^{232}Th(n,γ) E=0-69.1 eV 1972Vo08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	B. Singh, J. K. Tuli, E. Browne	NDS 170,499 (2020)	8-Oct-2020

1972Vo08: measured primary γ rays from <0.2−eV, 21.8-eV, 23.4-eV, 59.5-eV and 69.1-eV resonance neutron capture states ($1/2^+$) using a Ge(Li) detector at the BNL High-Flux Beam reactor facility.

^{233}Th Levels

E(level)[†]	J$^\pi$[#]	Comments
0.0	$1/2^+$	
16.8	$3/2^+$	
260.6	$(5/2)^+$	
309.5	(1/2,3/2)	
335.5	$3/2^+$	
367.0?[‡]		
388.3?[‡]	$(9/2^+)$	
405.8	(1/2,3/2)	
413.8	(1/2,3/2)	
424.3?[‡]		
539.8	$(1/2)^-$	
572.1?[‡]	$(3/2)^-$	
584.1	$(1/2)^+$	
614.1?[‡]		
632.8	(1/2,3/2)	
645.5	(1/2,3/2)	
681.6	$(1/2)^-$	
695.6	(1/2,3/2)	
713.5	$1/2^+$	
740.7	$(3/2)^-$	
749.9	(1/2,3/2)	
767.5	$(1/2,3/2)^+$	
818.6	$3/2^+$	
830.5	(1/2,3/2)	
840.5	$(3/2^-)$	
861.0	$1/2^+,3/2^+$	
874.3	$1/2,3/2,5/2^+$	
891.8	1/2,3/2	
903.6	$(1/2^+,3/2^+)$	
924.1	$(3/2)^-$	
946.7	$(3/2^-)$	
981.6	$(1/2^+,3/2^+)$	
1012.5	$1/2^-,3/2^-$	
1031.0	$1/2^-,3/2^-$	
1050.2	$(3/2)^-$	
1262.5	1/2,3/2	
1314.3	$(3/2)^-$	
1352.0	$(3/2)^-$	
1478.3	$1/2^-,3/2^-$	
1803.5	1/2,3/2	
1945.0	$1/2^-,3/2^-$	
(S(n)+0.0002)	$1/2^+$	E(level): S(n)+E(n), S(n)=4786.39 *9* (2017Wa10), E(n)<0.2 eV. J$^\pi$: assumed energy of neutrons near thermal energy, s-wave neutron capture.
(S(n)+0.0218)	$1/2^+$	E(level): S(n)=4786.39 *9* (2017Wa10). J$^\pi$: L=0 resonance (2018MuZZ).
(S(n)+0.0234)	$1/2^+$	E(level): S(n)=4786.39 *9* (2017Wa10).

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^{232}Th(n,γ) E=0-69.1 eV 1972Vo08 (continued)

^{233}Th Levels (continued)

E(level)[†]	J$^{\pi}$[#]	Comments
		J$^{\pi}$: L=0 resonances (2018MuZZ).
(S(n)+0.035 *35*)	(1/2$^+$)	E(level): S(n)=4786.39 *9* (2017Wa10); x=E(n)(in eV)=69.1+59.5+23.4+21.8+<0.2. J$^{\pi}$: L=0 for dominant resonances in this energy region.
(S(n)+0.0595)	1/2$^+$	E(level): S(n)=4786.39 *9* (2017Wa10). J$^{\pi}$: L=0 resonance (2018MuZZ).
(S(n)+0.0691)	1/2$^+$	E(level): S(n)=4786.39 *9* (2017Wa10). J$^{\pi}$: L=0 resonance (2018MuZZ).

[†] From 1972Vo08, based on primary γ transitions. Typical uncertainty for primary gamma-ray energy may be about 2 keV.
[‡] Level population is uncertain, not included in the Adopted Levels.
[#] Listed values are from the Adopted Levels, where all the data from different resonances and thermal capture have been considered.

γ(^{233}Th)

1972Vo08 suggest that transitions with summed intensity of 60±42 are E1, 11±8 are M1, and 1±1 are E2 by taking into account the Porter-Thomas fluctuations and assuming that gammas with summed intensity >32 are E1.

E$_{\gamma}$[†]	I$_{\gamma}$[‡&]	E$_i$(level)	J$_i^{\pi}$	E$_f$	J$_f^{\pi}$
2841.5 *20*	9 *5*	(S(n)+0.0002)	1/2$^+$	1945.0	1/2$^-$,3/2$^-$
2841.5 *20*	34 *7*	(S(n)+0.0218)	1/2$^+$	1945.0	1/2$^-$,3/2$^-$
2841.5 *20*	51 *10*	(S(n)+0.0234)	1/2$^+$	1945.0	1/2$^-$,3/2$^-$
2841.5 *20*	148.7[#]	(S(n)+0.035)	(1/2$^+$)	1945.0	1/2$^-$,3/2$^-$
2841.5[a] *20*	<10.3	(S(n)+0.0595)	1/2$^+$	1945.0	1/2$^-$,3/2$^-$
2841.5 *20*	55 *14*	(S(n)+0.0691)	1/2$^+$	1945.0	1/2$^-$,3/2$^-$
2983.0[a] *20*	<6.8	(S(n)+0.0002)	1/2$^+$	1803.5	1/2,3/2
2983.0 *20*	21 *3*	(S(n)+0.0218)	1/2$^+$	1803.5	1/2,3/2
2983.0[a] *20*	<3.0	(S(n)+0.0234)	1/2$^+$	1803.5	1/2,3/2
2983.0 *20*	28.0[#]	(S(n)+0.035)	(1/2$^+$)	1803.5	1/2,3/2
2983.0 *20*	7 *4*	(S(n)+0.0595)	1/2$^+$	1803.5	1/2,3/2
2983.0[a] *20*	<6.2	(S(n)+0.0691)	1/2$^+$	1803.5	1/2,3/2
3308.2[a] *20*	<6.8	(S(n)+0.0002)	1/2$^+$	1478.3	1/2$^-$,3/2$^-$
3308.2 *20*	1.7 *13*	(S(n)+0.0218)	1/2$^+$	1478.3	1/2$^-$,3/2$^-$
3308.2 *20*	9 *3*	(S(n)+0.0234)	1/2$^+$	1478.3	1/2$^-$,3/2$^-$
3308.2 *20*	16.0[#]	(S(n)+0.035)	(1/2$^+$)	1478.3	1/2$^-$,3/2$^-$
3308.2 *20*	5 *3*	(S(n)+0.0595)	1/2$^+$	1478.3	1/2$^-$,3/2$^-$
3308.2[a] *20*	<6.2	(S(n)+0.0691)	1/2$^+$	1478.3	1/2$^-$,3/2$^-$
3434.5 *20*	18 *3*	(S(n)+0.0002)	1/2$^+$	1352.0	(3/2)$^-$
3434.5[a] *20*	<3.0	(S(n)+0.0218)	1/2$^+$	1352.0	(3/2)$^-$
3434.5[a] *20*	<3.0	(S(n)+0.0234)	1/2$^+$	1352.0	(3/2)$^-$
3434.5 *20*	18.4[#]	(S(n)+0.035)	(1/2$^+$)	1352.0	(3/2)$^-$
3434.5[a] *20*	<4.7	(S(n)+0.0595)	1/2$^+$	1352.0	(3/2)$^-$
3434.5[a] *20*	<6.2	(S(n)+0.0691)	1/2$^+$	1352.0	(3/2)$^-$
3472.2 *20*	29 *3*	(S(n)+0.0002)	1/2$^+$	1314.3	(3/2)$^-$
3472.2[a] *20*	<3.4	(S(n)+0.0218)	1/2$^+$	1314.3	(3/2)$^-$
3472.2[a] *20*	<3.4	(S(n)+0.0234)	1/2$^+$	1314.3	(3/2)$^-$
3472.2 *20*	50.3[#]	(S(n)+0.035)	(1/2$^+$)	1314.3	(3/2)$^-$
3472.2[a] *20*	<4.7	(S(n)+0.0595)	1/2$^+$	1314.3	(3/2)$^-$
3472.2 *20*	22 *5*	(S(n)+0.0691)	1/2$^+$	1314.3	(3/2)$^-$
3524.0 *20*	12 *3*	(S(n)+0.0002)	1/2$^+$	1262.5	1/2,3/2

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^{232}Th(n,γ) E=0-69.1 eV 1972Vo08 (continued)

$\gamma(^{233}Th)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
3524.0 *20*	8 *3*	(S(n)+0.0218)	$1/2^+$	1262.5	1/2,3/2
3524.0 *20*	7 *3*	(S(n)+0.0234)	$1/2^+$	1262.5	1/2,3/2
3524.0 *20*	27.8#	(S(n)+0.035)	$(1/2^+)$	1262.5	1/2,3/2
3524.0[a] *20*	<4.7	(S(n)+0.0595)	$1/2^+$	1262.5	1/2,3/2
3524.0[a] *20*	<6.2	(S(n)+0.0691)	$1/2^+$	1262.5	1/2,3/2
3736.3 *20*	11.6 *17*	(S(n)+0.0002)	$1/2^+$	1050.2	$(3/2)^-$
3736.3 *20*	11.6 *13*	(S(n)+0.0218)	$1/2^+$	1050.2	$(3/2)^-$
3736.3 *20*	3.8 *11*	(S(n)+0.0234)	$1/2^+$	1050.2	$(3/2)^-$
3736.3 *20*	65.9#	(S(n)+0.035)	$(1/2^+)$	1050.2	$(3/2)^-$
3736.3 *20*	21.8 *24*	(S(n)+0.0595)	$1/2^+$	1050.2	$(3/2)^-$
3736.3 *20*	17.1 *24*	(S(n)+0.0691)	$1/2^+$	1050.2	$(3/2)^-$
3755.5 *20*	6.2 *13*	(S(n)+0.0002)	$1/2^+$	1031.0	$1/2^-$,$3/2^-$
3755.5 *20*	21.6 *13*	(S(n)+0.0218)	$1/2^+$	1031.0	$1/2^-$,$3/2^-$
3755.5 *20*	5.1 *11*	(S(n)+0.0234)	$1/2^+$	1031.0	$1/2^-$,$3/2^-$
3755.5 *20*	58.9#	(S(n)+0.035)	$(1/2^+)$	1031.0	$1/2^-$,$3/2^-$
3755.5 *20*	8.2 *21*	(S(n)+0.0595)	$1/2^+$	1031.0	$1/2^-$,$3/2^-$
3755.5 *20*	18 *3*	(S(n)+0.0691)	$1/2^+$	1031.0	$1/2^-$,$3/2^-$
3774.0[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	1012.5	$1/2^-$,$3/2^-$
3774.0[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	1012.5	$1/2^-$,$3/2^-$
3774.0 *20*	14.3 *11*	(S(n)+0.0234)	$1/2^+$	1012.5	$1/2^-$,$3/2^-$
3774.0 *20*	51.5#	(S(n)+0.035)	$(1/2^+)$	1012.5	$1/2^-$,$3/2^-$
3774.0 *20*	21 *4*	(S(n)+0.0595)	$1/2^+$	1012.5	$1/2^-$,$3/2^-$
3774.0 *20*	16 *3*	(S(n)+0.0691)	$1/2^+$	1012.5	$1/2^-$,$3/2^-$
3804.9 *20*	6.4 *17*	(S(n)+0.0002)	$1/2^+$	981.6	$(1/2^+,3/2^+)$
3804.9[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	981.6	$(1/2^+,3/2^+)$
3804.9 *20*	7 *3*	(S(n)+0.0234)	$1/2^+$	981.6	$(1/2^+,3/2^+)$
3804.9 *20*	13.2#	(S(n)+0.035)	$(1/2^+)$	981.6	$(1/2^+,3/2^+)$
3804.9[a] *20*	<3.4	(S(n)+0.0595)	$1/2^+$	981.6	$(1/2^+,3/2^+)$
3804.9[a] *20*	<3.4	(S(n)+0.0691)	$1/2^+$	981.6	$(1/2^+,3/2^+)$
3839.8 *20*	4.1 *21*	(S(n)+0.0002)	$1/2^+$	946.7	$(3/2^-)$
3839.8 *20*	9.6 *21*	(S(n)+0.0218)	$1/2^+$	946.7	$(3/2^-)$
3839.8 *20*	6 *3*	(S(n)+0.0234)	$1/2^+$	946.7	$(3/2^-)$
3839.8 *20*	50.4#	(S(n)+0.035)	$(1/2^+)$	946.7	$(3/2^-)$
3839.8 *20*	6.4 *21*	(S(n)+0.0595)	$1/2^+$	946.7	$(3/2^-)$
3839.8 *20*	24 *3*	(S(n)+0.0691)	$1/2^+$	946.7	$(3/2^-)$
3862.4[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	924.1	$(3/2)^-$
3862.4 *20*	18.4 *21*	(S(n)+0.0218)	$1/2^+$	924.1	$(3/2)^-$
3862.4 *20*	18 *3*	(S(n)+0.0234)	$1/2^+$	924.1	$(3/2)^-$
3862.4 *20*	69.0#	(S(n)+0.035)	$(1/2^+)$	924.1	$(3/2)^-$
3862.4 *20*	19 *3*	(S(n)+0.0595)	$1/2^+$	924.1	$(3/2)^-$
3862.4 *20*	14 *3*	(S(n)+0.0691)	$1/2^+$	924.1	$(3/2)^-$
3882.9 *20*	2.8 *21*	(S(n)+0.0002)	$1/2^+$	903.6	$(1/2^+,3/2^+)$
3882.9[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	903.6	$(1/2^+,3/2^+)$
3882.9 *20*	12.0 *13*	(S(n)+0.0234)	$1/2^+$	903.6	$(1/2^+,3/2^+)$
3882.9 *20*	19.5#	(S(n)+0.035)	$(1/2^+)$	903.6	$(1/2^+,3/2^+)$
3882.9[a] *20*	<3.4	(S(n)+0.0595)	$1/2^+$	903.6	$(1/2^+,3/2^+)$
3882.9 *20*	4.7 *21*	(S(n)+0.0691)	$1/2^+$	903.6	$(1/2^+,3/2^+)$
3894.7[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	891.8	1/2,3/2
3894.7 *20*	9.2 *13*	(S(n)+0.0218)	$1/2^+$	891.8	1/2,3/2
3894.7 *20*	11.3 *13*	(S(n)+0.0234)	$1/2^+$	891.8	1/2,3/2
3894.7 *20*	32.4#	(S(n)+0.035)	$(1/2^+)$	891.8	1/2,3/2
3894.7 *20*	6.8 *17*	(S(n)+0.0595)	$1/2^+$	891.8	1/2,3/2

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^{232}Th(n,γ) E=0-69.1 eV 1972Vo08 (continued)

$\gamma(^{233}Th)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
3894.7 *20*	5.1 *21*	(S(n)+0.0691)	$1/2^+$	891.8	1/2,3/2
3912.2[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	874.3	$1/2,3/2,5/2^+$
3912.2 *20*	4.1 *13*	(S(n)+0.0218)	$1/2^+$	874.3	$1/2,3/2,5/2^+$
3912.2[a] *20*	<2.8	(S(n)+0.0234)	$1/2^+$	874.3	$1/2,3/2,5/2^+$
3912.2 *20*	15.8#	(S(n)+0.035)	$(1/2^+)$	874.3	$1/2,3/2,5/2^+$
3912.2 *20*	8.9 *17*	(S(n)+0.0595)	$1/2^+$	874.3	$1/2,3/2,5/2^+$
3912.2 *20*	2.8 *21*	(S(n)+0.0691)	$1/2^+$	874.3	$1/2,3/2,5/2^+$
3925.5[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	861.0	$1/2^+,3/2^+$
3925.5[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	861.0	$1/2^+,3/2^+$
3925.5 *20*	3.0 *13*	(S(n)+0.0234)	$1/2^+$	861.0	$1/2^+,3/2^+$
3925.5 *20*	9.8#	(S(n)+0.035)	$(1/2^+)$	861.0	$1/2^+,3/2^+$
3925.5 *20*	6.8 *17*	(S(n)+0.0595)	$1/2^+$	861.0	$1/2^+,3/2^+$
3925.5[a] *20*	<3.4	(S(n)+0.0691)	$1/2^+$	861.0	$1/2^+,3/2^+$
3946.0 *20*	17.1 *21*	(S(n)+0.0002)	$1/2^+$	840.5	$(3/2^-)$
3946.0 *20*	11.3 *21*	(S(n)+0.0218)	$1/2^+$	840.5	$(3/2^-)$
3946.0 *20*	5.8 *13*	(S(n)+0.0234)	$1/2^+$	840.5	$(3/2^-)$
3946.0 *20*	43.8#	(S(n)+0.035)	$(1/2^+)$	840.5	$(3/2^-)$
3946.0 *20*	9.6 *24*	(S(n)+0.0595)	$1/2^+$	840.5	$(3/2^-)$
3946.0[a] *20*	<3.4	(S(n)+0.0691)	$1/2^+$	840.5	$(3/2^-)$
3956.0[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	830.5	(1/2,3/2)
3956.0 *20*	3.0 *17*	(S(n)+0.0218)	$1/2^+$	830.5	(1/2,3/2)
3956.0 *20*	2.1 *13*	(S(n)+0.0234)	$1/2^+$	830.5	(1/2,3/2)
3956.0 *20*	12.6#	(S(n)+0.035)	$(1/2^+)$	830.5	(1/2,3/2)
3956.0[a] *20*	<3.4	(S(n)+0.0595)	$1/2^+$	830.5	(1/2,3/2)
3956.0 *20*	7.5 *21*	(S(n)+0.0691)	$1/2^+$	830.5	(1/2,3/2)
3967.9[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	818.6	$3/2^+$
3967.9[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	818.6	$3/2^+$
3967.9 *20*	10.7 *21*	(S(n)+0.0234)	$1/2^+$	818.6	$3/2^+$
3967.9 *20*	19.9#	(S(n)+0.035)	$(1/2^+)$	818.6	$3/2^+$
3967.9 *20*	6.4 *17*	(S(n)+0.0595)	$1/2^+$	818.6	$3/2^+$
3967.9 *20*	2.8 *21*	(S(n)+0.0691)	$1/2^+$	818.6	$3/2^+$
4019.0 *20*	1.3 *13*	(S(n)+0.0002)	$1/2^+$	767.5	$(1/2,3/2)^+$
4019.0 *20*	1.1 *11*	(S(n)+0.0218)	$1/2^+$	767.5	$(1/2,3/2)^+$
4019.0 *20*	1.3 *13*	(S(n)+0.0234)	$1/2^+$	767.5	$(1/2,3/2)^+$
4019.0 *20*	14.6#	(S(n)+0.035)	$(1/2^+)$	767.5	$(1/2,3/2)^+$
4019.0 *20*	1.7 *17*	(S(n)+0.0595)	$1/2^+$	767.5	$(1/2,3/2)^+$
4019.0 *20*	9.2 *21*	(S(n)+0.0691)	$1/2^+$	767.5	$(1/2,3/2)^+$
4036.6 *20*	3.4 *13*	(S(n)+0.0002)	$1/2^+$	749.9	(1/2,3/2)
4036.6 *20*	1.7 *11*	(S(n)+0.0218)	$1/2^+$	749.9	(1/2,3/2)
4036.6 *20*	6.4 *11*	(S(n)+0.0234)	$1/2^+$	749.9	(1/2,3/2)
4036.6 *20*	13.9#	(S(n)+0.035)	$(1/2^+)$	749.9	(1/2,3/2)
4036.6 *20*	2.4 *17*	(S(n)+0.0595)	$1/2^+$	749.9	(1/2,3/2)
4036.6[a] *20*	<2.8	(S(n)+0.0691)	$1/2^+$	749.9	(1/2,3/2)
4045.8 *20*	7.2 *13*	(S(n)+0.0002)	$1/2^+$	740.7	$(3/2)^-$
4045.8 *20*	3.4 *13*	(S(n)+0.0218)	$1/2^+$	740.7	$(3/2)^-$
4045.8 *20*	10.9 *11*	(S(n)+0.0234)	$1/2^+$	740.7	$(3/2)^-$
4045.8 *20*	48.8#	(S(n)+0.035)	$(1/2^+)$	740.7	$(3/2)^-$
4045.8 *20*	12.6 *21*	(S(n)+0.0595)	$1/2^+$	740.7	$(3/2)^-$
4045.8 *20*	15 *3*	(S(n)+0.0691)	$1/2^+$	740.7	$(3/2)^-$
4073.0 *20*	7.5 *13*	(S(n)+0.0002)	$1/2^+$	713.5	$1/2^+$
4073.0 *20*	5.5 *11*	(S(n)+0.0218)	$1/2^+$	713.5	$1/2^+$
4073.0[a] *20*	<2.1	(S(n)+0.0234)	$1/2^+$	713.5	$1/2^+$

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^{232}Th(n,γ) E=0-69.1 eV 1972Vo08 (continued)

$\gamma(^{233}Th)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
4073.0 *20*	33.9#	(S(n)+0.035)	(1/2$^+$)	713.5	1/2$^+$
4073.0 *20*	6 *3*	(S(n)+0.0595)	1/2$^+$	713.5	1/2$^+$
4073.0 *20*	15 *3*	(S(n)+0.0691)	1/2$^+$	713.5	1/2$^+$
4090.9 *20*	3.0 *13*	(S(n)+0.0002)	1/2$^+$	695.6	(1/2,3/2)
4090.9[a] *20*	<2.1	(S(n)+0.0218)	1/2$^+$	695.6	(1/2,3/2)
4090.9[a] *20*	<2.1	(S(n)+0.0234)	1/2$^+$	695.6	(1/2,3/2)
4090.9 *20*	9.8#	(S(n)+0.035)	(1/2$^+$)	695.6	(1/2,3/2)
4090.9 *20*	7 *3*	(S(n)+0.0595)	1/2$^+$	695.6	(1/2,3/2)
4090.9[a] *20*	<3.4	(S(n)+0.0691)	1/2$^+$	695.6	(1/2,3/2)
4104.9[a] *20*	<2.8	(S(n)+0.0002)	1/2$^+$	681.6	(1/2)$^-$
4104.9 *20*	17.1 *21*	(S(n)+0.0218)	1/2$^+$	681.6	(1/2)$^-$
4104.9 *20*	41.0 *21*	(S(n)+0.0234)	1/2$^+$	681.6	(1/2)$^-$
4104.9 *20*	78.7#	(S(n)+0.035)	(1/2$^+$)	681.6	(1/2)$^-$
4104.9 *20*	8.2 *21*	(S(n)+0.0595)	1/2$^+$	681.6	(1/2)$^-$
4104.9 *20*	12 *3*	(S(n)+0.0691)	1/2$^+$	681.6	(1/2)$^-$
4141.0[a] *20*	<2.8	(S(n)+0.0002)	1/2$^+$	645.5	(1/2,3/2)
4141.0 *20*	3.8 *11*	(S(n)+0.0218)	1/2$^+$	645.5	(1/2,3/2)
4141.0 *20*	3.4 *11*	(S(n)+0.0234)	1/2$^+$	645.5	(1/2,3/2)
4141.0 *20*	20.6#	(S(n)+0.035)	(1/2$^+$)	645.5	(1/2,3/2)
4141.0 *20*	8.9 *21*	(S(n)+0.0595)	1/2$^+$	645.5	(1/2,3/2)
4141.0 *20*	4.5 *21*	(S(n)+0.0691)	1/2$^+$	645.5	(1/2,3/2)
4153.7[a] *20*	<2.8	(S(n)+0.0002)	1/2$^+$	632.8	(1/2,3/2)
4153.7[a] *20*	<2.8	(S(n)+0.0218)	1/2$^+$	632.8	(1/2,3/2)
4153.7 *20*	5.1 *11*	(S(n)+0.0234)	1/2$^+$	632.8	(1/2,3/2)
4153.7 *20*	5.1#	(S(n)+0.035)	(1/2$^+$)	632.8	(1/2,3/2)
4153.7[a] *20*	<3.4	(S(n)+0.0595)	1/2$^+$	632.8	(1/2,3/2)
4153.7[a] *20*	<3.4	(S(n)+0.0691)	1/2$^+$	632.8	(1/2,3/2)
4172.4 *20*	≤6.2@	(S(n)+0.0002)	1/2$^+$	614.1?	
4172.4 *20*	≤3.4@	(S(n)+0.0218)	1/2$^+$	614.1?	
4172.4[a] *20*	<2.1	(S(n)+0.0234)	1/2$^+$	614.1?	
4172.4 *20*	≤17.8#@	(S(n)+0.035)	(1/2$^+$)	614.1?	
4172.4 *20*	≤8.2@	(S(n)+0.0595)	1/2$^+$	614.1?	
4172.4[a] *20*	<3.4	(S(n)+0.0691)	1/2$^+$	614.1?	
4202.4 *20*	8.2 *13*	(S(n)+0.0002)	1/2$^+$	584.1	(1/2)$^+$
4202.4 *20*	4.1 *17*	(S(n)+0.0218)	1/2$^+$	584.1	(1/2)$^+$
4202.4 *20*	7.2 *11*	(S(n)+0.0234)	1/2$^+$	584.1	(1/2)$^+$
4202.4 *20*	28.0#	(S(n)+0.035)	(1/2$^+$)	584.1	(1/2)$^+$
4202.4 *20*	8.5 *24*	(S(n)+0.0595)	1/2$^+$	584.1	(1/2)$^+$
4202.4[a] *20*	<3.4	(S(n)+0.0691)	1/2$^+$	584.1	(1/2)$^+$
4214.4 *20*	≤6.2@	(S(n)+0.0002)	1/2$^+$	572.1?	(3/2)$^-$
4214.4 *20*	≤5.1@	(S(n)+0.0218)	1/2$^+$	572.1?	(3/2)$^-$
4214.4 *20*	≤21.8@	(S(n)+0.0234)	1/2$^+$	572.1?	(3/2)$^-$
4214.4 *20*	≤78.2#@	(S(n)+0.035)	(1/2$^+$)	572.1?	(3/2)$^-$
4214.4 *20*	≤4.7@	(S(n)+0.0595)	1/2$^+$	572.1?	(3/2)$^-$
4214.4 *20*	≤40@	(S(n)+0.0691)	1/2$^+$	572.1?	(3/2)$^-$
4246.7 *20*	7.5 *13*	(S(n)+0.0002)	1/2$^+$	539.8	(1/2)$^-$
4246.7 *20*	6.8 *13*	(S(n)+0.0218)	1/2$^+$	539.8	(1/2)$^-$
4246.7 *20*	8.2 *11*	(S(n)+0.0234)	1/2$^+$	539.8	(1/2)$^-$
4246.7 *20*	36.2#	(S(n)+0.035)	(1/2$^+$)	539.8	(1/2)$^-$
4246.7 *20*	5.8 *24*	(S(n)+0.0595)	1/2$^+$	539.8	(1/2)$^-$

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^{232}Th(n,γ) E=0-69.1 eV 1972Vo08 (continued)

$\gamma(^{233}Th)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
4246.7 *20*	7.9 *21*	(S(n)+0.0691)	$1/2^+$	539.8	$(1/2)^-$
4362.2 *20*	≤4.1@	(S(n)+0.0002)	$1/2^+$	424.3?	
4362.2[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	424.3?	
4362.2 *20*	≤7.9@	(S(n)+0.0234)	$1/2^+$	424.3?	
4362.2 *20*	≤16.1#@	(S(n)+0.035)	$(1/2^+)$	424.3?	
4362.2 *20*	≤4.1@	(S(n)+0.0595)	$1/2^+$	424.3?	
4362.2[a] *20*	<3.4	(S(n)+0.0691)	$1/2^+$	424.3?	
4372.7[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	413.8	(1/2,3/2)
4372.7[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	413.8	(1/2,3/2)
4372.7[a] *20*	<2.1	(S(n)+0.0234)	$1/2^+$	413.8	(1/2,3/2)
4372.7 *20*	18.8#	(S(n)+0.035)	$(1/2^+)$	413.8	(1/2,3/2)
4372.7 *20*	12.6 *21*	(S(n)+0.0595)	$1/2^+$	413.8	(1/2,3/2)
4372.7 *20*	6.2 *21*	(S(n)+0.0691)	$1/2^+$	413.8	(1/2,3/2)
4380.7[a] *20*	<2.8	(S(n)+0.0002)	$1/2^+$	405.8	(1/2,3/2)
4380.7[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	405.8	(1/2,3/2)
4380.7[a] *20*	<2.1	(S(n)+0.0234)	$1/2^+$	405.8	(1/2,3/2)
4380.7 *20*	6.8#	(S(n)+0.035)	$(1/2^+)$	405.8	(1/2,3/2)
4380.7 *20*	6.8 *21*	(S(n)+0.0595)	$1/2^+$	405.8	(1/2,3/2)
4380.7[a] *20*	<3.4	(S(n)+0.0691)	$1/2^+$	405.8	(1/2,3/2)
4398.2 *20*	≤4.7@	(S(n)+0.0002)	$1/2^+$	388.3?	$(9/2^+)$
4398.2[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	388.3?	$(9/2^+)$
4398.2[a] *20*	<2.1	(S(n)+0.0234)	$1/2^+$	388.3?	$(9/2^+)$
4398.2 *20*	≤4.7#@	(S(n)+0.035)	$(1/2^+)$	388.3?	$(9/2^+)$
4398.2[a] *20*	<3.1	(S(n)+0.0595)	$1/2^+$	388.3?	$(9/2^+)$
4398.2[a] *20*	<3.4	(S(n)+0.0691)	$1/2^+$	388.3?	$(9/2^+)$
4419.5 *20*	≤4.5@	(S(n)+0.0002)	$1/2^+$	367.0?	
4419.5[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	367.0?	
4419.5[a] *20*	<2.1	(S(n)+0.0234)	$1/2^+$	367.0?	
4419.5 *20*	≤4.5#@	(S(n)+0.035)	$(1/2^+)$	367.0?	
4419.5[a] *20*	<3.4	(S(n)+0.0595)	$1/2^+$	367.0?	
4419.5 *20*	<3.4	(S(n)+0.0691)	$1/2^+$	367.0?	
4451.0 *20*	2.4 *11*	(S(n)+0.0002)	$1/2^+$	335.5	$3/2^+$
4451.0 *20*	3.8 *13*	(S(n)+0.0218)	$1/2^+$	335.5	$3/2^+$
4451.0 *20*	4.5 *11*	(S(n)+0.0234)	$1/2^+$	335.5	$3/2^+$
4451.0 *20*	28.4#	(S(n)+0.035)	$(1/2^+)$	335.5	$3/2^+$
4451.0 *20*	9 *3*	(S(n)+0.0595)	$1/2^+$	335.5	$3/2^+$
4451.0 *20*	9.2 *21*	(S(n)+0.0691)	$1/2^+$	335.5	$3/2^+$
4477.0 *20*	2.8 *11*	(S(n)+0.0002)	$1/2^+$	309.5	(1/2,3/2)
4477.0 *20*	2.4 *11*	(S(n)+0.0218)	$1/2^+$	309.5	(1/2,3/2)
4477.0 *20*	2.1 *11*	(S(n)+0.0234)	$1/2^+$	309.5	(1/2,3/2)
4477.0 *20*	27.1#	(S(n)+0.035)	$(1/2^+)$	309.5	(1/2,3/2)
4477.0 *20*	14.3 *24*	(S(n)+0.0595)	$1/2^+$	309.5	(1/2,3/2)
4477.0 *20*	5.5 *17*	(S(n)+0.0691)	$1/2^+$	309.5	(1/2,3/2)
4525.9 *20*	3.7 *11*	(S(n)+0.0002)	$1/2^+$	260.6	$(5/2)^+$
4525.9[a] *20*	<2.8	(S(n)+0.0218)	$1/2^+$	260.6	$(5/2)^+$
4525.9 *20*	2.8 *11*	(S(n)+0.0234)	$1/2^+$	260.6	$(5/2)^+$
4525.9 *20*	10.3#	(S(n)+0.035)	$(1/2^+)$	260.6	$(5/2)^+$
4525.9[a] *20*	<3.4	(S(n)+0.0595)	$1/2^+$	260.6	$(5/2)^+$
4525.9 *20*	3.0 *17*	(S(n)+0.0691)	$1/2^+$	260.6	$(5/2)^+$
4769.7[a] *20*		(S(n)+0.0002)	$1/2^+$	16.8	$3/2^+$

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^{232}Th(n,γ) E=0-69.1 eV 1972Vo08 (continued)

$\gamma(^{233}Th)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
4769.7[a] *20*		(S(n)+0.0218)	$1/2^+$	16.8	$3/2^+$
4769.7[a] *20*		(S(n)+0.0234)	$1/2^+$	16.8	$3/2^+$
4769.7[a] *20*	<10.5[#]	(S(n)+0.035)	$(1/2^+)$	16.8	$3/2^+$
4769.7[a] *20*		(S(n)+0.0595)	$1/2^+$	16.8	$3/2^+$
4769.7[a] *20*		(S(n)+0.0691)	$1/2^+$	16.8	$3/2^+$
4786.5[a] *20*		(S(n)+0.0002)	$1/2^+$	0.0	$1/2^+$
4786.5[a] *20*		(S(n)+0.0218)	$1/2^+$	0.0	$1/2^+$
4786.5[a] *20*		(S(n)+0.0234)	$1/2^+$	0.0	$1/2^+$
4786.5[a] *20*	<7.9[#]	(S(n)+0.035)	$(1/2^+)$	0.0	$1/2^+$
4786.5[a] *20*		(S(n)+0.0595)	$1/2^+$	0.0	$1/2^+$
4786.5[a] *20*		(S(n)+0.0691)	$1/2^+$	0.0	$1/2^+$

† From 1972Vo08.
‡ From 1972Vo08 per 1000 neutron captures.
# Summed intensity of over five resonant states per 1000 neutron captures (1972Vo08).
@ Gamma-ray peak is contaminated by an undetermined full-energy peak contribution from lines located 1022 keV below the listed peak, thus the quoted intensity is an upper limit.
& For intensity per 100 neutron captures, multiply by 0.1.
a Placement of transition in the level scheme is uncertain.