$^{18}O(^{18}O,\alpha n\gamma)$ 2017Ta18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 184, 29 (2022)	24-Jun-2022

Dataset adapted from compiled dataset from 2017Ta18 in the XUNDL database by E.A. McCutchan (NNDC, BNL), July 31, 2017.
2017Ta18: E=24 MeV ^{18}O beam was provided by the Argonne Tandem Linac Accelerator. Target was ^{18}O of 260 $\mu g/cm^2$ thickness on a 12.7 μm Ta backing. Measured Eγ, Iγ, $\gamma\gamma$- and $\alpha\gamma$-coin using Microball, and array of 95 CsI(Tl) scintillators to tag on α particles and the Gammasphere array for γ rays. Comparison with shell model calculations.

^{31}Si Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0	$3/2^+$	
752.24 *18*	$1/2^+$	
1695.01 *24*	$5/2^+$	
2316.5 *10*	$3/2^+$	
2788.2 *5*	$5/2^+$	
3133.6 *4*	$7/2^-$	
3532.4 *15*	$3/2^-$	
3873.7 *8*	$7/2^+$	
4261.1 *15*	$(3/2^+)$	
4382.3 *20*	$3/2^-$	
4716.5 *20*	$1/2^+$	
4943.6 *17*	$(7/2^+)$	
4967.6 *10*	$(9/2^+)$	
4997.4 *10*		
5279.0 *20*	$(1/2)^-$	
5311.5 *15*		
5442.9 *14*		
5451 *3*		
5600.3 *20*		
5611.3 *14*		
5656.3 *20*		
5677.1 *16*		
5791.4 *21*		
5837 *3*		
5856 *3*		
5984.3 *19*		
6250.4 *20*		
6418.4 *20*		E(level): 6422 *3* in 2017Ta18.
6473 *4*		
6584.4 *21*		
6661.8 *15*		
6793.3 *12*		
6887 *3*		
7034.1 *18*		
7111 *3*		
7226.2 *17*		
7485 *3*		
7545 *3*		
7582 *3*		
8360 *3*		
8389 *4*		
8927 *3*		
9217 *3*		
9324 *3*		

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$^{18}O(^{18}O,\alpha n\gamma)$ 2017Ta18 (continued)

^{31}Si Levels (continued)

† From a least-squares fit to Eγ data.
‡ As proposed by 2017Ta18, based on prior literature values, decay patterns and comparison to shell-model calculations. See adopted assignments in Adopted Levels.

γ(^{31}Si)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π
345.3 *5*	0.4 *1*	3133.6	$7/2^-$	2788.2	$5/2^+$
621.5 *15*	0.3 *2*	2316.5	$3/2^+$	1695.01	$5/2^+$
752.2 *2*	15.6 *8*	752.24	$1/2^+$	0.0	$3/2^+$
942.6 *4*	1.2 *4*	1695.01	$5/2^+$	752.24	$1/2^+$
1086.0 *20*	<0.1	3873.7	$7/2^+$	2788.2	$5/2^+$
1093#		2788.2	$5/2^+$	1695.01	$5/2^+$
1093.7 *8*	3.5 *3*	4967.6	$(9/2^+)$	3873.7	$7/2^+$
1124.2 *15*	1.4 *5*	4997.4		3873.7	$7/2^+$
1438.5 *3*	70 *3*	3133.6	$7/2^-$	1695.01	$5/2^+$
1564.6 *20*	0.4 *2*	2316.5	$3/2^+$	752.24	$1/2^+$
1615.0 *12*	1.1 *7*	7226.2		5611.3	
1695.0 *3*	100	1695.01	$5/2^+$	0.0	$3/2^+$
1796.2 *10*	0.6 *5*	6793.3		4997.4	
1864.1 *15*	10.5 *10*	4997.4		3133.6	$7/2^-$
2037.7 *30*	0.5 *2*	2788.2	$5/2^+$	752.24	$1/2^+$
2066.4 *15*	<0.8	7034.1		4967.6	$(9/2^+)$
2111 *2*	0.8 *3*	5984.3		3873.7	$7/2^+$
2155 *2*	1.9 *2*	4943.6	$(7/2^+)$	2788.2	$5/2^+$
2173 *2*	2.8 *15*	7485		5311.5	
2177.9 *15*	16 *4*	5311.5		3133.6	$7/2^-$
2179.2 *15*	6.6 *5*	3873.7	$7/2^+$	1695.01	$5/2^+$
2180 *2*	3.8 *20*	4967.6	$(9/2^+)$	2788.2	$5/2^+$
2315.7 *20*	1.8 *3*	2316.5	$3/2^+$	0.0	$3/2^+$
2478.0 *15*	6.2 *8*	5611.3		3133.6	$7/2^-$
2548.0 *25*	0.7 *3*	6418.4		3873.7	$7/2^+$
2654.6 *15*	3.2 *5*	5442.9		2788.2	$5/2^+$
2780.0 *15*	6.0 *25*	3532.4	$3/2^-$	752.24	$1/2^+$
2787.7 *35*	0.6 *3*	6661.8		3873.7	$7/2^+$
2788.3 *12*	17 *3*	2788.2	$5/2^+$	0.0	$3/2^+$
2888.7 *15*	2.6 *5*	5677.1		2788.2	$5/2^+$
3003 *2*	1.5 *2*	5791.4		2788.2	$5/2^+$
3016 *4*	0.7 *4*	6887		3873.7	$7/2^+$
3048 *2*	0.8 *5*	8360		5311.5	
3126.0 *25*	<0.5	5442.9		2316.5	$3/2^+$
3249 *3*	2.1 *2*	4943.6	$(7/2^+)$	1695.01	$5/2^+$
3274 *3*	1.3 *3*	4967.6	$(9/2^+)$	1695.01	$5/2^+$
3508.6 *15*	0.8 *2*	4261.1	$(3/2^+)$	752.24	$1/2^+$
3539 *3*	<0.5	5856		2316.5	$3/2^+$
3615 *2*	1.5 *10*	8927		5311.5	
3629.8 *20*	1.9 *2*	4382.3	$3/2^-$	752.24	$1/2^+$
3658 *2*	1.5 *10*	6793.3		3133.6	$7/2^-$
3708‡ *3*	0.5 *3*	7582		3873.7	$7/2^+$
3756 *3*	1.1 *4*	5451		1695.01	$5/2^+$
3796 *3*	0.3 *2*	6584.4		2788.2	$5/2^+$
3873.7 *22*	0.3 *2*	6661.8		2788.2	$5/2^+$
3874.2 *15*	6.4 *5*	3873.7	$7/2^+$	0.0	$3/2^+$
3905 *2*	0.6 *4*	5600.3		1695.01	$5/2^+$
3961 *2*	1.1 *4*	5656.3		1695.01	$5/2^+$

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$^{18}O(^{18}O,\alpha n\gamma)$ 2017Ta18 (continued)

$\gamma(^{31}Si)$ (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π
3964 *2*	0.9 *1*	4716.5	$1/2^+$	752.24	$1/2^+$	4526.4 *20*	1.5 *5*	5279.0	$(1/2)^-$	752.24	$1/2^+$
4091 *3*	0.5 *3*	7226.2		3133.6	$7/2^-$	4555 *2*	0.9 *2*	6250.4		1695.01	$5/2^+$
4141.2 *25*	3.9 *4*	5837		1695.01	$5/2^+$	4718 *3*	0.3 *1*	6418.4		1695.01	$5/2^+$
4156 *4*	<0.5	6473		2316.5	$3/2^+$	4756 *3*	0.2 *1*	7545		2788.2	$5/2^+$
4249 *3*	<0.5	9217		4967.6	$(9/2^+)$	4794 *3*	<0.5	7111		2316.5	$3/2^+$
4287 *4*	1.3 *3*	5984.3		1695.01	$5/2^+$	4889 *3*	0.8 *2*	6584.4		1695.01	$5/2^+$
4356 *3*	<0.5	9324		4967.6	$(9/2^+)$	4966.2 *22*	1.5 *3*	6661.8		1695.01	$5/2^+$
4515 *4*	0.4 *3*	8389		3873.7	$7/2^+$	5189 *4*	0.5 *2*	6887		1695.01	$5/2^+$

† From 2017Ta18.
‡ Uncertainty of 23 keV given in Table I of 2017Ta18 seems a misprint.
# Placement of transition in the level scheme is uncertain.

$^{18}O(^{18}O,\alpha n\gamma)$ 2017Ta18

Level Scheme

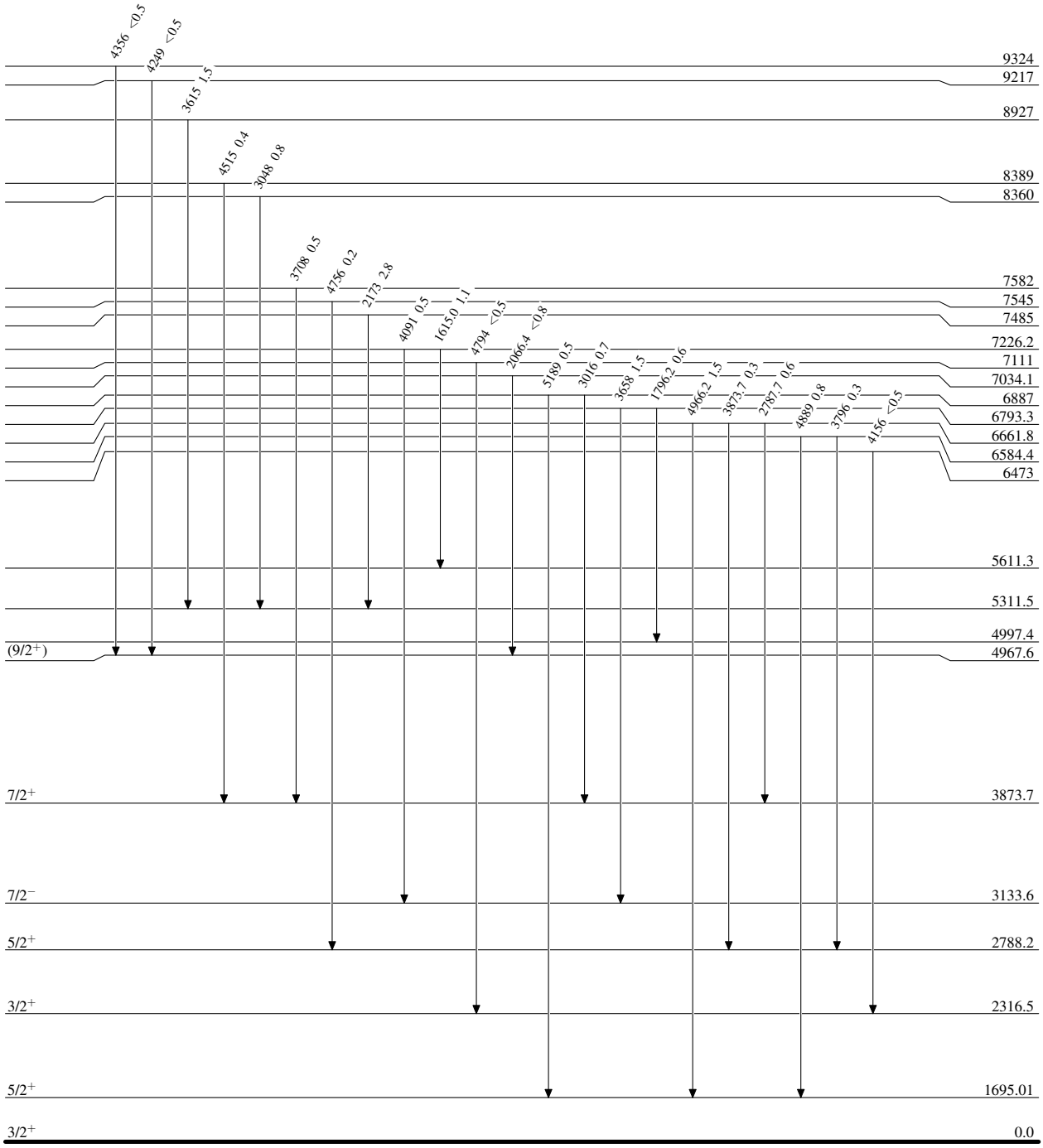
Intensities: Relative I_γ

Legend

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

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

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



$^{31}_{14}Si_{17}$

$^{18}O(^{18}O,\alpha n\gamma)$ **2017Ta18**

Level Scheme (continued)

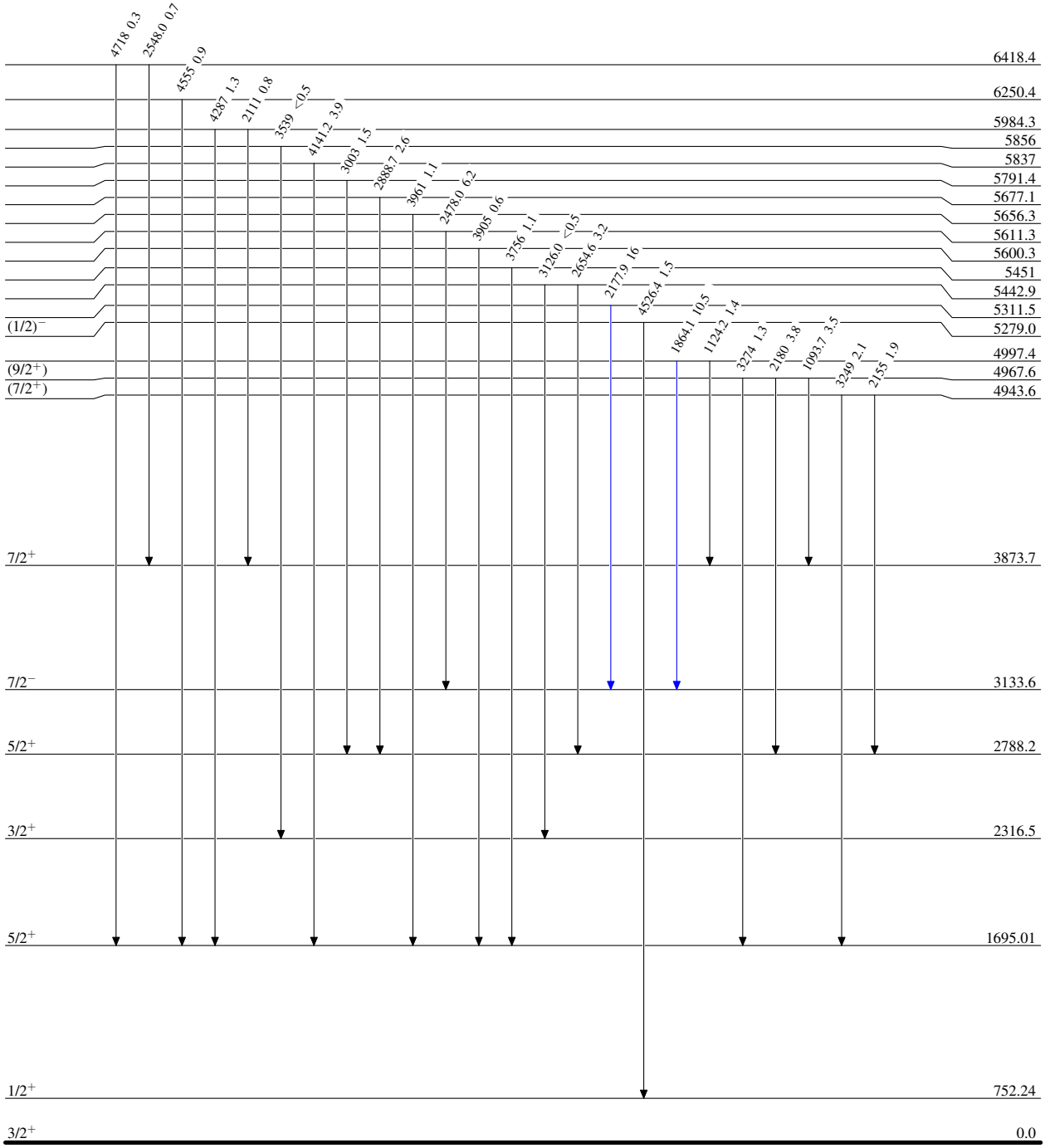
Intensities: Relative I_γ

Legend

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

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

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



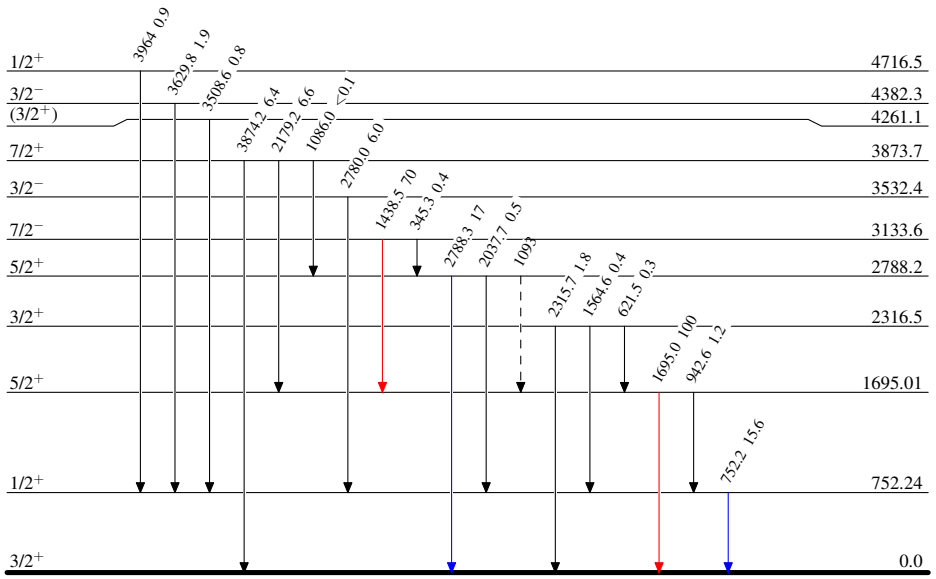
$^{31}_{14}Si_{17}$

$^{18}O(^{18}O,\alpha n\gamma)$ **2017Ta18**

Level Scheme (continued)

Intensities: Relative I_γ

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)



$^{31}_{14}Si_{17}$