^{34}S(^{3}He,α),(^{3}He,$\alpha\gamma$) 1968Du04,1970Le14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 199,1 (2025)	30-Sep-2024

1968Du04: (^{3}He,$\alpha\gamma$) E(^{3}He)=7 and 12 MeV ^{3}He beams were produced from the ONR-CIT tandem accelerator. Targets were about 200 μg/cm^2 enriched ^{34}S (85%) evaporated onto thin gold backings. Reaction products were momentum-analyzed with a double-focusing magnetic spectrometer and detected with an array of 16 solid-state counters; γ rays were detected with a 12.7 cm by 12.7 cm NaI(Tl) crystal. Measured σ(E$_\alpha$,θ) ($\theta_{c.m.}\approx$5° to 65°), Eγ, Iγ, $\alpha\gamma$-coin. Deduced levels, L, J, π from the DWBA analysis of the data.

1970Le14: ^{34}P(^{3}He,α) E=12 MeV ^{3}He beam was produced from the Utrecht 6 MV tandem accelerator. Targets were 50 and 100 μg/cm^2 enriched ^{34}S (85%) evaporated onto thin carbon plus formvar backings. Reaction products were momentum-analyzed with a split-pole magnetic spectrograph (FWHM=15 keV) and detected with 9 position-sensitive state counters. Measured σ(E$_\alpha$,θ), $\theta_{c.m.}$=5° to 95°. Deduced levels, J, π, L-transfers, spectroscopic factors from the DWBA analysis of the data.

1971Sn01: (^{3}He,$\alpha\gamma$) E=6.8 MeV ^{3}He beam was produced from the Brookhaven National Laboratory 3.5-MeV Van de Graaff accelerator. Target was natural sulfur. γ rays were detected with a coaxial Ge(Li) detector. Measured Eγ.

^{33}S Levels

Spectroscopic factor $C^2S=\sigma(\theta)_{exp}/\sigma(\theta)_{DWBA}/(N\times g)$, where N is the normalization factor and $g=(2J_f+1)/(2J_i+1)$.

E(level)[†]	J$^\pi$	L[@]	C^{2}S[#]	Comments
0.0		2[a]	1.90	
840.91 *5*		0	0.65	E(level): from Eγ. Other: 842 *7* (1968Du04).
1964 *10*	5/2$^+$[‡]		<0.05	
2316 *10*		2	0.24	
2870 *10*		2	0.90	L: (2) in 1968Du04.
2950		3	0.15	E(level): doublet (1968Du04); the higher-energy component could correspond to 2970 level from 1970Le14. L: (3) in 1968Du04.
2970	7/2$^+$[‡]		0.07	E(level): reported in 1970Le14 only.
3225 *10*		1	0.01	
3837 *10*		2[a]	0.50	L: (3) in 1968Du04.
3935 *10*		2[a]	0.07	
4934 *20*		1[a]	0.03	
5176 *20*		(3)[&]		
5285 *20*		(2)[&]		E(level): doublet (1968Du04).
5391 *20*				
5479 *15*		0	0.47	T=3/2
5620 *15*		0	0.05	
5720 *20*				
5981 *15*		(1)[&]		
6361 *20*		2	0.23	
6900 *20*		(2)[&]		T=3/2
7348 *20*		(3)[&]		T=3/2
7450 *20*				

[†] From 1968Du04, unless otherwise noted.
[‡] Assumed for the purpose of deducing C^{2}S (1970Le14).
[#] From 1970Le14.
[@] From both 1968Du04 and 1970Le14, otherwise noted.
[&] From 1968Du04 only.
[a] From 1970Le14 only.

^{34}S(^{3}He,α),(^{3}He,$\alpha\gamma$) 1968Du04,1970Le14 (continued)

$\gamma(^{33}S)$

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	Comments
840.91		840.91 *5*		0.0	E_γ: from 1971Sn01.
1964	5/2$^+$	1965‡		0.0	
2950		2950		0.0	
5479		2529	15	2950	
		4637	70	840.91	
		5479	15	0.0	

† From 1968Du04, unless otherwise noted.
‡ Placement of transition in the level scheme is uncertain.

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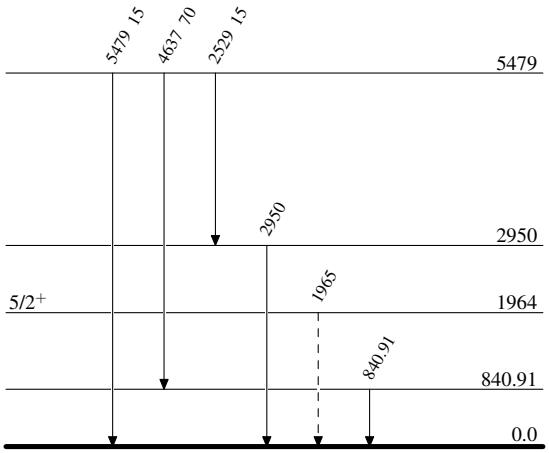
Legend

Level Scheme

Intensities: % photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{33}_{16}S_{17}$