^{12}C(^{16}O,nγ) 2009Lo05,2009Lo01,1986Ti02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 112, 1875 (2011)	30-Nov-2010

2009Lo01,2009Lo05: Target: ^{12}C; Projectile 60O, E=26 MeV; Detector: GAMMASPHERE array; Measured: Eγ, Iγ, $\gamma\gamma$ coin and γ-γ-γ cube, $\gamma(\theta)$, meanlife by the DSA method.

1986Ti02: Target ^{12}C implanted on tantalum; Projectile: ^{16}O, E=20 MeV; two Ge(Li) detectors; measured Eγ, Iγ, deduced meanlife of levels by the Doppler Shift Method (DSM).

^{27}Si Levels

E(level)[†]	J$^\pi$[&]	$T_{1/2}$[a]	E_p[b]	Comments
0[‡]	5/2$^+$[‡]			
780.9[‡] *2*	1/2$^+$[‡]			
957.4[‡@] *2*	3/2$^+$[‡]	1.20 ps *8*		
2163.6[‡@] *2*	7/2$^+$[‡]	44 fs *5*		
2647.6[‡@] *3*	5/2$^+$[‡]	17.3 fs *21*		
2866.3[#@] *3*		<3.5 fs		
2909.9[‡@] *2*	9/2$^+$[‡]	53 fs *14*		
3540.2[#@] *11*		<4.9 fs		
3803.6[#@] *11*		<6.9 fs		
4138.1[#@] *14*		6 fs *3*		
4289.2[#@] *9*		3.5 fs *14*		
4447.3[‡@] *5*	(11/2$^+$)[‡]	388 fs *40*		
4474.8[‡@] *7*	7/2$^+$,(9/2$^+$)[‡]	<6.9 fs		
4703.8[#@] *11*		<4.9 fs		
5062[#@] *2*		21 fs *6*		
5262.0[#] *5*				
5282.8[‡@] *4*	(7/2,11/2)$^+$[‡]	17 fs *4*		
5316.7[#] *5*				
5501.6[#] *9*				
7469.3 *6*	5/2$^+$		6.0 *6*	
7531.6 *5*	5/2$^+$	<4.2 fs	68.3 *7*	J$^\pi$: L(p)=2 resonance.
7590.1 *1*	9/2$^+$	13.9 fs *21*	126.7 *8*	J$^\pi$: L(p)=0 resonance.
7651.6 *1*	11/2$^+$	8.3 fs *21*	188.6 *4*	
7694.3 *9*	5/2$^+$	<3.5 fs	230.8 *9*	
7704.8 *1*	7/2$^-$	<0.7 fs	241.3 *3*	J$^\pi$: positive parity quoted in 2009Lo01 is a misprint as per e-mail reply from P.J. Woods on November 16, 2009 (an XUNDL database communication).
7738.8 *1*	9/2$^+$	15 fs *3*	276.3 *4*	
7795.2 *19*	7/2$^+$		331.8 *19*	
7831.5 *2*	9/2$^-$	6 fs *4*	368.5 *4*	
7837.9 *2*	1/2$^+$	<0.7 fs	374.6 *3*	
7899.7 *6*	5/2$^+$	10 fs *7*	436.0 *8*	
7909.0 *7*	3/2$^+$		446.1 *7*	
7966.6 *8*	5/2$^+$	8 fs *6*	503.3 *8*	
8031.9 *9*	5/2$^+$		568.5 *11*	
8070 *3*	3/2$^-$		606.6 *30*	
8139.3 *6*	1/2	<0.7 fs	676.0 *6*	Estimated Γ_p=0.054 eV *+41−25*.
8167.3 *12*	11/2$^+$		705.2 *20*	
8183.7 *4*	3/2$^-$	2.8 fs *21*	720.5 *4*	
8200.1 *7*	(1/2,5/2)	9 fs *5*	736.8 *7*	

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$^{12}C(^{16}O,n\gamma)$ 2009Lo05,2009Lo01,1986Ti02 (continued)

^{27}Si Levels (continued)

E(level)[†]	J^{π}[&]	$T_{1/2}$[a]	E_p[b]	Comments
8208.1 *22*	(7/2$^-$)		746.0 *22*	
8344.8 *7*	(7/2)		881.5 *10*	
8375.8 *9*	5/2$^+$	2.1 fs *14*	912.5 *9*	Estimated Γ_p=0.10 eV *+27−5*.

[†] From a least-squares fit to γ-ray energies. Levels below 7469 keV are reported in 1986Ti02, except otherwise noted. Levels above 7469 keV are from 2009Lo05.
[‡] From Adopted Levels.
[#] From Adopted Levels.
[@] Level reported in 1986Ti02.
[&] For levels above 7000 keV, assignments are from 2009Lo05 based on γ(θ), meanlife, and analogy with mirror states in ^{27}Al.
[a] From 1986Ti02 for levels up to 5282-keV, and from 2009Lo05 for 7531-keV level and above. The meanlife reported in 2009Lo05 was measured using the fractional Doppler shift method.
[b] In keV (c.m.). Proton resonance energy deduced from level excitation energies and S(p)=7463.0 *2* (2003Au03) for ^{27}Si.

γ(^{27}Si)

E_γ[†]	E_i(level)	J^{π}_i	E_f	J^{π}_f	Mult.[‡]	Comments
2329.8 *8*	7831.5	9/2$^-$	5501.6			
2371 *4*	7651.6	11/2$^+$	5282.8	(7/2,11/2)$^+$		
2421.6 *4*	7738.8	9/2$^+$	5316.7			
2455.9 *4*	7738.8	9/2$^+$	5282.8	(7/2,11/2)$^+$		
3115.6 *14*	7590.1	9/2$^+$	4474.8	7/2$^+$,(9/2$^+$)		
3142.6 *27*	7590.1	9/2$^+$	4447.3	(11/2$^+$)		
3204.1 *1*	7651.6	11/2$^+$	4447.3	(11/2$^+$)	D+Q	A_2=+0.40 *3*; A_4=−0.01 *4*
3291.3 *1*	7738.8	9/2$^+$	4447.3	(11/2$^+$)		
3383.8 *2*	7831.5	9/2$^-$	4447.3	(11/2$^+$)		
3424.9 *8*	7899.7	5/2$^+$	4474.8	7/2$^+$,(9/2$^+$)		
3719.4 *12*	8167.3	11/2$^+$	4447.3	(11/2$^+$)	D+Q	A_2=+0.21 *7*; A_4=+0.04 *9*
4828.7 *5*	7738.8	9/2$^+$	2909.9	9/2$^+$	D+Q	A_2=+0.25 *12*; A_4=−0.25 *17*
4883.5 *5*	7531.6	5/2$^+$	2647.6	5/2$^+$		
4921.0 *4*	7831.5	9/2$^-$	2909.9	9/2$^+$		A_2=+0.18 *7*; A_4=+0.05 *9*
5056.7 *1*	7704.8	7/2$^-$	2647.6	5/2$^+$	D	A_2=−0.21 *7*; A_4=+0.09 *9*
5261 *4*	8167.3	11/2$^+$	2909.9	9/2$^+$		
5298.3 *22*	8208.1	(7/2$^-$)	2909.9	9/2$^+$		
5384.2 *9*	8031.9	5/2$^+$	2647.6	5/2$^+$		
5425.9 *1*	7590.1	9/2$^+$	2163.6	7/2$^+$		A_2=−0.52 *2*; A_4=+0.01 *3*
5434.0 *19*	8344.8	(7/2)	2909.9	9/2$^+$		
5530.1 *9*	7694.3	5/2$^+$	2163.6	7/2$^+$	D+Q	A_2=+0.50 *7*; A_4=+0.24 *9*
5575.7 *2*	7738.8	9/2$^+$	2163.6	7/2$^+$		A_2=−0.10 *4*; A_4=+0.11 *5*
5631.0 *19*	7795.2	7/2$^+$	2163.6	7/2$^+$	D+Q	A_2=+0.9 *3*; A_4=−0.3 *3*
5668.0 *3*	7831.5	9/2$^-$	2163.6	7/2$^+$		
6180.6 *7*	8344.8	(7/2)	2163.6	7/2$^+$		A_2=+0.33 *9*; A_4=−0.11 *13*
6511.1 *6*	7469.3	5/2$^+$	957.4	3/2$^+$	D+Q	A_2=−0.64 *25*; A_4=+0.4 *3*
6573.5 *9*	7531.6	5/2$^+$	957.4	3/2$^+$	D+Q	A_2=−0.85 *9*; A_4=+0.20 *13*
6879.6 *2*	7837.9	1/2$^+$	957.4	3/2$^+$	D+Q	A_2=−0.29 *3*; A_4=+0.03 *1*
6941.1 *8*	7899.7	5/2$^+$	957.4	3/2$^+$	D+Q	A_2=−0.14 *9*; A_4=−0.02 *12*
7008.2 *8*	7966.6	5/2$^+$	957.4	3/2$^+$		A_2=−0.08 *10*; A_4=−0.03 *13*
7071.6 *19*	8031.9	5/2$^+$	957.4	3/2$^+$	D+Q	A_2=−0.18 *17*; A_4=+0.12 *21*
7112 *3*	8070	3/2$^-$	957.4	3/2$^+$	D+Q	A_2=+0.5 *5*; A_4=+0.3 *5*
7127.1 *7*	7909.0	3/2$^+$	780.9	1/2$^+$	D+Q	A_2=−0.14 *16*; A_4=+0.46 *19*

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$^{12}C(^{16}O,n\gamma)$ 2009Lo05,2009Lo01,1986Ti02 (continued)

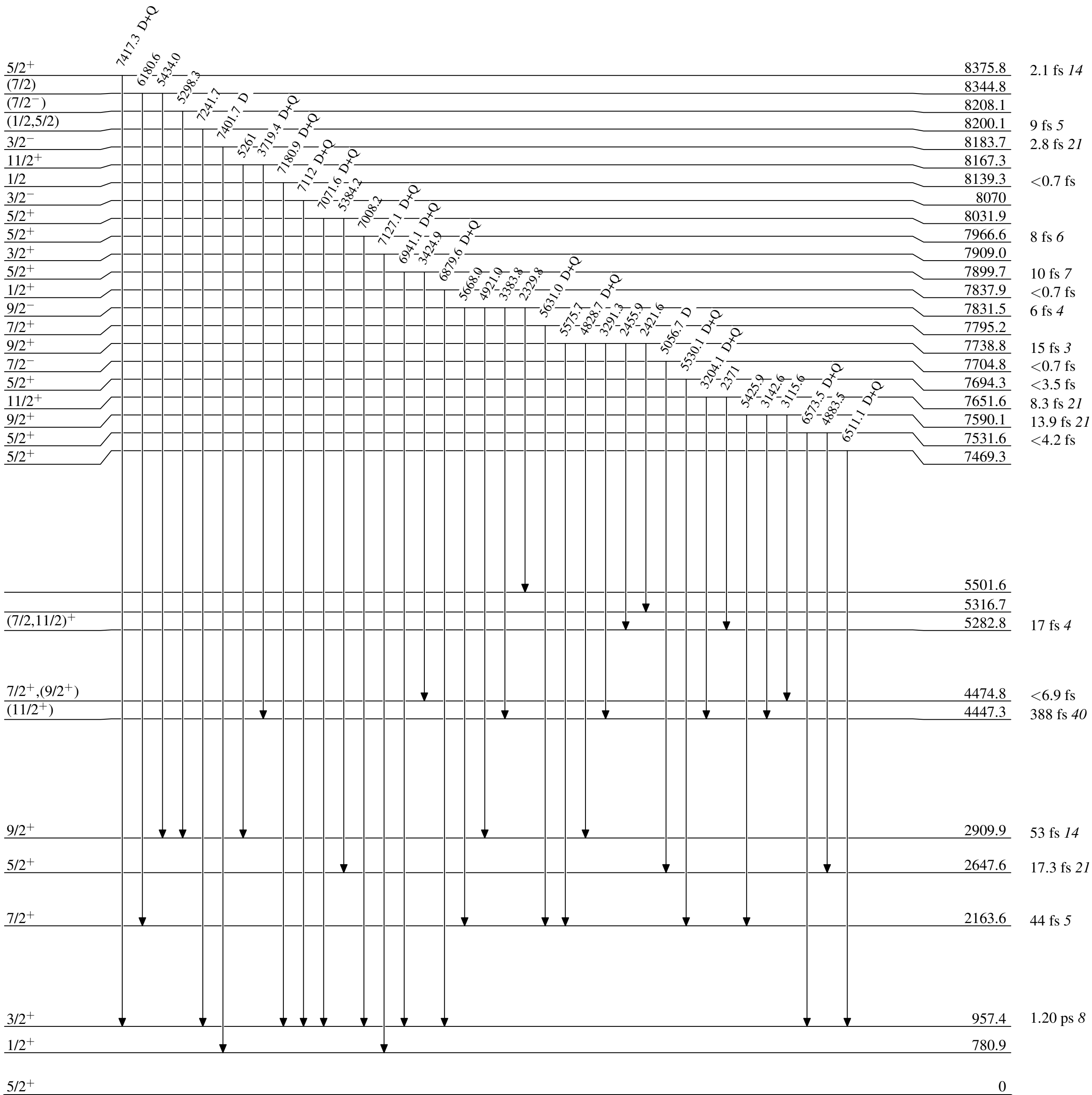
$\gamma(^{27}Si)$ (continued)

E_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	Comments
7180.9 *6*	8139.3	1/2	957.4	$3/2^+$	D+Q	A_2=−0.05 *7*; A_4=+0.20 *9*
7241.7 *7*	8200.1	(1/2,5/2)	957.4	$3/2^+$		A_2=−0.27 *9*; A_4=−0.09 *11*
7401.7 *4*	8183.7	$3/2^-$	780.9	$1/2^+$	D	A_2=−0.04 *9*; A_4=0.00 *12*
7417.3 *9*	8375.8	$5/2^+$	957.4	$3/2^+$	D+Q	A_2=+0.52 *16*; A_4=+0.22 *17*

† γ-rays depopulating levels below the 7469 keV level are from Adopted gammas, and γ-rays depopulating levels including 7469 keV and above are from 2009Lo05.
‡ Assigned by the evaluator based on A2 and A4 values.

$^{12}C(^{16}O,n\gamma)$ 2009Lo05,2009Lo01,1986Ti02

Level Scheme



$^{27}_{14}Si_{13}$