^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20

History

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

S(n)(^{33}S)=8641.6392 *5* (2021Wa16).

1985Ra15: thermal neutrons were produced from the Los Alamos Omega West Reactor at nominal 8-MW reactor power level. Target was high-purity ^{32}S. γ rays were detected with a 26 cm^3 coaxial Ge(Li) detector inside a 20-cm-diam by 20-cm-long NaI(Tl) annulus (FWHM=2.3 keV at 1 MeV, 5.5 keV at 6 MeV and 8.8 keV at 11 MeV). Measured σ_γ, Eγ, Iγ. Deduced levels, branching ratios.

1985Ke08: thermal neutrons were produced from the McMaster University Reactor. Target was natural ^{32}S and ^{34}S. γ rays were detected with a Ge centered in a NaI(Tl) annulus, FWHM=3.2-4.4 keV. Measured Eγ, Iγ. Deduced levels, branching ratios.

1985Gu20: thermal neutron beam was produced from a thermal reactor of the Chinese Institute of Atomic Energy (CIAE), with a flux of 2×10^6 cm^{-2}s^{-1}. Target was natural sulfur. γ rays were detected with a 140 cm^3 coaxial Ge(Li) detector, FWHM=2.5 keV at 1.33 MeV. Measured Eγ, Iγ. Deduced levels, γ-ray branching ratios. 86 γ-rays were observed, among which 34 γ-rays, mostly weak, were observed neither in 1985Ra15 nor 1985Ke08; 25 levels were deduced, among which 17 levels were confirmed in 1985Ra15 and 1985Ke08, 6 levels were confirmed in other γ-decay or reaction measurements and 2 levels (4473.1 and 2884.6) don't have matches in any measurement.

1967Ke07: thermal neutron beam of 10^7 n/s was produced from the McMaster University Reactor. Target was natural ^{32}S. γ rays were detected with a 6 cm^3 Ge(Li) detector and a 7.6-cm-diam by 7.6-cm-long NaI(Tl) scintillator. Measured Eγ, Iγ. Deduced levels, branchings, Q(β^-)values. Report 24 γ rays.

1966Va10 (also 1965Va07): thermal neutrons were produced from the Dutch High Flux Reactor (20 MW thermal power) of the Oak Ridge Material Testing Reactor type. Target was natural ^{31}P and ^{32}S. γ rays were detected with two 12.7-cm by 12.7-cm NaI(Tl) scintillation crystals. Measured Eγ, Iγ, $\gamma\gamma(\theta)$. Deduced levels, J.

Others:

1989Ko53: thermal neutrons were produced from the VVR-M reactor of the Institute of Nuclear Research, AS Ukrainian SSR. γ rays were detected with NaI(Tl) and Ge(Li) detectors. Measured Eγ, Doppler-shift attenuation. Deduced T$_{1/2}$.

1969Eg01: thermal neutron beam on natural sulfur target. Measured Eγ, Iγ with a 10 cm^3 Ge(Li) detector. Deduced levels.

1969Ko05: polarized thermal neutron beam with a flux density of 2.0×10^7 cm^{-2}s^{-1} *2* and a polarization of 75% *2* on natural targets at the DR 3 reactor (11 MV) of AEK Research Establishment Riso, Denmark. γ rays were detected with a 17 cm^3 Ge(Li) crystal, FWHM=11 keV at Eγ=7-8 MeV. Measured γ circular polarization. Deduced levels, J for 842, 3220, 4920 levels.

1967Ka03: thermal neutron beam from a 2.5 MW VVRS-type thermal reactor, with a flux of about 3x10^6 n/cm^2 per second on natural sulphur target. γ rays were detected with a 5.1-cm by 5.1-cm NaI(Tl) crystal. Measured $\gamma\gamma(\theta)$. Deduced J^π for 3220 and 5710 levels.

1965Ko10: polarized neutron beam from the 2 MW VVR(S) type reactor at the Nuclear Research Institute of the Czechoslovak Academy of Sciences in Rez. Measured Eγ, Iγ, γ-polarization. Deduced J^π for 3220 level. See also 1969Ko05 by the same first author.

1961Ve03: polarized thermal neutron beam from the Chalk River NRU reactor on different targets. γ rays were detected with a 5.08-cm-diam by 7.62-cm-thick NaI(Tl) crystal. Measured polarized γ-rays, Eγ, Iγ, σ_θ. Deduced spin of 3220 level.

1959Ma21: thermal neutron beam from the Chalk River NRX reactor, captured on different targets. γ rays were detected with two NaI(Tl) scintillation spectrometers. Measured Eγ, Iγ, $\gamma\gamma(\theta)$. Deduced spin of 3220 level.

1956Br42: thermal neutron beam from the Chalk River NRU reactor, captured on different targets. Detectors: a two-crystal Compton scintillation spectrometer. Measured Eγ, Iγ, σ_θ. Report 840γ, 1520γ, 2340γ.

1952Ki32: thermal neutron captures on phosphorus, sulfur, potassium and calcium. Measured Eγ, Iγ. Deduced levels.

2007ChZX: compilation of Eγ, Iγ from neutron capture for nuclei of Z=1-92.

2024En02: polarized neutron beam from the Japan Proton Accelerator Research Complex (J-PARC). Measured γ(circ pol). Deduced mixing ratios.

Other references: 1958Gr01, 1958Ba52, 1969Ke15, 1974Da07, 1983Ra04, 2005JeZY.

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

^{33}S Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	$3/2^+$		
840.973 *12*	$1/2^+$		J$^\pi$: from γ circular polarization of transition from 5715 keV level (1969Ko05).
1440? *10*			E(level): from 1965Va07 only.
1967.175 *27*	$5/2^+$		
2313.396 *14*	$3/2^+$		J$^\pi$: spin=3/2 from $\gamma\gamma(\theta)$ in 1966Va10.
2867.657 *20*	$5/2^+$		
2884.55?[#] *30*			
2935.08 *21*	$7/2^-$		
2968.58 *26*	$7/2^+$		
3220.699 *16*	$3/2^-$	30 fs *5*	$T_{1/2}$: from DSAM in 1989Ko53. J$^\pi$: from γ circular polarization of transition from 8646 keV level (1969Ko05,1965Ko10,1961Ve03) and $\gamma\gamma(\theta)$ (1959Ma21 and 1967Ka03).
3832.1 *9*	$5/2^+$		
3934.76 *7*	$3/2^+$		
4048.1 *4*	$9/2^+$		
4055.45 *11*	$1/2^+$		
4144.31 *6*	$5/2^+$		
4210.859 *27*	$3/2^-$	17 fs *8*	J$^\pi$: spin=3/2 from $\gamma\gamma(\theta)$ in 1966Va10. $T_{1/2}$: from DSAM in 1989Ko53.
4423.73 *5*	$1/2^+$,3/2		
4473.63 *29*			
4729.16 *24*	$9/2^-$		
4917.89 *4*	$1/2^-$		J$^\pi$: from γ circular polarization of transition from 8646 keV level (1969Ko05).
4943.62 *23*			
5208.97? *23*			
5270.29? *32*			
5286.27 *5*	(1/2,3/2,5/2$^+$)		
5348.53 *25*			
5479.80 *13*	$1/2^+$		
5612.92 *4*	($1/2^+$)		E(level): 1985Ke08 also report a level at E=5621 based on the placement of a 3020.38γ from 8642 level, but this placement is not confirmed in any other study and the same transition is placed from 5888 level to 2868 level by 1985Ra15 and 1985Gu20, which is adopted by the evaluators. Therefore, the 5621 level proposed in 1985Ke08 is omitted by the evaluators.
5710.891 *24*	$1/2^-$		J$^\pi$: spin=1/2 from $\gamma\gamma(\theta)$ in 1967Ka03 and 1966Va10.
5866.01? *13*			E(level): proposed in 1985Ke08 based on their tentative placement of a 2775.65γ from 8642 level.
5888.370 *28*	$3/2^-$		J$^\pi$: spin=3/2 from $\gamma\gamma(\theta)$ in 1966Va10.
6424.904 *28*	$(3/2)^-$		
6486.61? *15*			
6676.751 *24*	($1/2^+$,3/2)		
6708.29? *21*			
6891.2? *7*			E(level): from 1966Va10; not seen in other studies.
6958.87? *7*			
7017.21 *29*			
7187.734 *23*	$3/2^-$		J$^\pi$: spin=3/2 from $\gamma\gamma(\theta)$ (1966Va10).
7415.894 *21*	1/2,3/2		spin=1/2,3/2 from $\gamma\gamma(\theta)$ with 1/2 preferred (1966Va10).
7488.09 *11*			
7506.325 *23*			
7615.750 *30*	(1/2,3/2,5/2$^+$)		
7866.01? *7*			
8368.101 *28*			
(8641.660 *15*)	$1/2^+$		S(n)=8641.6392 *5* (2021Wa16). J$^\pi$: s-wave capture in 0^+ g.s. of ^{32}S.

Continued on next page (footnotes at end of table)

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

^{33}S Levels (continued)

† From a least-squares fit to γ-ray energies, assuming $\Delta E\gamma$=0.5 keV where not available.
‡ From the Adopted Levels. Supporting arguments from this dataset are given under comments where available.
# Level from 1985Gu20 only and considered questionable due to no observation in other (n,γ) studies and other work of different reactions and decays.

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

$\gamma(^{33}S)$

Intensity values of photons per 100 neutron captures as quoted from 1985Gu20 are converted from original Iγ cross-section values by multiplying a factor of 0.189 which is deduced by the evaluators based on the in and out absolute feedings listed in Table 3 of 1985Gu20 and the Iγ cross-section values; values quoted from 1985Ra15 are converted from original Iγ cross-section values by multiplying a factor of 0.197 as given in 1985Ra15. Original values in 1966Va10 are relative to an estimated 50% for 5420γ and have been renormalized by the evaluators to the adopted %Iγ(5420γ)=60.0 *8* as taken from 1985Ke08.

E_γ[‡]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Comments
97.90 *4*	0.0181 *20*	5710.891	1/2$^-$	5612.92	(1/2$^+$)	Additional information 24.
273.559 *24*	0.067 *8*	(8641.660)	1/2$^+$	8368.101		Additional information 52.
346.19 *14*	0.028 *5*	2313.396	3/2$^+$	1967.175	5/2$^+$	
353.034 *19*	0.278 *28*	3220.699	3/2$^-$	2867.657	5/2$^+$	Additional information 6. Eγ: other: 352.6 with a discrepant Iγ=0.017 *9* from 1985Gu20.
430.3[&]	0.021[&] *11*	5348.53		4917.89	1/2$^-$	
488.2[&]	0.017[&] *9*	7506.325		7017.21		
707.07 *16*	0.022 *4*	4917.89	1/2$^-$	4210.859	3/2$^-$	
830[d]		4055.45	1/2$^+$	3220.699	3/2$^-$	Eγ: from 1966Va10 with Iγ=1.9 *5*; they also report an 840γ with Iγ=70 *7* from 840 level. But both 1985Ra15, 1985Gu20 and 1967Ke07 only report an 841γ from 840 level, and 1985Ke08 did not see this low-energy transition. This transition is considered questionable by the evaluators.
840.974 *14*	68 *4*	840.973	1/2$^+$	0.0	3/2$^+$	Additional information 1. Eγ: others: 842 *1* (1967Ke07), 841.4 (1985Gu20), 840 (1966Va10). Iγ: from 1985Gu20. Others: 70 *7* (1966Va10) and 68 *6* (1985Ra15); 70 *5* for a doublet in 1967Ke07.
[x]856.44 *17*	0.037 *6*					
862.55 *19*	0.022 *4*	4917.89	1/2$^-$	4055.45	1/2$^+$	
907.315 *20*	0.280 *26*	3220.699	3/2$^-$	2313.396	3/2$^+$	Additional information 7.
923.48 *24*	0.023 *5*	4144.31	5/2$^+$	3220.699	3/2$^-$	
967.91 *32*	0.021 *4*	2935.08	7/2$^-$	1967.175	5/2$^+$	
970.0 *6*	0.012 *6*	5888.370	3/2$^-$	4917.89	1/2$^-$	
982.0[ad]	0.059[a] *29*	5710.891	1/2$^-$	4729.16	9/2$^-$	
983.20 *7*	0.055 *8*	4917.89	1/2$^-$	3934.76	3/2$^+$	Additional information 18.
990.4[&]	0.10[&] *5*	4210.859	3/2$^-$	3220.699	3/2$^-$	
1008.9[&]	0.0057[&] *29*	4943.62		3934.76	3/2$^+$	
1025.874 *31*	0.160 *16*	(8641.660)	1/2$^+$	7615.750	(1/2,3/2,5/2$^+$)	Additional information 53.
[x]1092.48 *15*	0.063 *10*					
1135.314 *17*	0.43 *5*	(8641.660)	1/2$^+$	7506.325		Additional information 54. Eγ: other: 1136.7 (1985Gu20). Iγ: weighted average of 0.39 *4* (1985Gu20) and 0.49 *5* (1985Ra15).
1153.40 *16*	0.039 *12*	(8641.660)	1/2$^+$	7488.09		Additional information 55.

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Comments
x1164.71 *23*	0.028 *8*					
1209.23 *27*	0.026 *4*	4144.31	5/2$^+$	2935.08	7/2$^-$	
1225.744 *15*	0.60 *7*	(8641.660)	1/2$^+$	7415.894	1/2,3/2	Additional information 56. E_γ: others: 1225 *3* (1967Ke07), 1226.2 (1985Gu20), 1230 (1966Va10). I_γ: weighted average of 0.36 *12* (1966Va10), 0.9 *3* (1967Ke07), 0.61 *7* (1985Gu20), and 0.67 *8* (1985Ra15). (1226γ)(7415γ)(θ): A_2=−0.013 *18*, A_4=+0.025 *24* (1966Va10).
1253.59 *4*	0.189 *20*	3220.699	3/2$^-$	1967.175	5/2$^+$	Additional information 8. E_γ: other: 1255.2 (1985Gu20). I_γ: other: 0.318 *35* (1985Gu20) is discrepant. Unweighted average of 1985Ra15 and 1985Gu20 gives 0.25 *7*.
1413.9&	0.066& *33*	5348.53		3934.76	3/2$^+$	
1440d *10*	0.27 *5*	1440?		0.0	3/2$^+$	E_γ,I_γ: from 1965Va07 only; not seen in other work.
1453.900 *19*	0.53 *5*	(8641.660)	1/2$^+$	7187.734	3/2$^-$	Additional information 57. E_γ: others: 1453 *3* (1967Ke07), 1454.5 (1985Gu20), 1450 (1966Va10). I_γ: weighted average of 0.36 *12* (1966Va10), 0.4 *1* (1967Ke07), 0.56 *6* (1985Gu20), and 0.56 *5* (1985Ra15). (1454γ)(7187γ)(θ): A_2=−0.175 *27*, A_4=+0.032 *37* (1966Va10).
1472.411 *13*	1.54 *14*	2313.396	3/2$^+$	840.973	1/2$^+$	Additional information 3. E_γ: others: 1470 (1966Va10), 1472.2 (1985Gu20). I_γ: weighted average of 1.47 *9* (1985Gu20) and 1.81 *18* (1985Ra15). Other: 0.84 *24* from 1966Va10 is discrepant.
1500.15 *13*	0.040 *8*	5710.891	1/2$^-$	4210.859	3/2$^-$	Additional information 25. E_γ: other: 1500.1 (1985Gu20). I_γ: weighted average of 0.047 *24* (1985Gu20) and 0.039 *8* (1985Ra15).
1624.9&	0.015& *8*	(8641.660)	1/2$^+$	7017.21		
1677.96c *10*	0.081c *12*	5612.92	(1/2$^+$)	3934.76	3/2$^+$	
1677.96c† *10*	0.081c *12*	5888.370	3/2$^-$	4210.859	3/2$^-$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1677.47. Additional information 30. E_γ: other: 1677.5γ with Iγ=0.12 *6* from 1985Gu20.
1697.21 *8*	2.43 *16*	4917.89	1/2$^-$	3220.699	3/2$^-$	Additional information 19. E_γ: unweighted average of 1697.13 *6* (1985Ke08) and 1697.296 *14* (1985Ra15). Others: 1698 *2* (1967Ke07), 1697.5 (1985Gu20), 1700 (1966Va10). I_γ: weighted average of 1.9 *5* (1966Va10), 2.69 *16* (1985Gu20), 2.18 *15* (1985Ke08), and 2.66 *26* (1985Ra15).
1744.06 *7*	0.192 *22*	5888.370	3/2$^-$	4144.31	5/2$^+$	Additional information 31. E_γ: other: 1743.8 (1985Gu20). I_γ: weighted average of 0.15 *8* (1985Gu20) and 0.195 *22* (1985Ra15).
1750d	0.12 *6*	(8641.660)	1/2$^+$	6891.2?		E_γ,I_γ: from 1966Va10 only.
1760.6&	0.064& *32*	4729.16	9/2$^-$	2968.58	7/2$^+$	

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	Comments
1844.6 ad	0.057 a 29	4729.16	9/2$^-$	2884.55?				
1897.48 4	0.43 4	4210.859	3/2$^-$	2313.396	3/2$^+$			Additional information 14. E_γ: other: 1897.5 (1985Gu20). I_γ: weighted average of 0.44 5 (1985Gu20) and 0.42 4 (1985Ra15).
1964.819 36	1.24 13	(8641.660)	1/2$^+$	6676.751	(1/2$^+$,3/2)			Additional information 58. E_γ: weighted average of 1964.76 5 (1985Ke08) and 1964.841 31 (1985Ra15). I_γ: weighted average of 1.14 11 (1985Ke08) and 1.40 14 (1985Ra15).
1967.17 6	0.74 8	1967.175	5/2$^+$	0.0	3/2$^+$			Additional information 2. E_γ: weighted average of 1968 3 (1967Ke07), 1967.20 6 (1985Ke08), and 1967.13 6 (1985Ra15). Other: 1965.5 (1985Gu20), 1970 (1966Va10). I_γ: weighted average of 0.69 8 (1985Ke08) and 0.81 10 (1985Ra15). Others: 0.36 12 (1966Va10) and 1.99 12 (1985Gu20) are discrepant.
2110.3 4	0.024 8	4423.73	1/2$^+$,3/2	2313.396	3/2$^+$			
2179.2 &†	0.023 & 11	4144.31	5/2$^+$	1967.175	5/2$^+$			E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=2177.06.
2214.00 8	0.47 6	6424.904	(3/2)$^-$	4210.859	3/2$^-$			Additional information 36.
2216.714 30	1.99 13	(8641.660)	1/2$^+$	6424.904	(3/2)$^-$			Additional information 59. E_γ: weighted average of 2218 2 (1967Ke07), 2216.60 5 (1985Ke08), and 2216.729 18 (1985Ra15). Other: 2216.3 (1985Gu20), 2210 (1966Va10). I_γ: weighted average of 2.4 6 (1966Va10), 1.7 3 (1967Ke07), 2.1 4 (1985Gu20), 1.9 1 (1985Ke08), and 2.62 24 (1985Ra15).
2243.5 ad	0.37 a 4	7187.734	3/2$^-$	4943.62				
2280.54 15	0.112 20	6424.904	(3/2)$^-$	4144.31	5/2$^+$			Additional information 37. E_γ: other: 2280.3 with Iγ=0.030 15 (1985Gu20).
2313.34 7	0.68 7	2313.396	3/2$^+$	0.0	3/2$^+$			Additional information 4. E_γ: unweighted average of 2313.27 5 (1985Ke08) and 2313.401 23 (1985Ra15). I_γ: weighted average of 0.58 7 (1985Gu20), 0.73 9 (1985Ke08), and 0.77 8 (1985Ra15). Other: 0.7 4 (1966Va10).
2379.59 7	42.8 7	3220.699	3/2$^-$	840.973	1/2$^+$	(E1(+M2))	0.43 +31−43	Additional information 9. E_γ: unweighted average of 2379.52 3 (1985Ke08) and 2379.657 11 (1985Ra15). Others: 2379 2 (1967Ke07), 2379.3 (1985Gu20), 2380 (1966Va10).

$^{33}_{16}S_{17}$-6

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Comments
						I_γ: weighted average of 40 *4* (1966Va10), 43.9 *33* (1967Ke07), 41.3 *24* (1985Gu20), 42.9 *7* (1985Ke08), and 45 *4* (1985Ra15). Mult.,δ: from γ(circ pol) in 2024En02. But RUL=3 for B(M2)(W.u.) requires δ(M2/E1)<0.05.
2456.12 *24*	0.063 *10*	4423.73	1/2$^+$,3/2	1967.175	5/2$^+$	Additional information 16.
2465.84 *14*	0.075 *14*	6676.751	(1/2$^+$,3/2)	4210.859	3/2$^-$	Additional information 40.
2490.15 *7*	2.50 *14*	5710.891	1/2$^-$	3220.699	3/2$^-$	Additional information 26. E_γ: unweighted average of 2490.08 *3* (1985Ke08) and 2490.221 *14* (1985Ra15). Others: 2493 *2* (1967Ke07), 2490.4 (1985Gu20), 2490 (1966Va10). I_γ: weighted average of 2.6 *6* (1966Va10), 2.44 *14* (1985Gu20), 2.52 *16* (1985Ke08), and 2.66 *26* (1985Ra15). Other: 3.9 *4* (1967Ke07) is discrepant. 2490γ-2379$\gamma(\theta)$: A_2=+0.38 *10* (1966Va10).
2507.4&	0.251& *28*	4473.63		1967.175	5/2$^+$	
2532.07 *28*	0.051 *8*	6676.751	(1/2$^+$,3/2)	4144.31	5/2$^+$	
2667.59 *4*	0.74 *9*	5888.370	3/2$^-$	3220.699	3/2$^-$	Additional information 32. E_γ: weighted average of 2667.58 *4* (1985Ke08) and 2667.72 *15* (1985Ra15). Others: 2667.8 (1985Gu20), 2670 (1966Va10). I_γ: weighted average of 0.7 *4* (1966Va10), 0.73 *9* (1985Ke08), and 0.75 *10* (1985Ra15). Other: 1.33 *8* (1985Gu20) is discrepant.
2753.11 *8*	5.58 *20*	(8641.660)	1/2$^+$	5888.370	3/2$^-$	Additional information 60. E_γ: unweighted average of 2753 *2* (1967Ke07), 2753.07 *3* (1985Ke08), and 2753.26 *6* (1985Ra15). Others: 2752.9 (1985Gu20), 2750 (1966Va10). I_γ: weighted average of 5.8 *9* (1966Va10), 4.5 *5* (1967Ke07), 5.67 *33* (1985Gu20), 5.7 *2* (1985Ke08), and 5.7 *6* (1985Ra15). (2753γ)(5047$\gamma(\theta)$: A_2=+0.20 *5* (1966Va10). (2753γ)(5888$\gamma(\theta)$: A_2=−0.25 *5* (1966Va10).
2775.53#@d *13*	0.10# *1*	(8641.660)	1/2$^+$	5866.01?		
2867.47 *4*	0.76 *9*	2867.657	5/2$^+$	0.0	3/2$^+$	Additional information 5. E_γ: weighted average of 2867.45 *4* (1985Ke08) and 2867.54 *8* (1985Ra15). Other: 2868.1 (1985Gu20). I_γ: weighted average of 0.64 *7* (1985Gu20), 0.82 *9* (1985Ke08), and 0.95 *10* (1985Ra15).
2884.5ad	0.028a *14*	2884.55?		0.0	3/2$^+$	
2930.59 *4*	16.9 *4*	(8641.660)	1/2$^+$	5710.891	1/2$^-$	Additional information 61. E_γ: weighted average of 2931 *2* (1967Ke07), 2930.57 *3* (1985Ke08), and 2930.71 *7* (1985Ra15). Others: 2930.3 (1985Gu20), 2930 (1966Va10). I_γ: weighted average of 17.4 *18* (1966Va10), 16.0 *11* (1967Ke07), 17.0 *10* (1985Gu20), 17.0 *4* (1985Ke08), and 17.1 *18* (1985Ra15). (2931γ)(4869$\gamma(\theta)$: A_2=+0.007 *18* (1966Va10). (2931γ)(2490$\gamma(\theta)$: A_2=−0.05 *18* (1966Va10).
2968.5&	0.208& *23*	2968.58	7/2$^+$	0.0	3/2$^+$	

$^{33}_{16}S_{17}$-7

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	Comments
2972.66 *11*	0.119 *20*	5286.27	(1/2,3/2,5/2$^+$)	2313.396	3/2$^+$			Additional information 21. E_γ: from 1985Ke08. Other: 2973.0 *9* (1985Ra15). I_γ: weighted average of 0.11 *2* (1985Ke08) and 0.138 *30* (1985Ra15).
3020.38 *6*	0.20 *3*	5888.370	3/2$^-$	2867.657	5/2$^+$			Additional information 33. 1985Ke08 place a 3020.38γ from 8642 level making a level at 5621, but this placement is not confirmed in any other study and the same transition is placed from 5888 level to 2868 level by 1985Ra15 and 1985Gu20, which is adopted by the evaluators. E_γ: weighted average of 3020.35 *31* (1985Ra15) and 3020.38 *6* (1985Ke08). Other: 3020.4 (1985Gu20). I_γ: weighted average of 0.21 *5* (1985Ra15) and 0.19 *3* (1985Ke08). Other: 0.057 *29* (1985Gu20) is discrepant.
3029.1 *5*	0.18 *4*	(8641.660)	1/2$^+$	5612.92	(1/2$^+$)			Additional information 62.
3161.71 *13*	0.113 *33*	(8641.660)	1/2$^+$	5479.80	1/2$^+$			Additional information 63. E_γ: from 1985Ke08. Other: 3161.60 *34* (1985Ra15). I_γ: unweighted average of 0.08 *1* (1985Ke08) and 0.146 *30* (1985Ra15).
3220.49 *4*	24.7	3220.699	3/2$^-$	0.0	3/2$^+$	(E1(+M2))	0.19 *+18−15*	Additional information 10. E_γ: weighted average of 3221 *2* (1967Ke07), 3220.46 *3* (1985Ke08), and 3220.59 *5* (1985Ra15). Other: 3220.6 (1985Gu20), 3220 (1966Va10). I_γ: weighted average of 26.9 *24* (1966Va10), 23.5 *16* (1967Ke07), 24.5 *14* (1985Gu20), 24.8 *5* (1985Ke08), and 24.4 *24* (1985Ra15). Mult.,δ: from γ(circ pol) in 2024En02. But RUL=3 for B(M2)(W.u.) requires δ(M2/E1)<0.13.
3252.3 ad	0.021 a *11*	7187.734	3/2$^-$	3934.76	3/2$^+$			
3292.8 ad	0.217 a *24*	(8641.660)	1/2$^+$	5348.53				
3303.3 &	0.064 & *32*	4144.31	5/2$^+$	840.973	1/2$^+$			
3355.19 *6*	0.21 *5*	(8641.660)	1/2$^+$	5286.27	(1/2,3/2,5/2$^+$)			Additional information 64. E_γ: weighted average of 3355.18 *6* (1985Ke08) and 3355.35 *34* (1985Ra15). I_γ: weighted average of 0.25 *4* (1985Ke08) and 0.16 *4* (1985Ra15).
3369.68 *4*	5.27 *20*	4210.859	3/2$^-$	840.973	1/2$^+$			Additional information 15.

$^{33}_{16}S_{17}$-8

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

γ(^{33}S) (continued)

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Comments
						E_γ: weighted average of 3370 *2* (1967Ke07), 3369.65 *3* (1985Ke08), and 3369.78 *6* (1985Ra15). I_γ: weighted average of 4.7 *6* (1966Va10), 5.5 *6* (1967Ke07), 4.87 *28* (1985Gu20), 5.5 *2* (1985Ke08), and 5.3 *5* (1985Ra15).
3397.40 *11*	1.31 *14*	5710.891	1/2$^-$	2313.396	3/2$^+$	Additional information 27. E_γ: unweighted average of 3397.29 *3* (1985Ke08) and 3397.51 *8* (1985Ra15). Others: 3397.5 (1985Gu20), 3400 (1966Va10). I_γ: unweighted average of 1.6 *4* (1966Va10), 1.48 *9* (1985Gu20), 1.06 *10* (1985Ke08), and 1.10 *12* (1985Ra15).
3455.84 *6*	0.19 *3*	6676.751	(1/2$^+$,3/2)	3220.699	3/2$^-$	Additional information 41. E_γ: from 1985Ke08. Other: 3455.75 *25* (1985Ra15). I_γ: from 1985Ke08 and 1985Ra15.
3456.5[ad]	0.08[a] *4*	6424.904	(3/2)$^-$	2968.58	7/2$^+$	
3582.52 *13*	0.07 *1*	4423.73	1/2$^+$,3/2	840.973	1/2$^+$	Additional information 17. E_γ: weighted average of 3582.48 *13* (1985Ke08) and 3582.74 *29* (1985Ra15). I_γ: from 1985Ke08. Other: 0.071 *18* (1985Ra15).
3697.9[ad]	0.036[a] *18*	(8641.660)	1/2$^+$	4943.62		
3723.61 *7*	2.81 *16*	(8641.660)	1/2$^+$	4917.89	1/2$^-$	Additional information 65. E_γ: unweighted average of 3723.54 *3* (1985Ke08) and 3723.68 *4* (1985Ra15). Others: 3726 *2* (1967Ke07), 3723.2 (1985Gu20), 3720 (1966Va10). I_γ: weighted average of 1.9 *5* (1966Va10), 3.4 *3* (1967Ke07), 2.90 *17* (1985Gu20), 2.72 *16* (1985Ke08), and 2.66 *26* (1985Ra15). (3724γ)(1697γ)(θ): A_2=+0.011 *34* (1966Va10).
3809.49† *14*	0.062 *9*	6676.751	(1/2$^+$,3/2)	2867.657	5/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=3808.858. Additional information 42. E_γ: weighted average of 3809.51 *14* (1985Ke08) and 3809.2 *5* (1985Ra15). I_γ: weighted average of 0.061 *9* (1985Ke08) and 0.065 *16* (1985Ra15).
3831.9 *9*	0.034 *10*	3832.1	5/2$^+$	0.0	3/2$^+$	
3912.2[ad]	0.09[a] *4*	(8641.660)	1/2$^+$	4729.16	9/2$^-$	
3920.85 *7*	0.133 *18*	5888.370	3/2$^-$	1967.175	5/2$^+$	E_γ: weighted average of 3920.84 *7* (1985Ke08) and 3920.99 *22* (1985Ra15). I_γ: weighted average of 0.13 *2* (1985Ke08) and 0.136 *18* (1985Ra15).
3934.7 *12*	0.057 *14*	3934.76	3/2$^+$	0.0	3/2$^+$	Additional information 11. E_γ,I_γ: other: 3934.4 with Iγ=0.09 *5* (1985Gu20).
3966.1[ad]	0.019[a] *10*	7187.734	3/2$^-$	3220.699	3/2$^-$	
4047.9[&]	0.11[&] *6*	4048.1	9/2$^+$	0.0	3/2$^+$	
4055.21 *15*	0.051 *7*	4055.45	1/2$^+$	0.0	3/2$^+$	Additional information 12. E_γ: from 1985Ke08. Other: 4055.2 *5* (1985Ra15), 4055.2 (1985Gu20). I_γ: weighted average of 0.09 *5* (1985Gu20), 0.049 *7* (1985Ke08), and 0.057 *16* (1985Ra15).
4076.2 *7*	0.071 *20*	4917.89	1/2$^-$	840.973	1/2$^+$	Additional information 20.

$^{33}_{16}S_{17}$-9

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡b	E_i(level)	J_i^π	E_f	J_f^π	Comments
						E_γ: other: 4076.6 (1985Gu20). I_γ: weighted average of 0.08 *4* (1985Gu20) and 0.069 *20* (1985Ra15).
4101.9&	0.045& *23*	4943.62		840.973	$1/2^+$	
4144.19 *17*	0.26 *5*	4144.31	$5/2^+$	0.0	$3/2^+$	Additional information 13. E_γ: unweighted average of 4144.02 *5* (1985Ke08) and 4144.36 *14* (1985Ra15). I_γ: weighted average of 0.12 *6* (1985Gu20), 0.30 *4* (1985Ke08), and 0.28 *4* (1985Ra15).
4168.3ad	0.068a *34*	(8641.660)	$1/2^+$	4473.63		
4210.9&	0.08& *4*	4210.859	$3/2^-$	0.0	$3/2^+$	
4217.62 *5*	0.223 *30*	(8641.660)	$1/2^+$	4423.73	$1/2^+$,3/2	Additional information 66. E_γ: from 1985Ke08. Other: 4217.53 *21* (1985Ra15). I_γ: weighted average of 0.22 *3* (1985Ke08) and 0.225 *30* (1985Ra15).
4283.9&	0.019& *10*	7506.325		3220.699	$3/2^-$	
4362.98 *6*	0.31 *4*	6676.751	$(1/2^+,3/2)$	2313.396	$3/2^+$	Additional information 43. E_γ: weighted average of 4362.96 *5* (1985Ke08) and 4363.14 *13* (1985Ra15). I_γ: other: 0.31 *5* (1985Ke08).
4430.61 *15*	5.0 *2*	(8641.660)	$1/2^+$	4210.859	$3/2^-$	Additional information 67. E_γ: unweighted average of 4430.46 *3* (1985Ke08) and 4430.75 *5* (1985Ra15). Others: 4432 *2* (1967Ke07), 4430.2 (1985Gu20), 4430 (1966Va10). I_γ: from 1985Ke08. Others: 4.7 *6* (1966Va10), 5.0 *4* (1967Ke07), 5.09 *30* (1985Gu20), and 5.0 *5* (1985Ra15). (4430γ)(3370γ)(θ): A_2=+0.274 *28* (1966Va10).
4445.02 *13*	0.13 *2*	5286.27	$(1/2,3/2,5/2^+)$	840.973	$1/2^+$	Additional information 22. E_γ: weighted average of 4445.04 *7* (1985Ke08) and 4444.1 *5* (1985Ra15). I_γ: from 1985Ke08. Other: 0.16 *6* (1985Ra15).
4446.6ad	0.042a *21*	7415.894	1/2,3/2	2968.58	$7/2^+$	
4457.72# *21*	0.035# *5*	6424.904	$(3/2)^-$	1967.175	$5/2^+$	
4472.8&	0.07& *4*	4473.63		0.0	$3/2^+$	
4496.5ad	0.019a *10*	(8641.660)	$1/2^+$	4144.31	$5/2^+$	
4585.72# *27*	0.027# *4*	(8641.660)	$1/2^+$	4055.45	$1/2^+$	E_γ: others: 4585.9 (1985Gu20), 4590 (1966Va10). I_γ: others: 0.10 *5* (1985Gu20) and 1.9 *5* (1966Va10) are discrepant.
4593.3ad	0.059a *29*	(8641.660)	$1/2^+$	4048.1	$9/2^+$	
4708.66† *9*	0.095 *14*	6676.751	$(1/2^+,3/2)$	1967.175	$5/2^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=4709.216. Additional information 44. E_γ: from 1985Ke08. Other: 4708.7 *5* (1985Ra15). I_γ: weighted average of 0.093 *14* (1985Ke08) and 0.101 *22* (1985Ra15).
4728.9&d	0.019& *10*	4729.16	$9/2^-$	0.0	$3/2^+$	This γ is considered questionable by the evaluators since Mult=[E3] from level scheme would require a large B(E3)(W.u.) exceeding RUL.

$^{33}_{16}S_{17}$-10

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ[‡]	I_γ[‡ b]	E_i(level)	J_i^π	E_f	J_f^π	Comments
4749.09[#†] *22*	0.033[#] *5*	7615.750	(1/2,3/2,5/2$^+$)	2867.657	5/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=4747.726.
4771.14[†] *7*	0.127 *20*	5612.92	(1/2$^+$)	840.973	1/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=4771.57. Additional information 23. E_γ: from 1985Ke08. Other: 4771.1 *4* (1985Ra15). I_γ: weighted average of 0.12 *2* (1985Ke08) and 0.144 *32* (1985Ra15).
4869.49 *8*	12.6 *4*	5710.891	1/2$^-$	840.973	1/2$^+$	Additional information 28. E_γ: unweighted average of 4869.41 *3* (1985Ke08), and 4869.56 *4* (1985Ra15). Others: 4874 *2* (1967Ke07), 4869.5 (1985Gu20), 4870 (1966Va10). I_γ: weighted average of 13.2 *12* (1966Va10), 12.8 *10* (1967Ke07), 11.7 *7* (1985Gu20), 12.7 *4* (1985Ke08), and 12.8 *12* (1985Ra15).
4917.39 *7*	0.116 *20*	4917.89	1/2$^-$	0.0	3/2$^+$	E_γ: from 1985Ke08. Other: 4917.7 *6* (1985Ra15). I_γ: weighted average of 0.12 *2* (1985Ke08) and 0.110 *26* (1985Ra15).
4943.2[&]	0.39[&] *4*	4943.62		0.0	3/2$^+$	
5047.04 *11*	2.98 *18*	5888.370	3/2$^-$	840.973	1/2$^+$	Additional information 34. E_γ: unweighted average of 5046.93 *3* (1985Ke08) and 5047.14 *4* (1985Ra15). Others: 5051 *2* (1967Ke07), 3046.9 (1985Gu20), 5050 (1966Va10). I_γ: weighted average of 4.1 *6* (1966Va10), 3.5 *5* (1967Ke07), 2.65 *16* (1985Gu20), 3.2 *2* (1985Ke08), and 3.19 *30* (1985Ra15).
5208.53[#@d] *23*	0.036[#] *4*	5208.97?		0.0	3/2$^+$	
5221.2[ad]	0.057[a] *29*	7187.734	3/2$^-$	1967.175	5/2$^+$	
5269.84[#@d] *32*	0.026[#] *3*	5270.29?		0.0	3/2$^+$	
5301.71[#] *46*	0.018[#] *3*	7615.750	(1/2,3/2,5/2$^+$)	2313.396	3/2$^+$	
5348.1[&]	0.064[&] *32*	5348.53		0.0	3/2$^+$	
5420.52 *3*	60.0 *8*	(8641.660)	1/2$^+$	3220.699	3/2$^-$	Additional information 68. E_γ: unweighted average of 5420.48 *3* (1985Ke08) and 5420.58 *4* (1985Ra15). Other: 5425 *2* (1967Ke07), 5420.4 (1985Gu20), 5420 (1966Va10). I_γ: from 1985Ke08. Others: 57.0 *33* (1985Gu20), 60 *5* (1985Ra15), 61.0 (1967Ke07); original value in 1966Va10 is estimated as 50 and has been renormalized to the adopted 60.0 by the evaluators.
5449.4[ad]	0.15[a] *8*	7415.894	1/2,3/2	1967.175	5/2$^+$	
5478.5 *12*	0.030 *3*	5479.80	1/2$^+$	0.0	3/2$^+$	E_γ: unweighted average of 5479.7 *8* (1985Ra15) and 5477.33 *11* (1985Ke08). 5477.33γ is tentatively placed in 1985Ke08. I_γ: weighted average of 0.031 *3* (1985Ke08) and 0.022 *8* (1985Ra15). 1985Ra15 also report a much larger intensity of 0.063 *14* for an unobserved 4638.8γ from the same level, inferred from intensity balance requirement and known branching from other work. It is surprising that this much stronger γ with a lower energy was not observed in 1985Ra15 and 1985Ke08 while the weaker 5479γ was observed.

$^{33}_{16}S_{17}$-11

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Comments
5583.54 *15*	1.39 *10*	6424.904	$(3/2)^-$	840.973	$1/2^+$	Additional information 38. E_γ: unweighted average of 5583.39 *3* (1985Ke08) and 5583.68 *8* (1985Ra15). Others: 5586 *2* (1967Ke07), 5583.4 (1985Gu20), 5590 (1966Va10). I_γ: weighted average of 1.7 *3* (1967Ke07), 1.24 *7* (1985Gu20), 1.6 *1* (1985Ke08), 1.48 *16* (1985Ra15), and 2.4 *6* (1966Va10).
5611.88 *27*	0.025 *4*	5612.92	$(1/2^+)$	0.0	$3/2^+$	E_γ,I_γ: from 1985Ke08 only.
5648.07 *7*	0.055 *8*	7615.750	$(1/2,3/2,5/2^+)$	1967.175	$5/2^+$	Additional information 51. E_γ: from 1985Ke08. Other: 5648.4 *6* (1985Ra15). I_γ: weighted average of 0.054 *8* (1985Ke08) and 0.059 *16* (1985Ra15).
5710.36 *4*	0.179 *26*	5710.891	$1/2^-$	0.0	$3/2^+$	Additional information 29. E_γ: from 1985Ke08. Others: 5710.40 *25* (1985Ra15), 5710.8 (1985Gu20). I_γ: from 1985Ra15. Others: 0.12 *6* (1985Gu20) and 0.20 *3* (1985Ke08).
5756.6 ad	0.055 a *28*	(8641.660)	$1/2^+$	2884.55?		
5773.53 *6*	0.080 *10*	(8641.660)	$1/2^+$	2867.657	$5/2^+$	Additional information 69. E_γ: from 1985Ke08. Other: 5773.8 *5* (1985Ra15), 5773.0 (1985Gu20). I_γ: weighted average of 0.049 *25* (1985Gu20), 0.09 *1* (1985Ke08), and 0.071 *14* (1985Ra15).
5835.40 *22*	0.155 *20*	6676.751	$(1/2^+,3/2)$	840.973	$1/2^+$	Additional information 45. E_γ: unweighted average of 5835.18 *5* (1985Ke08) and 5835.61 *20* (1985Ra15). I_γ: weighted average of 0.15 *2* (1985Ke08) and 0.162 *22* (1985Ra15).
5887.98 *11*	0.76 *8*	5888.370	$3/2^-$	0.0	$3/2^+$	Additional information 35. E_γ: unweighted average of 5887.87 *3* (1985Ke08) and 5888.09 *8* (1985Ra15). Others: 5894 *2* (1967Ke07), 5888.1 (1985Gu20), 5890 (1966Va10). I_γ: weighted average of 0.96 *24* (1966Va10), 1.0 *2* (1967Ke07), 0.69 *8* (1985Gu20), 0.80 *9* (1985Ke08), and 0.75 *8* (1985Ra15).
6327.74 *5*	0.124 *16*	(8641.660)	$1/2^+$	2313.396	$3/2^+$	Additional information 70. E_γ: from 1985Ke08. Other: 6327.79 *23* (1985Ra15). I_γ: weighted average of 0.12 *2* (1985Ke08) and 0.126 *16* (1985Ra15).
6346.12 *20*	0.017 *3*	7187.734	$3/2^-$	840.973	$1/2^+$	E_γ: from 1985Ke08. Other: 6345.8 *9* (1985Ra15). Not seen in 1985Gu20. I_γ: from 1985Ke08. Other: 0.017 *5* (1985Ra15).
6424.34 *7*	0.120 *18*	6424.904	$(3/2)^-$	0.0	$3/2^+$	Additional information 39. E_γ: weighted average of 6424.33 *5* (1985Ke08) and 6424.72 *28* (1985Ra15). Other: 6424.6 (1985Gu20). I_γ: weighted average of 0.13 *6* (1985Gu20), 0.13 *2* (1985Ke08), and 0.110 *18* (1985Ra15).
6485.93 #@d *15*	0.023 # *2*	6486.61?		0.0	$3/2^+$	
6574.56 *37*	0.118 *18*	7415.894	1/2,3/2	840.973	$1/2^+$	E_γ: unweighted average of 6574.19 *5* (1985Ke08) and 6574.93 *22* (1985Ra15). I_γ: other: 0.12 *2* (1985Ke08).
6664.60 *22*	0.214 *26*	7506.325		840.973	$1/2^+$	Additional information 49. E_γ: unweighted average of 6664.38 *4* (1985Ke08) and 6664.82 *15* (1985Ra15). Other: 6662.9 (1985Gu20).

$^{33}_{16}S_{17}$-12

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Comments
						I_γ: weighted average of 0.12 *6* (1985Gu20), 0.22 *3* (1985Ke08), and 0.227 *26* (1985Ra15).
6673.62 *8*	0.47 *6*	(8641.660)	$1/2^+$	1967.175	$5/2^+$	E_γ: from 1985Ke08. Others: 6678 *2* (1967Ke07), 6675.4 (1985Gu20). I_γ: weighted average of 0.36 *12* (1966Va10), 0.6 *2* (1967Ke07), and 0.49 *6* (1985Gu20). Other: 0.048 *7* from 1985Ke08 is discrepant and seems too small. (6674γ)(1967γ)(θ): A_2=−0.21 *8*, A_4=−0.13 *11* (1966Va10).
6676.04 *4*	0.27 *4*	6676.751	$(1/2^+,3/2)$	0.0	$3/2^+$	Additional information 46. E_γ: weighted average of 6676.03 *4* (1985Ke08) and 6676.13 *13* (1985Ra15). I_γ: weighted average of 0.23 *3* (1985Ke08) and 0.311 *32* (1985Ra15).
6707.56#@d *21*	0.016# *2*	6708.29?		0.0	$3/2^+$	
6890d	0.12 *6*	6891.2?		0.0	$3/2^+$	E_γ,I_γ: from 1966Va10 only.
6958.08#@d *7*	0.056# *7*	6958.87?		0.0	$3/2^+$	E_γ: other: 6958.3 *5* unplaced in 1985Ra15. I_γ: weighted average of 0.060 *6* (1985Ke08) and 0.045 *10* (1985Ra15).
7016.0&	0.036& *18*	7017.21		0.0	$3/2^+$	
7186.98 *6*	0.327 *34*	7187.734	$3/2^-$	0.0	$3/2^+$	Additional information 47. E_γ: weighted average of 7186.96 *4* (1985Ke08) and 7187.19 *15* (1985Ra15). Other: 7193 *2* (1967Ke07), 7186.4 (1985Gu20). I_γ: weighted average of 0.36 *12* (1966Va10), 0.5 *1* (1967Ke07), 0.33 *5* (1985Ke08), and 0.303 *34* (1985Ra15). Other: 0.11 *6* from 1985Gu20.
7415.13 *19*	0.41 *4*	7415.894	1/2,3/2	0.0	$3/2^+$	Additional information 48. E_γ: unweighted average of 7414.94 *4* (1985Ke08) and 7415.31 *15* (1985Ra15). Others: 7421 *2* (1967Ke07), 7414.6 (1985Gu20), 7410 (1966Va10). I_γ: weighted average of 0.36 *12* (1966Va10), 0.37 *4* (1985Gu20), 0.47 *7* (1985Ke08), and 0.44 *5* (1985Ra15). Other: 0.8 *2* (1967Ke07).
7487.05 *15*	0.027 *4*	7488.09		0.0	$3/2^+$	E_γ: weighted average of 7487.03 *15* (1985Ke08) and 7487.6 *9* (1985Ra15). The placement by 1985Ke08 is tentative. I_γ: weighted average of 0.026 *3* (1985Ke08) and 0.036 *8* (1985Ra15).
7505.90† *11*	0.139 *20*	7506.325		0.0	$3/2^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=7505.409. Additional information 50. E_γ: weighted average of 7504.88 *6* (1985Ke08) and 7505.6 *4* (1985Ra15). I_γ: weighted average of 0.13 *7* (1985Gu20), 0.12 *2* (1985Ke08), and 0.162 *22* (1985Ra15).
7528.2 *9*	0.020 *6*	8368.101		840.973	$1/2^+$	
7614.62 *8*	0.057 *9*	7615.750	$(1/2,3/2,5/2^+)$	0.0	$3/2^+$	E_γ: weighted average of 7614.61 *8* (1985Ke08) and 7614.9 *6* (1985Ra15). I_γ: weighted average of 0.062 *9* (1985Ke08) and 0.051 *10* (1985Ra15).
7799.59 *5*	2.91 *17*	(8641.660)	$1/2^+$	840.973	$1/2^+$	Additional information 71. E_γ: weighted average of 7799.58 *3* (1985Ke08) and 7799.77 *12* (1985Ra15). Other: 7804 *2* (1967Ke07).

$^{33}_{16}S_{17}$-13

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20 (continued)

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

E_γ ‡	I_γ ‡b	E_i(level)	J_i^π	E_f	J_f^π	Comments
						I_γ: weighted average of 3.6 *7* (1966Va10), 4.1 *6* (1967Ke07), 2.87 *17* (1985Gu20), 2.89 *17* (1985Ke08), and 2.70 *28* (1985Ra15). (7800γ)(841γ)(θ): A_2=+0.005 *7*, A_4=+0.012 *9* (1966Va10).
7865.00#@d *7*	0.074# *7*	7866.01?		0.0	3/2$^+$	
8366.8 *6*	0.030 *6*	8368.101		0.0	3/2$^+$	
8640.40 *3*	1.88 *11*	(8641.660)	1/2$^+$	0.0	3/2$^+$	Additional information 72. E_γ: weighted average of 8640.40 *3* (1985Ke08) and 8640.45 *12* (1985Ra15). Other: 8646 *1* (1967Ke07). I_γ: weighted average of 2.5 *5* (1967Ke07), 1.79 *11* (1985Gu20), 2.02 *14* (1985Ke08), and 1.81 *18* (1985Ra15). Other: 2.4 *6* (1966Va10).

† Poor fit; uncertainty multiplied by a factor in the fitting.
‡ From 1985Ra15, unless otherwise noted. Values have been compared with those in the PGAA-LBL database (2007ChZX). 1985Gu20 report many new transitions which are not seen in other (n,γ) studies and have no detailed information and some of them are considered questionable by the evaluators as noted.
# From 1985Ke08.
@ Tentative placement by 1985Ke08.
& From 1985Gu20 only.
a Transition reported in 1985Gu20 but considered questionable by the evaluators as it is not seen in other (n,γ) studies or other work using different reactions, while a relatively weaker transition from the same decaying level is seen in other studies.
b Intensity per 100 neutron captures.
c Multiply placed with undivided intensity.
d Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

$^{33}_{16}S_{17}$-14

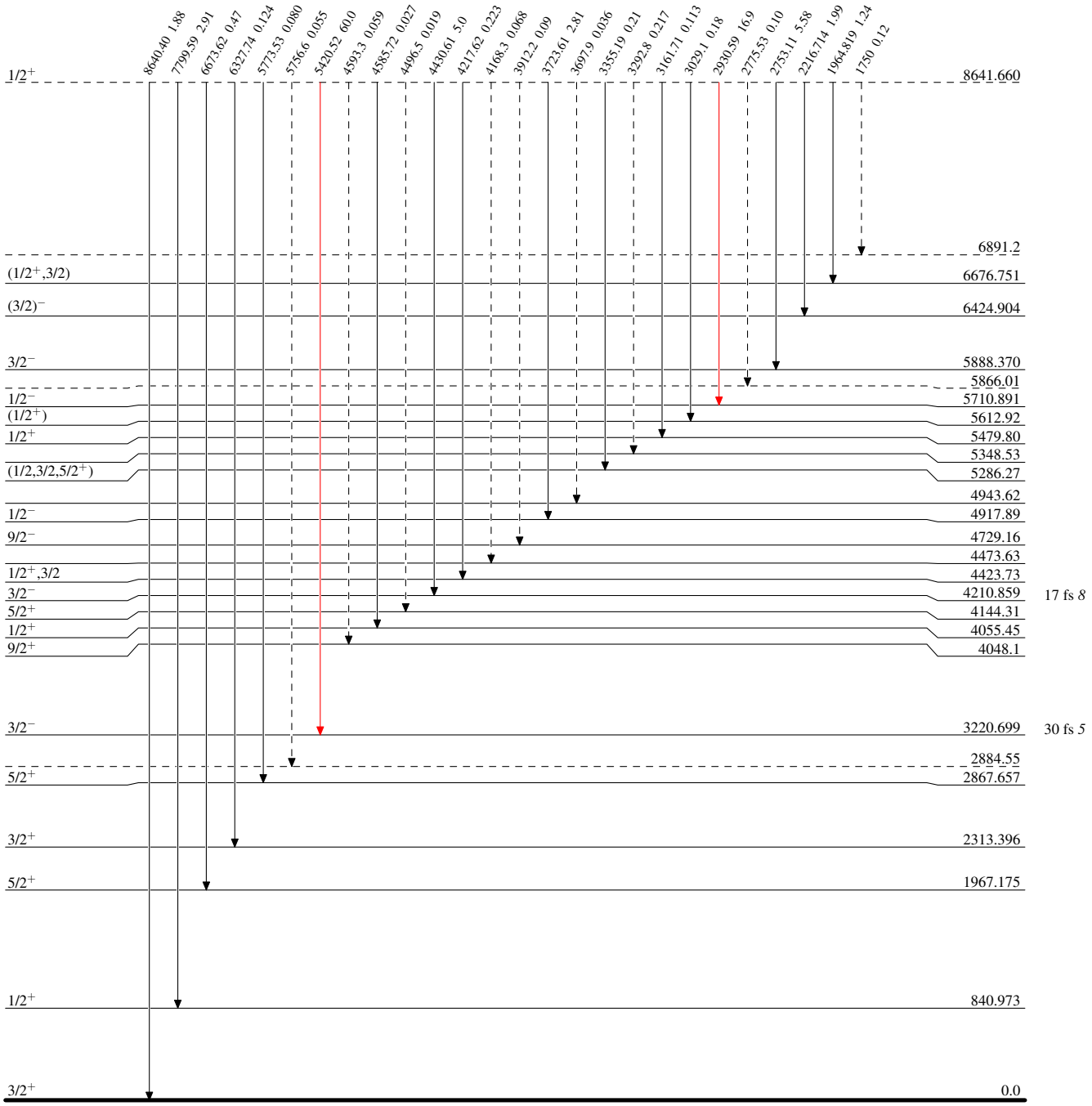
^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20

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)

Level Scheme

Intensities: I_γ per 100 neutron captures



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

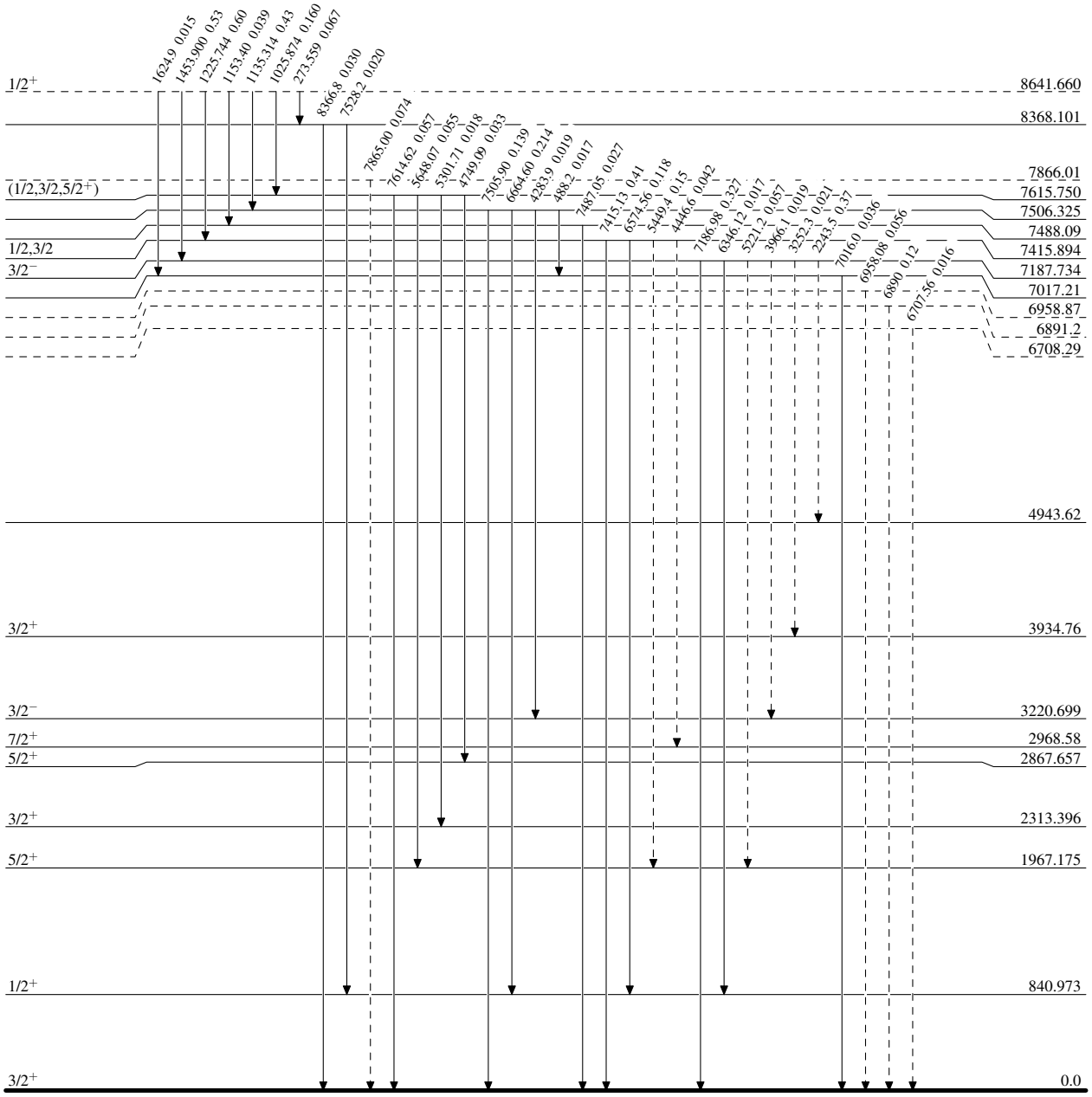
^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20

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)

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures



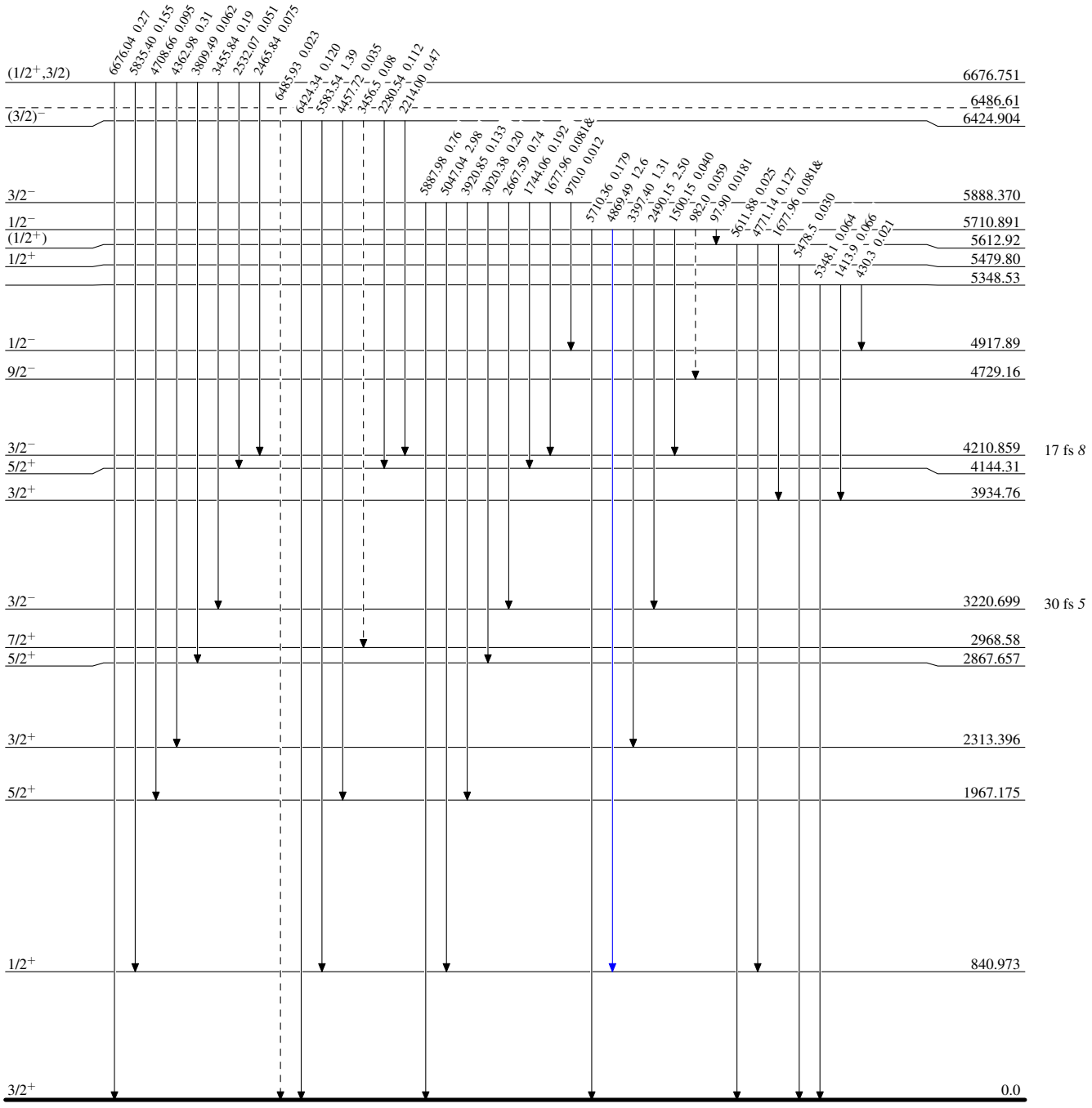
$^{33}_{16}S_{17}$

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures
& Multiply placed: undivided intensity given

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)



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

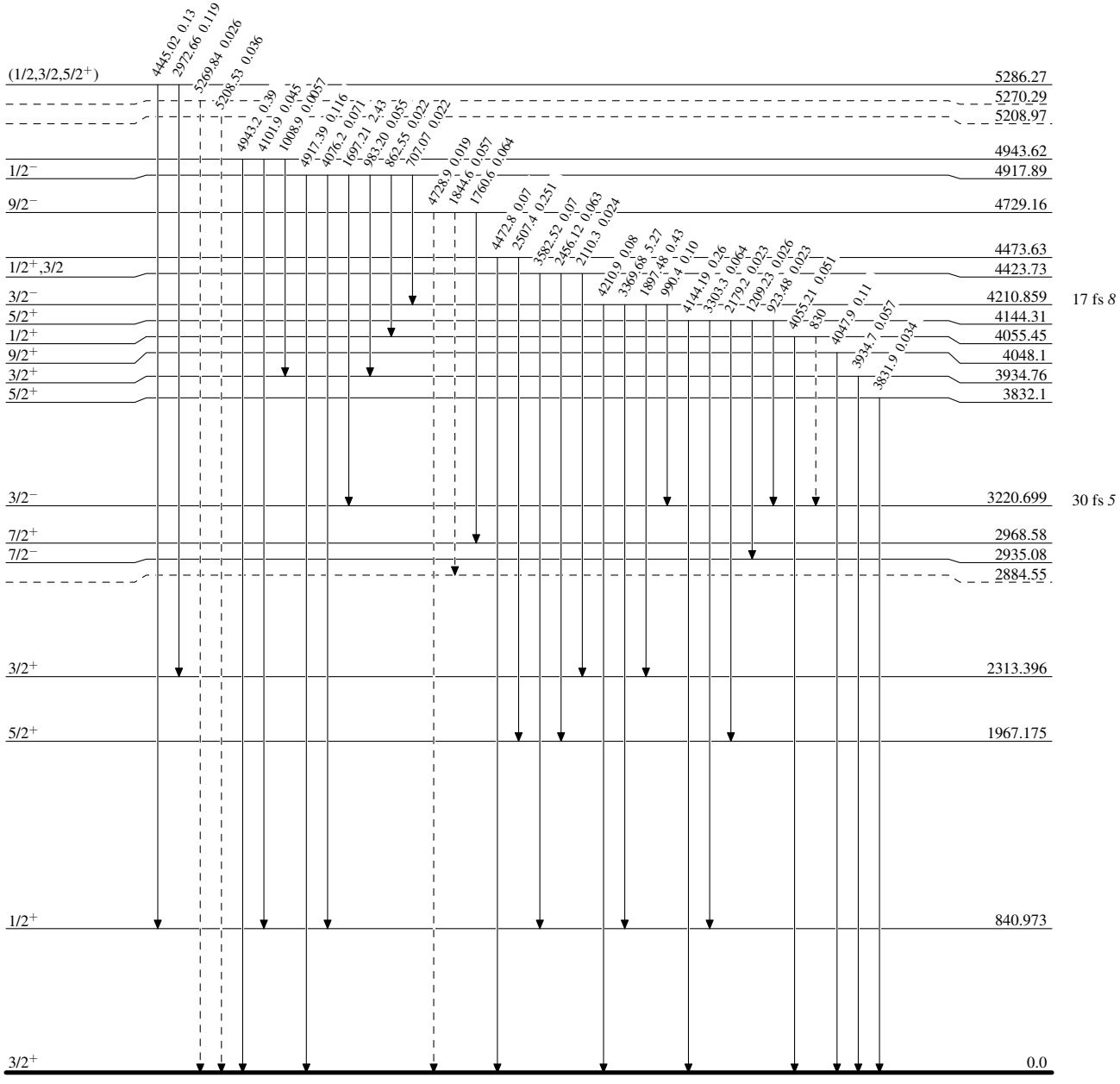
^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20

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)

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures
& Multiply placed: undivided intensity given

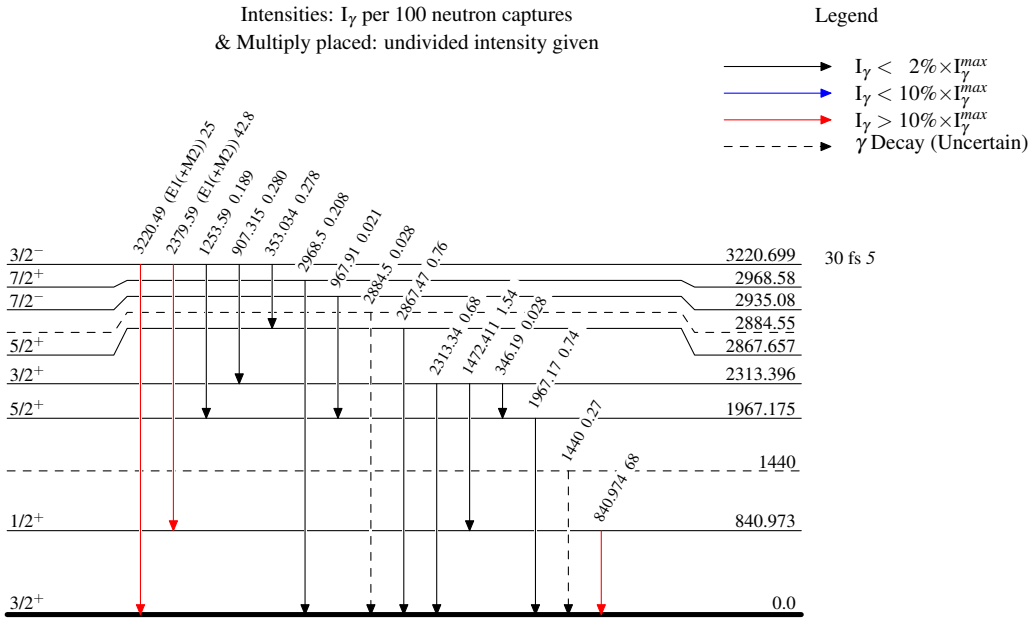


$^{33}_{16}S_{17}$

^{32}S(n,γ) E=thermal 1985Ra15,1985Ke08,1985Gu20

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures
& Multiply placed: undivided intensity given



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