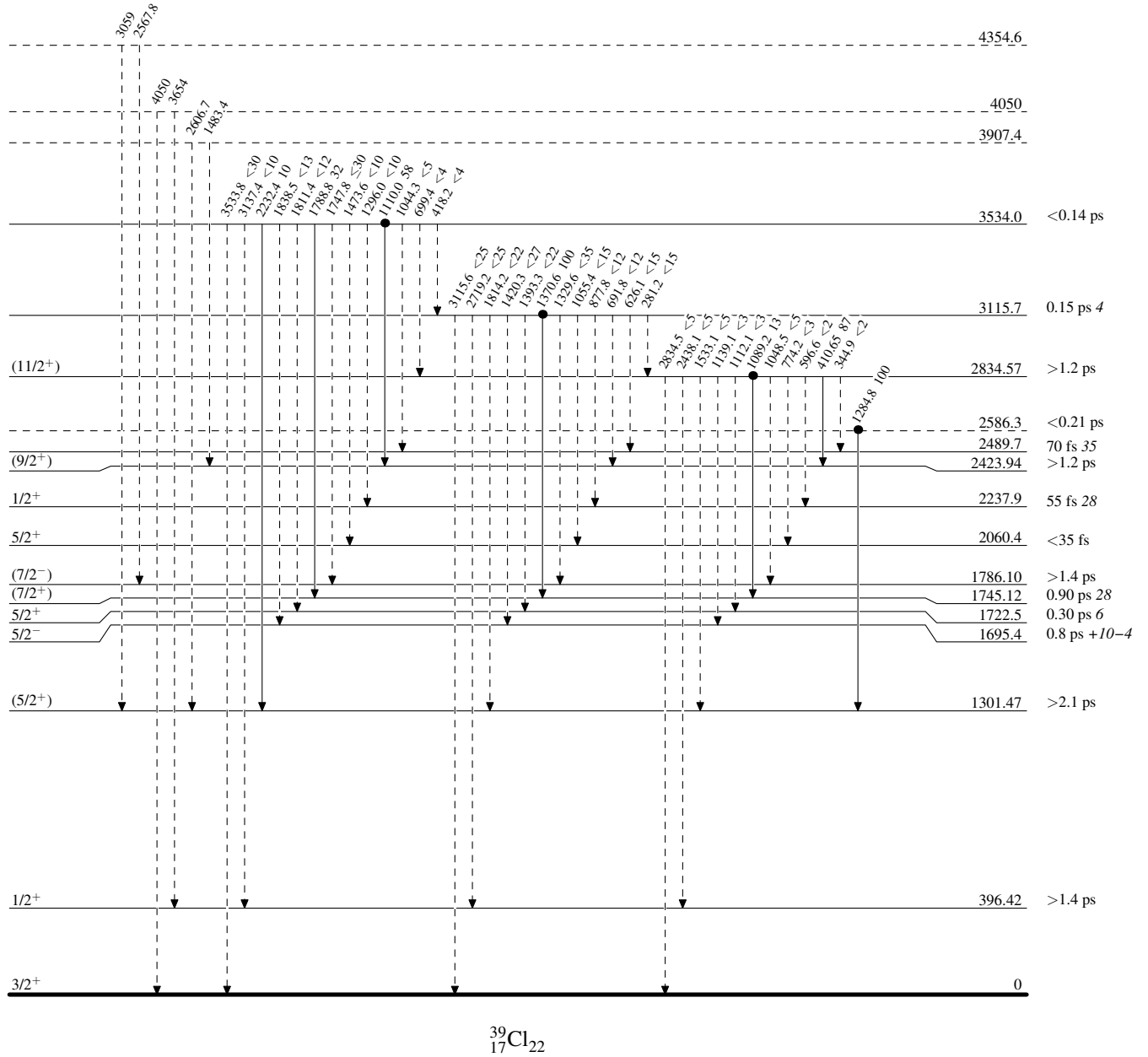[‡] Placement of transition in the level scheme is uncertain.

$^{37}Cl(t,p\gamma)$ **1973Wa02**

Legend

Level Scheme

Intensities: % photon branching from each level

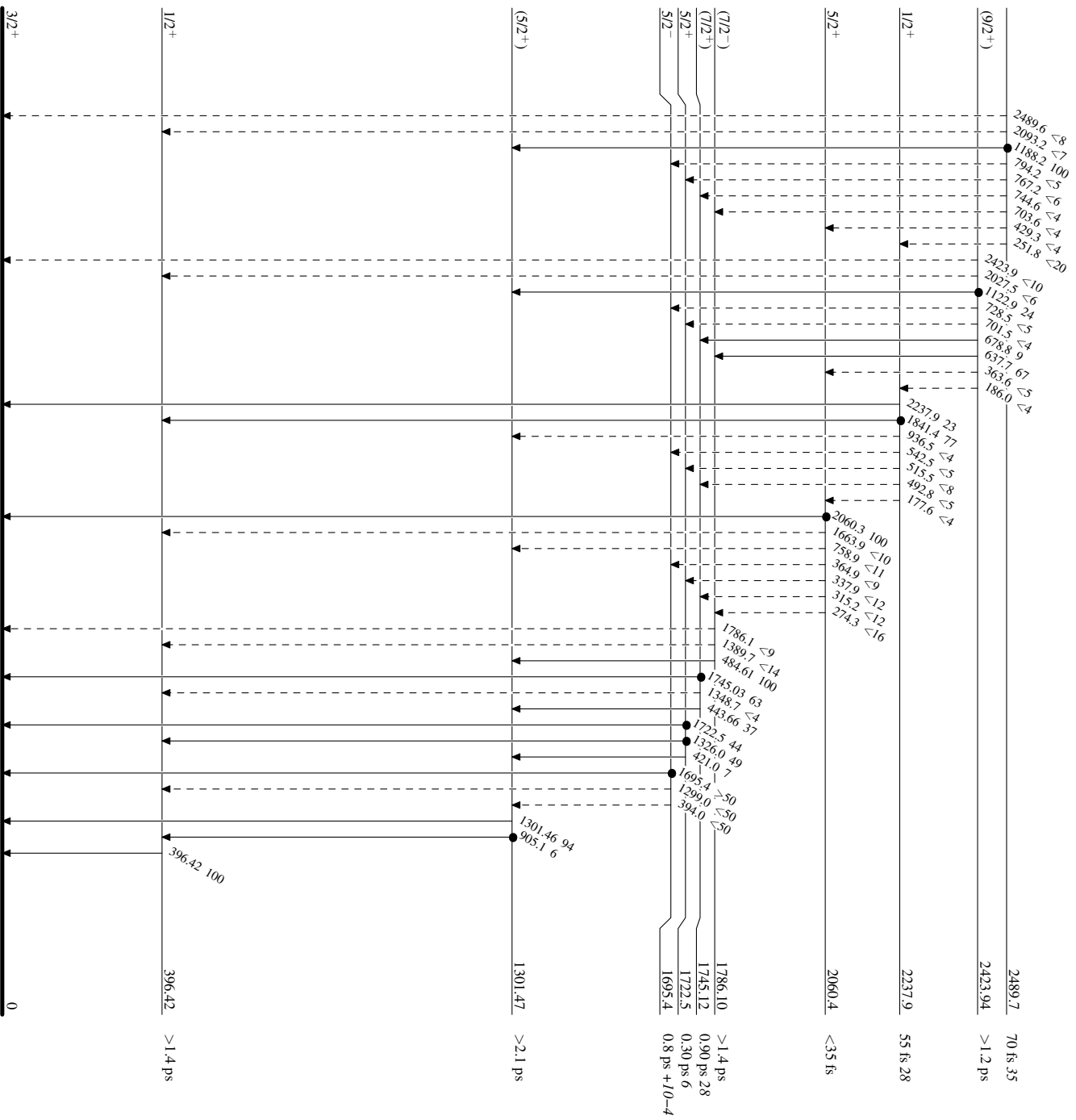- - - - →   γ Decay (Uncertain)
●   Coincidence

$^{39}_{17}Cl_{22}$

From ENSDF

$^{37}\text{Cl}(t,p\gamma)$ **1973Wa02**

Level Scheme (continued)

Legend

Intensities: % photon branching from each level

- - - → γ Decay (Uncertain)

● Coincidence

$^{39}_{17}\text{Cl}_{22}$

$^{39}_{17}\text{Cl}_{22}$-5

(9/2+)

5/2+

1/2+

5/2+

(7/2−)

(7/2+)

5/2+

5/2−

(5/2+)

1/2+

3/2+

2489.6 <8
2093.2 <7
1188.2 100
794.2 <5
767.2 <6
744.6 <4
703.6 <4
429.3 <4
251.8

2423.9 <10
2027.5 <6
1122.9 24
728.5 <5
701.5 <5
678.8 9
637.7 67
363.6 <5
186.0 <4

2237.9 23
1841.4 77
936.5 <4
542.5 <5
515.5 <8
492.8 <5
177.6 <4

2060.3 100
1663.9 <10
758.9 <11
364.9 <9
337.9 <12
315.2 <12
274.3 <16

1786.1 <9
1389.7 <14
484.61 100

1745.03 63
1348.7 <4
443.66 37

1722.5 44
1326.0 49
421.0 7

1695.4 >50
1299.0 <50
394.0 <50

1301.46 94
905.1 6

396.42 100

2489.7   70 fs 35

2423.94   >1.2 ps

2237.9   55 fs 28

2060.4   <35 fs

1786.10   >1.4 ps
1745.12   0.90 ps 28
1722.5   0.30 ps 6
1695.4   0.8 ps +10−4

1301.47   >2.1 ps

396.42   >1.4 ps

0