

$^{26}\text{Mg}(^{13}\text{C}, 2n\alpha\gamma)$ **2016Fu09**

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

2016Fu09: E=46 MeV ^{13}C beam was produced from the FN Tandem accelerator at the Institute for Nuclear Physics in Cologne. Target was 0.22 mg/cm² ^{26}Mg on a 66 mg/cm² thick Bi backing with additional 1 mg/cm² In layer plus an 108 mg/cm² Cu layer for heat dissipation. γ rays were detected with the High-efficiency Observatory for γ -ray Unique Spectroscopy (HORUS), consisting of 14 HPGe detectors. Measured E_γ , I_γ , $\gamma\gamma$ -coin, $\gamma\gamma(\theta)$. Deduced levels, J, π , γ -ray branching ratios. Comparisons with shell-model calculations.

 ^{33}S Levels

E(level) [†]	J π [‡]	T _{1/2}	Comments
0.0	3/2 ⁺		
840.6 5	1/2 ⁺		
1967.0 4	5/2 ⁺		
2934.5 5	7/2 ⁻		
2969.0 6	7/2 ⁺		
4048.5 6	9/2 ⁺		
4095.3 8	7/2 ⁺		
4729.9 9	9/2 ⁻		
4866.7 9	11/2 ⁻		
5479.4 8			
5793.4 12			
7000.0 8		>0.7 ps	T _{1/2} : $\tau > 1$ ps is expected with a typical stopping time >1.3 ps of recoils in Bi backing, since all de-exciting transitions were observed without significant Doppler broadening (2016Fu09).
7179.8 22	(11/2 ⁺)		
7821 4	15/2 ⁻		
8641.2 16		<0.7 ps	T _{1/2} : $\tau < 1$ ps due to observed Doppler-shift attenuation effects of 1641 γ (2016Fu09).
9814.4 18			

[†] From a least-squares fit to γ -ray energies.

[‡] As given in **2016Fu09**, taken from literature. **2016Fu09** state that due to limited statistics it was not possible to perform $\gamma\gamma(\theta)$ measurement for spin assignment.

 $\gamma(^{33}\text{S})$

E _i (level)	J π _i	E γ [†]	I γ [†]	E _f	J π _f
840.6	1/2 ⁺	840.6 6	100 4	0.0	3/2 ⁺
1967.0	5/2 ⁺	1126.3 7	1.5 1	840.6	1/2 ⁺
		1966.9 4	100.0 2	0.0	3/2 ⁺
2934.5	7/2 ⁻	967.5 4	100.0 7	1967.0	5/2 ⁺
		2934.4 8	90.1 11	0.0	3/2 ⁺
2969.0	7/2 ⁺	1002.0 8	13.1 18	1967.0	5/2 ⁺
		2968.9 12	100.0 22	0.0	3/2 ⁺
4048.5	9/2 ⁺	1079.5 8	32.8 25	2969.0	7/2 ⁺
		1113.6 10	6.1 19	2934.5	7/2 ⁻
		2081.5 6	100.0 31	1967.0	5/2 ⁺
4095.3	7/2 ⁺	2128.2 11	100 9	1967.0	5/2 ⁺
4729.9	9/2 ⁻	1760.9 11	100.0 39	2969.0	7/2 ⁺
		1795 2	20.3 29	2934.5	7/2 ⁻
4866.7	11/2 ⁻	1932.1 10	100 8	2934.5	7/2 ⁻
5479.4		1383.7 10	29.2 61	4095.3	7/2 ⁺
		2510.5 12	100 8	2969.0	7/2 ⁺
		2545 2	70.1 72	2934.5	7/2 ⁻

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(^{13}\text{C}, 2n\alpha\gamma)$ [2016Fu09](#) (continued) $\gamma(^{33}\text{S})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Comments
5793.4		1063.4 8	100 5	4729.9	9/2 ⁻	
7000.0		1520.3 8	82.3 58	5479.4		
		2133.2 11	71.5 68	4866.7	11/2 ⁻	
		2269.9 10	84.4 61	4729.9	9/2 ⁻	
		2905 [‡]		4095.3	7/2 ⁺	E_γ : from level-scheme in Fig. 4 of 2016Fu09 , not listed in Table 1.
		2951.3 12	100 6	4048.5	9/2 ⁺	
7179.8	(11/2 ⁺)	2313 2	100 8	4866.7	11/2 ⁻	
7821	15/2 ⁻	2954 3	100 7	4866.7	11/2 ⁻	
8641.2		1641.4 16	100 6	7000.0		
		2847 3	6.9 28	5793.4		
9814.4		1173.2 8	100 7	8641.2		

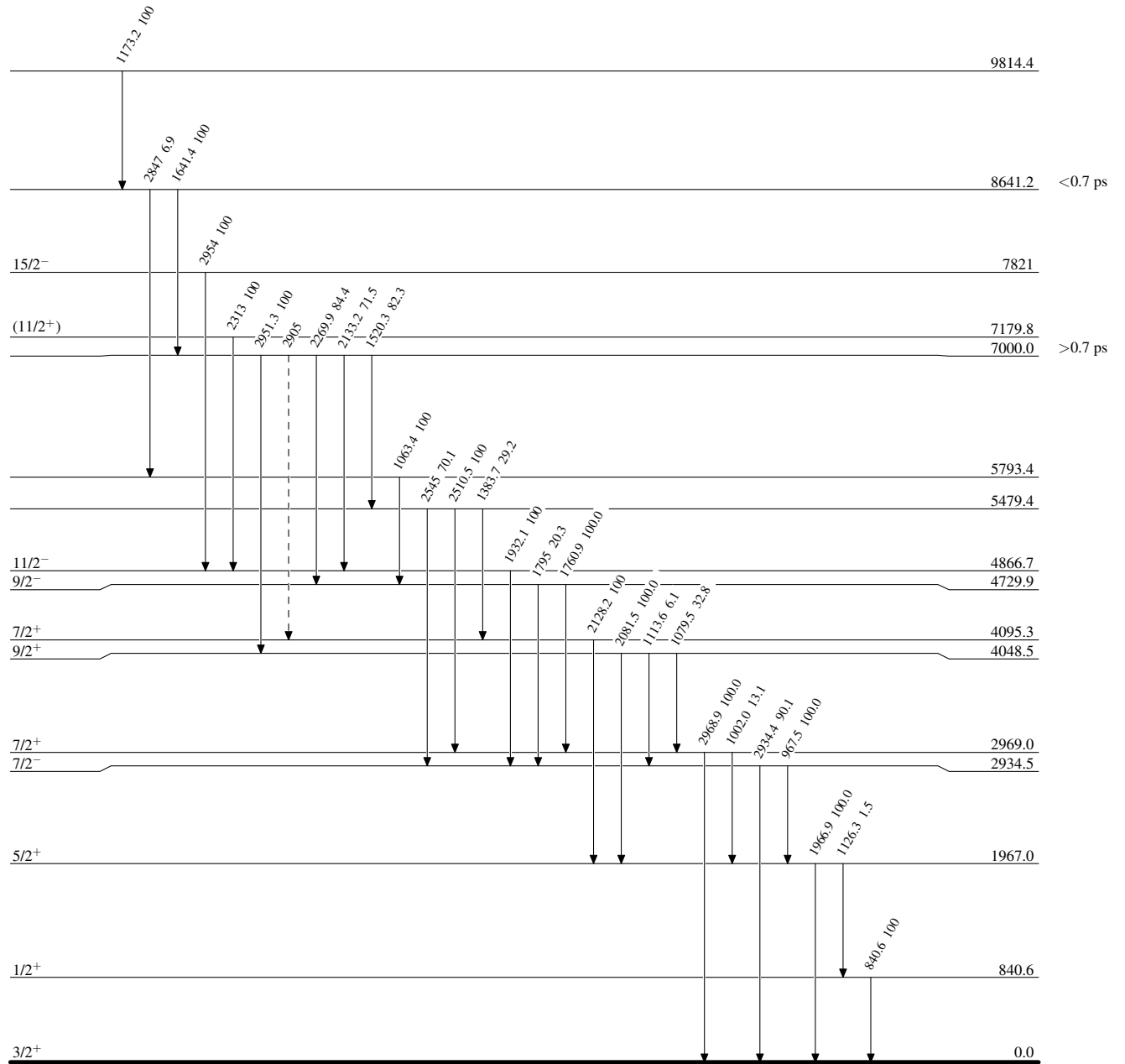
[†] From [2016Fu09](#).[‡] Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{33}_{16}\text{S}_{17}$