

$^{89}\text{Y}(n,\gamma)$ E=thermal **1993Mi04**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, E. A. Mccutchan		NDS 165, 1 (2020)	1-Mar-2020

$J^\pi(^{89}\text{Y})=1/2^-$.

1993Mi04: detector: HPGe surrounded by two NaI scintillator detectors. This detecting system was operated in Compton-suppressed mode for γ -ray energies <3500 keV, and as a pair spectrometer for γ -ray energies >2000 keV. FWHM=1.9 keV for 2000-keV γ rays, and 4 keV for 7000-keV γ rays. The energy and efficiency of the detector were calibrated with ^{36}Cl . Since a strong γ ray in ^{36}Cl is at 517 keV, this was the lowest calibration energy for the detector efficiency. Consequently, the authors did not report intensities for γ rays below this energy. Values given here for $E_\gamma < 517$ keV are from **1983De27**. The detector efficiency was calibrated on an absolute scale (per 100 neutrons captured) by using a target of NaCl mixed with the Yttrium target and using thermal-neutron cross section values of 1.28 b and 43.6 b for ^{89}Y and ^{35}Cl , respectively. The neutron binding energy was determined to be $S(n)=6857.02$ keV *17*, in good agreement with $S(n)=6857.26$ keV *30* (**1983De27**).

1993Mi04 did not confirm the following levels reported by **1983De27**: 2003, 2055, 2139, 2184, 2208, 2324, 2405, 2423, 2430, 2565, 2590, 2646, 2903, 3172, and 3301. **1993Mi04** found alternative placements in the level scheme of ^{90}Y for most of the transitions that defined these levels.

Other measurements:

1983De27: E=thermal. Measured E_γ , I_γ . Detectors: Ge(Li) and annulus.

1970Ei03: E=thermal. Polarized neutrons. Measured E_γ , circular polarization. Detector: NaI.

1969Ch30: E=thermal. Measured $\gamma\gamma(\theta)$. Detector: NaI.

1981Ra07: E=1-6 keV. Measured γ rays. Detector: Ge(Li).

Others: **1967Ir01**, **1986Vo03**, **1987Zo02**, **1988Ho06**, **1991Cu01**, **1991Zh22**, **1995Li31**.

 ^{90}Y Levels

E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]
0.0	2 ⁻	2196.119 <i>21</i>	(1 ⁻ ,2)	2992.35 <i>4</i>	2 ⁻ ,(1 ⁻)	3953.54 <i>4</i>	1,2
202.493 <i>12</i>	3 ⁻	2244.30 <i>3</i>	1 ⁺ ,2 ⁻	3002.68 <i>4</i>	(1 ⁻ ,2)	4037.54 <i>3</i>	1,2 ⁻
681.66 <i>9</i>	7 ⁺	2365.963 <i>21</i>	1 ⁻	3043.50 <i>4</i>	(2,3 ⁻)	4100.49 <i>4</i>	1,2 ⁻
776.592 <i>15</i>	2 ⁺ #	2475.92 <i>3</i>	2 ⁻	3143.83 <i>3</i>	2	4161.28 <i>4</i>	(1,2)
953.512 <i>17</i>	3 ⁺	2495.48 <i>3</i>	(2)	3160.210 <i>24</i>	1 ⁻	4210.80 <i>4</i>	(1,2)
1046.87 <i>15</i>	5 ⁺	2504.612 <i>23</i>	2 ⁻	3312.407 <i>25</i>	2,(1 ⁻)	4267.38 <i>3</i>	1,2
1189.68 <i>8</i>	4 ⁺	2623.99 <i>4</i>	1 ⁻	3404.82 <i>5</i>	2 ⁻ ,(3 ⁻)	4325.06 <i>5</i>	1 ⁻ ,2 ⁻
1211.577 <i>17</i>	0 ⁻	2631.93 <i>4</i>	(2,3 ⁻)	3469.13 <i>4</i>	2,3 ⁻	4451.574 <i>24</i>	1,2
1371.132 <i>15</i>	1 ⁻	2663.28 <i>4</i>	(1,2) ⁻	3476.06 <i>3</i>	1,2	4515.93 <i>3</i>	(1,2)
1416.579 <i>16</i>	3 ⁻ ,(2 ⁻)	2719.35 <i>3</i>	(1,2) ⁻	3555.725 <i>19</i>	1,2	4529.65 <i>4</i>	0 ⁻ ,1,2
1571.613 <i>17</i>	2 ⁻ ,(3 ⁻)	2749.239 <i>19</i>	2	3574.501 <i>23</i>	1 ⁻	4533.14 <i>4</i>	2 ⁻ ,(1 ⁻)
1640.914 <i>16</i>	1 ⁻	2758.076 <i>20</i>	1 ⁻ ,2 ⁻	3602.07 <i>3</i>	1 ⁻	4835.05 <i>4</i>	1,2
1760.976 <i>18</i>	2 ⁻	2838.32 <i>3</i>	1 ⁺ ,2	3627.647 <i>25</i>	1 ⁻	6856.992 <i>12</i>	1 ⁻
1811.01 <i>4</i>	3 ⁻ ,(2 ⁻)	2847.42 <i>4</i>	1 ⁻	3685.23 <i>4</i>	1,2		
1815.151 <i>22</i>	1 ⁺	2859.34 <i>3</i>	2 ⁻ ,(3 ⁻)	3692.29 <i>3</i>	1 ⁻		
2133.501 <i>23</i>	1,2 ⁻	2986.10 <i>3</i>	2	3934.47 <i>3</i>	1 ⁻		

[†] From a least-squares fit to γ -ray energies from **1993Mi04**.

[‡] Spin and parity assignments are those in **1993Mi04**. These assignments are based on the assumption that γ -ray multi-polarities are E1, M1, or E2. For levels also populated in (d,p), spin and parity assignments are mainly from (d,p).

From measured circular polarization of primary γ ray (assumed E1) to this level (**1970Ei03**).

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$

A total of 893 γ rays assigned to ^{90}Y were observed, but only 391 placed in the decay scheme, and 27 unplaced have been reported in **1993Mi04**.

E_γ^\dagger	$I_\gamma^\ddagger@$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
$^{x}139.00^\# 18$	0.008 $^\# 8$				
142.47 $^\#a 13$	0.016 $^\# 8$	1189.68	4 $^+$	1046.87	5 $^+$
$^{x}155.44^\# 21$	0.008 $^\# 8$				
159.50 13	0.016 $^\ddagger 8$	1371.132	1 $^-$	1211.577	0 $^-$
176.91 3	0.59 $^\ddagger 12$	953.512	3 $^+$	776.592	2 $^+$
$^{x}182.05^\# 11$	0.094 $^\# 23$				
202.51 3	16 $^\ddagger 4$	202.493	3 $^-$	0.0	2 $^-$
236.17 7	0.12 $^\ddagger 2$	1189.68	4 $^+$	953.512	3 $^+$
$^{x}266.66^\# 21$	0.016 $^\# 8$				
269.79 11	0.070 $^\ddagger 15$	1640.914	1 $^-$	1371.132	1 $^-$
$^{x}334.01^\# 11$	0.094 $^\# 16$				
$^{x}355.57^\# 21$	0.016 $^\# 8$				
$^{x}362.5^\# 3$	0.008 $^\# 8$				
365.21 11	0.062 $^\ddagger 16$	1046.87	5 $^+$	681.66	7 $^+$
380.81 14	0.062 $^\ddagger 16$	2196.119	(1 $^-$,2)	1815.151	1 $^+$
429.27 6	0.16 $^\ddagger 3$	1640.914	1 $^-$	1211.577	0 $^-$
$^{x}439.62^\# 11$	0.055 $^\# 16$				
479.17 9	0.008 $^\ddagger 8$	681.66	7 $^+$	202.493	3 $^-$
$^{x}517.07^\# 13$	0.039 $^\# 8$				
574.10 3	15 3	776.592	2 $^+$	202.493	3 $^-$
$^{x}594.97^\# 15$	0.039 $^\# 8$				
603.37 20	0.030 8	1815.151	1 $^+$	1211.577	0 $^-$
605.00 3	0.57 11	2365.963	1 $^-$	1760.976	2 $^-$
618.58 18	0.020 5	1571.613	2 $^-$, (3 $^-$)	953.512	3 $^+$
628.78 24	0.023 7	3476.06	1,2	2847.42	1 $^-$
630.4 $^\& 3$	0.017 $^\& 6$	3469.13	2,3 $^-$	2838.32	1 $^+$,2
630.4 $^\& 3$	0.017 $^\& 6$	4100.49	1,2 $^-$	3469.13	2,3 $^-$
637.85 12	0.030 7	3476.06	1,2	2838.32	1 $^+$,2
648.87 $^\& 16$	0.022 $^\& 5$	3312.407	2,(1 $^-$)	2663.28	(1,2) $^-$
648.87 $^\& 16$	0.022 $^\& 5$	3692.29	1 $^-$	3043.50	(2,3 $^-$)
$^{x}655.95^\# 18$	0.06 $^\# 2$				
$^{x}658.65^\# 17$	0.055 $^\# 15$				
673.6 3	0.016 5	4835.05	1,2	4161.28	(1,2)
680.39 15	0.023 5	2495.48	(2)	1815.151	1 $^+$
689.45 $^\& 8$	0.049 $^\& 10$	2504.612	2 $^-$	1815.151	1 $^+$
689.45 $^\& 8$	0.049 $^\& 10$	3692.29	1 $^-$	3002.68	(1 $^-$,2)
692.64 $^\& 19$	0.050 $^\& 16$	3685.23	1,2	2992.35	2 $^-$, (1 $^-$)
692.64 $^\& 19$	0.050 $^\& 16$	4267.38	1,2	3574.501	1 $^-$
693.80 17	0.057 16	2504.612	2 $^-$	1811.01	3 $^-$, (2 $^-$)
696.38 7	0.062 13	3555.725	1,2	2859.34	2 $^-$, (3 $^-$)
699.01 14	0.026 6	3685.23	1,2	2986.10	2
705.0 3	0.012 4	2838.32	1 $^+$,2	2133.501	1,2 $^-$
715.5 $^\& 5$	0.008 $^\& 3$	2475.92	2 $^-$	1760.976	2 $^-$

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ^\dagger	$I_\gamma^\ddagger@$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	Comments
715.5& 5	0.008& 3	3574.501	1 ⁻	2859.34	2 ⁻ ,(3 ⁻)			
718.0& 4	0.010& 4	2133.501	1,2 ⁻	1416.579	3 ⁻ ,(2 ⁻)			
718.0& 4	0.010& 4	3555.725	1,2	2838.32	1 ⁺ ,2			
723.03 12	0.037 8	4325.06	1 ⁻ ,2 ⁻	3602.07	1 ⁻			
724.98 7	0.069 14	2365.963	1 ⁻	1640.914	1 ⁻			
^x 730.80# 23	0.016# 8							
743.21& 21	0.016& 5	2504.612	2 ⁻	1760.976	2 ⁻			
743.21& 21	0.016& 5	3602.07	1 ⁻	2859.34	2 ⁻ ,(3 ⁻)			
748.0 3	0.020 6	2992.35	2 ⁻ ,(1 ⁻)	2244.30	1 ⁺ ,2 ⁻			
749.9 3	0.036 11	3469.13	2,3 ⁻	2719.35	(1,2 ⁻)			
751.32 13	0.067 16	953.512	3 ⁺	202.493	3 ⁻			
754.21 16	0.025 7	3602.07	1 ⁻	2847.42	1 ⁻			
756.71 7	0.102 22	3476.06	1,2	2719.35	(1,2 ⁻)			
758.26 23	0.029 9	3002.68	(1 ⁻ ,2)	2244.30	1 ⁺ ,2 ⁻			
762.39 4	0.15 3	2133.501	1,2 ⁻	1371.132	1 ⁻			
776.64 3	56.0 11	776.592	2 ⁺	0.0	2 ⁻	E1+M2	-0.066 9	Mult., δ : from $\gamma\gamma(\theta)$ (1983De27).
^x 786.8# 4	0.047# 15							
789.91 12	0.063 14	2986.10	2	2196.119	(1 ⁻ ,2)			
793.14 10	0.084 19	3953.54	1,2	3160.210	1 ⁻			
794.38 4	0.34 7	2365.963	1 ⁻	1571.613	2 ⁻ ,(3 ⁻)			
^x 813.89# 21	0.031# 8							
816.45 6	0.068 14	3574.501	1 ⁻	2758.076	1 ⁻ ,2 ⁻			
825.15 14	0.025 6	2196.119	(1 ⁻ ,2)	1371.132	1 ⁻			
833.33 21	0.026 7	3692.29	1 ⁻	2859.34	2 ⁻ ,(3 ⁻)			
835.43 20	0.033 9	2475.92	2 ⁻	1640.914	1 ⁻			
837.2& 3	0.020& 7	3312.407	2,(1 ⁻)	2475.92	2 ⁻			
837.2& 3	0.020& 7	3469.13	2,3 ⁻	2631.93	(2,3 ⁻)			
843.69& 19	0.035& 9	3476.06	1,2	2631.93	(2,3 ⁻)			
843.69& 19	0.035& 9	3602.07	1 ⁻	2758.076	1 ⁻ ,2 ⁻			
845.5& 5	0.027& 11	3469.13	2,3 ⁻	2623.99	1 ⁻			
845.5& 5	0.027& 11	3685.23	1,2	2838.32	1 ⁺ ,2			
^x 846.79 5	0.27 6							
855.30 20	0.017 5	3574.501	1 ⁻	2719.35	(1,2 ⁻)			
862.3& 3	0.026& 7	2623.99	1 ⁻	1760.976	2 ⁻			
862.3& 3	0.026& 7	4267.38	1,2	3404.82	2 ⁻ ,(3 ⁻)			
864.28 5	0.26 5	1640.914	1 ⁻	776.592	2 ⁺			
871.01 14	0.027 7	2631.93	(2,3 ⁻)	1760.976	2 ⁻			
^x 873.43 4	0.15 3							
881.5& 5	0.017& 9	3602.07	1 ⁻					
881.5& 5	0.017& 9	4835.05	1,2	3953.54	1,2			
882.8 3	0.019 8	3602.07	1 ⁻	2719.35	(1,2 ⁻)			
890.8 3	0.012 4	3934.47	1 ⁻	3043.50	(2,3 ⁻)			
893.56 12	0.036 8	4037.54	1,2 ⁻	3143.83	2			
895.74 6	0.087 18	4451.574	1,2	3555.725	1,2			
^x 898.68# 15	0.11# 2							
904.7& 4	0.014& 7	2475.92	2 ⁻	1571.613	2 ⁻ ,(3 ⁻)			
904.7& 4	0.014& 7	2719.35	(1,2 ⁻)	1815.151	1 ⁺			
909.26 11	0.029 7	3404.82	2 ⁻ ,(3 ⁻)	2495.48	(2)			
915.78 7	0.053 11	3160.210	1 ⁻	2244.30	1 ⁺ ,2 ⁻			
921.7 4	0.011 4	2133.501	1,2 ⁻	1211.577	0 ⁻			

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
923.66& 42	0.013& 5	2495.48	(2)	1571.613	2 ⁻ ,(3 ⁻)
923.7& 4	0.013& 5	3555.725	1,2	2631.93	(2,3 ⁻)
930.82 17	0.019 5	4533.14	2 ⁻ ,(1 ⁻)	3602.07	1 ⁻
937.75#a 14	0.070# 15	2749.239	2	1811.01	3 ⁻ ,(2 ⁻)
943.24 24	0.044 13	3574.501	1 ⁻	2631.93	(2,3 ⁻)
x944.02# 14	0.086# 23				
948.73 15	0.023 7	3934.47	1 ⁻	2986.10	2
953.54 3	0.97 19	953.512	3 ⁺	0.0	2 ⁻
959.9 3	0.010 5	4515.93	(1,2)	3555.725	1,2
x962.1# 3	0.031# 7				
964.38 6	0.13 3	3627.647	1 ⁻	2663.28	(1,2) ⁻
965.92 12	0.062 14	3685.23	1,2	2719.35	(1,2 ⁻)
970.8 3	0.036 15	3602.07	1 ⁻	2631.93	(2,3 ⁻)
972.1 3	0.040 15	3476.06	1,2	2504.612	2 ⁻
976.2 3	0.016 5	4451.574	1,2	3476.06	1,2
977.96 9	0.059 12	3602.07	1 ⁻	2623.99	1 ⁻
980.95 22	0.021 5	3476.06	1,2	2495.48	(2)
988.37 14	0.049 11	2749.239	2	1760.976	2 ⁻
x990.24# 21	0.062# 16				
994.76 8	0.065 13	2365.963	1 ⁻	1371.132	1 ⁻
997.02 5	0.125 25	2758.076	1 ⁻ ,2 ⁻	1760.976	2 ⁻
x1003.8# 5	0.039# 16				
x1006.9# 7	0.023# 8				
x1020.84# 20	0.070# 16				
1023.07 5	0.116 24	2838.32	1 ⁺ ,2	1815.151	1 ⁺
x1028.5# 3	0.047# 16				
1032.60 6	0.063 13	2244.30	1 ⁺ ,2 ⁻	1211.577	0 ⁻
1038.1#a 5	0.047# 15	1815.151	1 ⁺	776.592	2 ⁺
1039.75 10	0.042 9	4515.93	(1,2)	3476.06	1,2
x1049.3# 10	0.031# 23				
1050.71 10	0.035 7	4210.80	(1,2)	3160.210	1 ⁻
1059.09 15	0.038 9	2475.92	2 ⁻	1416.579	3 ⁻ ,(2 ⁻)
1060.8& 3	0.020& 6	2631.93	(2,3 ⁻)	1571.613	2 ⁻ ,(3 ⁻)
1060.8& 3	0.020& 6	4529.65	0 ⁻ ,1,2	3469.13	2,3 ⁻
x1065.96# 13	0.08# 2				
1069.75 5	0.095 19	3574.501	1 ⁻	2504.612	2 ⁻
1079.02 11	0.029 6	2495.48	(2)	1416.579	3 ⁻ ,(2 ⁻)
x1081.1# 7	0.008# 8				
1086.19#a 22	0.055# 16	2847.42	1 ⁻	1760.976	2 ⁻
1087.94 4	0.19 4	2504.612	2 ⁻	1416.579	3 ⁻ ,(2 ⁻)
1098.1& 3	0.019& 6	2859.34	2 ⁻ ,(3 ⁻)	1760.976	2 ⁻
1098.1& 3	0.019& 6	4100.49	1,2 ⁻	3002.68	(1 ⁻ ,2)
1104.72 13	0.038 8	2475.92	2 ⁻	1371.132	1 ⁻
1107.45 16	0.065 17	4267.38	1,2	3160.210	1 ⁻
1117.06 7	0.047 10	2758.076	1 ⁻ ,2 ⁻	1640.914	1 ⁻
x1122.50# 13	0.039# 8				
1125.04 9	0.039 8	4529.65	0 ⁻ ,1,2	3404.82	2 ⁻ ,(3 ⁻)
1128.87 23	0.014 4	4533.14	2 ⁻ ,(1 ⁻)	3404.82	2 ⁻ ,(3 ⁻)
1132.03 9	0.075 16	3627.647	1 ⁻	2495.48	(2)
1133.62 12	0.054 12	2504.612	2 ⁻	1371.132	1 ⁻
x1140.9# 4	0.039# 16				

Continued on next page (footnotes at end of table)

${}^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma({}^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1143.38 25	0.015 4	4835.05	1,2	3692.29	1 ⁻
1151.54 9	0.049 10	3627.647	1 ⁻	2475.92	2 ⁻
1158.7 3	0.013 5	4161.28	(1,2)	3002.68	(1 ⁻ ,2)
^x 1165.11# 15	0.055# 16				
1168.62 4	0.32 7	1371.132	1 ⁻	202.493	3 ⁻
1170.89 13	0.035 8	2986.10	2	1815.151	1 ⁺
1177.54 6	0.067 14	2749.239	2	1571.613	2 ⁻ ,(3 ⁻)
1181.42& 22	0.015& 5	2992.35	2 ⁻ ,(1 ⁻)	1811.01	3 ⁻ ,(2 ⁻)
1181.42& 22	0.015& 5	4325.06	1 ⁻ ,2 ⁻	3143.83	2
1186.47 4	0.27 5	2758.076	1 ⁻ ,2 ⁻	1571.613	2 ⁻ ,(3 ⁻)
1188.11 31	0.025 8	3002.68	(1 ⁻ ,2)	1815.151	1 ⁺
1190.6& 3	0.015& 5	3555.725	1,2	2365.963	1 ⁻
1190.6& 3	0.015& 5	4037.54	1,2 ⁻	2847.42	1 ⁻
1206.30 12	0.21 7	2847.42	1 ⁻	1640.914	1 ⁻
1208.29 11	0.045 10	4210.80	(1,2)	3002.68	(1 ⁻ ,2)
1211.56 3	3.6 7	1211.577	0 ⁻	0.0	2 ⁻
1214.05 3	0.66 13	1416.579	3 ⁻ ,(2 ⁻)	202.493	3 ⁻
1217.08 8	0.048 10	4529.65	0 ⁻ ,1,2	3312.407	2,(1 ⁻)
^x 1226.02# 13	0.08# 2				
1231.30 8	0.052 11	2992.35	2 ⁻ ,(1 ⁻)	1760.976	2 ⁻
1242.56 4	0.21 4	2196.119	(1 ⁻ ,2)	953.512	3 ⁺
^x 1254.0# 4	0.023# 16				
1264.25 6	0.081 17	2475.92	2 ⁻	1211.577	0 ⁻
1279.31 10	0.059 13	4037.54	1,2 ⁻	2758.076	1 ⁻ ,2 ⁻
1281.32& 10	0.077& 16	4267.38	1,2	2986.10	2
1281.32& 10	0.077& 16	4325.06	1 ⁻ ,2 ⁻	3043.50	(2,3 ⁻)
1288.25 13	0.032 8	4037.54	1,2 ⁻	2749.239	2
1290.83 10	0.056 13	2244.30	1 ⁺ ,2 ⁻	953.512	3 ⁺
1293.07 17	0.028 8	2504.612	2 ⁻	1211.577	0 ⁻
1302.57& 24	0.019& 5	2719.35	(1,2 ⁻)	1416.579	3 ⁻ ,(2 ⁻)
1302.57& 24	0.019& 5	4161.28	(1,2)	2859.34	2 ⁻ ,(3 ⁻)
^x 1309.9# 4	0.016# 8				
^x 1315.5# 4	0.08# 8				
1319.26 13	0.031 7	3685.23	1,2	2365.963	1 ⁻
1321.93& 23	0.027& 7	3953.54	1,2	2631.93	(2,3 ⁻)
1321.93& 23	0.027& 7	4325.06	1 ⁻ ,2 ⁻	3002.68	(1 ⁻ ,2)
1323.9 4	0.015 5	4161.28	(1,2)	2838.32	1 ⁺ ,2
1330.01& 24	0.016& 5	3574.501	1 ⁻	2244.30	1 ⁺ ,2 ⁻
1330.01& 24	0.016& 5	3953.54	1,2	2623.99	1 ⁻
1332.68 3	0.30 6	2749.239	2	1416.579	3 ⁻ ,(2 ⁻)
^x 1336.91# 21	0.039# 8				
1341.0 3	0.027 9	2758.076	1 ⁻ ,2 ⁻	1416.579	3 ⁻ ,(2 ⁻)
1345.28 9	0.055 12	2986.10	2	1640.914	1 ⁻
1347.96 22	0.019 5	2719.35	(1,2 ⁻)	1371.132	1 ⁻
^x 1354.6# 4	0.031# 8				
1356.91 4	0.16 3	2133.501	1,2 ⁻	776.592	2 ⁺
1359.55 4	0.20 4	3555.725	1,2	2196.119	(1 ⁻ ,2)
1369.10 3	0.84 17	1571.613	2 ⁻ ,(3 ⁻)	202.493	3 ⁻
1371.13 3	2.6 5	1371.132	1 ⁻	0.0	2 ⁻
1378.08 3	0.24 5	2749.239	2	1371.132	1 ⁻
1383.16 7	0.050 11	3627.647	1 ⁻	2244.30	1 ⁺ ,2 ⁻

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1386.97 9	0.041 9	2758.076	1 ⁻ ,2 ⁻	1371.132	1 ⁻
1399.24 4	0.115 23	3160.210	1 ⁻	1760.976	2 ⁻
1402.67 11	0.028 6	3043.50	(2,3 ⁻)	1640.914	1 ⁻
^x 1404.1# 3	0.031# 8				
^x 1408.25# 18	0.047# 16				
1416.55 3	1.4 3	1416.579	3 ⁻ ,(2 ⁻)	0.0	2 ⁻
1419.48 4	0.095 19	2196.119	(1 ⁻ ,2)	776.592	2 ⁺
1422.33 5	0.057 12	3555.725	1,2	2133.501	1,2 ⁻
1428.79 23	0.018 5	4267.38	1,2	2838.32	1 ⁺ ,2
1430.59& 19	0.021& 5	3002.68	(1 ⁻ ,2)	1571.613	2 ⁻ ,(3 ⁻)
1430.59& 19	0.021& 5	4835.05	1,2	3404.82	2 ⁻ ,(3 ⁻)
1438.97 11	0.043 9	3934.47	1 ⁻	2495.48	(2)
1441.10& 20	0.023& 6	3574.501	1 ⁻	2133.501	1,2 ⁻
1441.10& 20	0.023& 6	3685.23	1,2	2244.30	1 ⁺ ,2 ⁻
^x 1446.13# 17	0.070# 16				
1448.88 4	0.124 25	4451.574	1,2	3002.68	(1 ⁻ ,2)
1452.05 21	0.022 5	2663.28	(1,2) ⁻	1211.577	0 ⁻
1461.96 20	0.016 4	4210.80	(1,2)	2749.239	2
^x 1466.44 7	0.17 4				
1467.63 7	0.19 4	2244.30	1 ⁺ ,2 ⁻	776.592	2 ⁺
1471.88 11	0.030 7	3043.50	(2,3 ⁻)	1571.613	2 ⁻ ,(3 ⁻)
1476.24 9	0.040 8	4100.49	1,2 ⁻	2623.99	1 ⁻
^x 1481.50# 16	0.12# 2				
1488.92 8	0.041 9	3685.23	1,2	2196.119	(1 ⁻ ,2)
1494.48 20	0.018 5	3627.647	1 ⁻	2133.501	1,2 ⁻
1497.25 6	0.076 15	3312.407	2,(1 ⁻)	1815.151	1 ⁺
^x 1501.32# 16	0.08# 2				
1507.7 2	0.08 3	2719.35	(1,2) ⁻	1211.577	0 ⁻
^x 1508.7 5	0.03 3				
^x 1515.7# 8	0.031# 16				
1519.31 4	0.16 3	3160.210	1 ⁻	1640.914	1 ⁻
1533.21 15	0.025 6	4037.54	1,2 ⁻	2504.612	2 ⁻
1542.3 3	0.037 16	2495.48	(2)	953.512	3 ⁺
1543.60 12	0.11 3	4529.65	0 ⁻ ,1,2	2986.10	2
1546.51 5	0.19 4	2758.076	1 ⁻ ,2 ⁻	1211.577	0 ⁻
1551.18& 10	0.055& 12	2504.612	2 ⁻	953.512	3 ⁺
1551.18& 10	0.055& 12	3312.407	2,(1 ⁻)	1760.976	2 ⁻
1558.45 3	1.13 23	1760.976	2 ⁻	202.493	3 ⁻
1561.76 9	0.044 10	4037.54	1,2 ⁻	2475.92	2 ⁻
1568.45 5	0.106 22	3934.47	1 ⁻	2365.963	1 ⁻
1571.62 3	1.04 21	1571.613	2 ⁻ ,(3 ⁻)	0.0	2 ⁻
1587.6& 4	0.019& 9	3953.54	1,2	2365.963	1 ⁻
1587.6& 4	0.019& 9	4210.80	(1,2)	2623.99	1 ⁻
^x 1603.2# 6	0.031# 16				
1604.86 9	0.051 11	4100.49	1,2 ⁻	2495.48	(2)
^x 1606.3# 5	0.055# 16				
1608.52 9	0.22 6	1811.01	3 ⁻ ,(2 ⁻)	202.493	3 ⁻
^x 1609.47 11	0.18 5				
1615.04 9	0.038 8	2986.10	2	1371.132	1 ⁻
1624.33 19	0.058 14	4100.49	1,2 ⁻	2475.92	2 ⁻
1626.82 12	0.050 11	3043.50	(2,3 ⁻)	1416.579	3 ⁻ ,(2 ⁻)
^x 1629.63# 21	0.14# 3				

Continued on next page (footnotes at end of table)

${}^{89}\text{Y}(\text{n},\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma({}^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1635.32# ^a 19	0.13# 3	2847.42	1 ⁻	1211.577	0 ⁻
1640.93 3	1.14 23	1640.914	1 ⁻	0.0	2 ⁻
1643.46 6	0.083 17	4267.38	1,2	2623.99	1 ⁻
1648.01 18	0.018 5	2859.34	2 ⁻ , (3 ⁻)	1211.577	0 ⁻
^x 1663.36# 19	0.094# 23				
1671.41 & 22	0.021 & 5	3312.407	2, (1 ⁻)	1640.914	1 ⁻
1671.41 & 22	0.021 & 5	4037.54	1,2 ⁻	2365.963	1 ⁻
1673.66 10	0.049 10	4533.14	2 ⁻ , (1 ⁻)	2859.34	2 ⁻ , (3 ⁻)
^x 1681.37# 18	0.11# 2				
^x 1686.44# 18	0.10# 2				
1691.6 & 3	0.012 & 4	4529.65	0 ⁻ , 1,2	2838.32	1 ⁺ , 2
1691.6 & 3	0.012 & 4	4835.05	1,2	3143.83	2
^x 1696.5# 20	0.05# 4				
^x 1706.21# 14	0.12# 2				
^x 1712.2# 3	0.062# 16				
^x 1717.62# 23	0.055# 16				
^x 1724.7# 9	0.05# 2				
1727.22 4	0.34 7	3143.83	2	1416.579	3 ⁻ , (2 ⁻)
1732.24 11	0.098 22	4451.574	1,2	2719.35	(1,2 ⁻)
^x 1733.99 7	0.16 3				
1744.58 11	0.035 8	3555.725	1,2	1811.01	3 ⁻ , (2 ⁻)
^x 1747.97# 17	0.10# 2				
^x 1754.59# 15	0.12# 2				
1757.25 9	0.046 10	3953.54	1,2	2196.119	(1 ⁻ , 2)
1760.92 4	0.55 11	1760.976	2 ⁻	0.0	2 ⁻
^x 1767.0# 3	0.055# 16				
1772.08 12	0.15 3	4267.38	1,2	2495.48	(2)
^x 1773.89 6	0.48 10				
^x 1775.83 6	0.31 6				
1780.61# ^a 11	0.45# 9	2992.35	2 ⁻ , (1 ⁻)	1211.577	0 ⁻
1790.24# ^a 22	0.094# 23	3602.07	1 ⁻	1811.01	3 ⁻ , (2 ⁻)
1795.08 & 25	0.034 & 11	3555.725	1,2	1760.976	2 ⁻
1795.08 & 25	0.034 & 11	4161.28	(1,2)	2365.963	1 ⁻
1796.66 13	0.070 16	4515.93	(1,2)	2719.35	(1,2 ⁻)
^x 1800.84# 18	0.11# 2				
1810.82 9	0.24 5	1811.01	3 ⁻ , (2 ⁻)	0.0	2 ⁻
1812.35 11	0.12 3	3627.647	1 ⁻	1815.151	1 ⁺
1815.02 4	1.7 3	1815.151	1 ⁺	0.0	2 ⁻
1829.0 3	0.013 4	4325.06	1 ⁻ , 2 ⁻	2495.48	(2)
1835.4# ^a 5	0.12# 4	3476.06	1,2	1640.914	1 ⁻
1842.0 & 3	0.011 & 3	4037.54	1,2 ⁻	2196.119	(1 ⁻ , 2)
1842.0 & 3	0.011 & 3	4835.05	1,2	2992.35	2 ⁻ , (1 ⁻)
1847.99 21	0.016 4	2623.99	1 ⁻	776.592	2 ⁺
^x 1852.17 4	0.22 4				
1855.07 18	0.031 7	2631.93	(2,3 ⁻)	776.592	2 ⁺
^x 1859.2# 17	0.016# 16				
1867.01 18	0.022 5	3627.647	1 ⁻	1760.976	2 ⁻
1869.98 & 10	0.045 & 9	3685.23	1,2	1815.151	1 ⁺
1869.98 & 10	0.045 & 9	4533.14	2 ⁻ , (1 ⁻)	2663.28	(1,2) ⁻

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1884.78 5	0.15 3	2838.32	1 ⁺ ,2	953.512	3 ⁺
^x 1889.25 [#] 22	0.086 [#] 23				
^x 1894.1 [#] 4	0.08 [#] 4				
1895.81 4	0.42 8	3312.407	2,(1 ⁻)	1416.579	3 ⁻ ,(2 ⁻)
^x 1902.7 [#] 3	0.055 [#] 16				
1904.9 ^{#a} 5	0.031 [#] 16	2859.34	2 ⁻ ,(3 ⁻)	953.512	3 ⁺
1914.76 5	0.14 3	3555.725	1,2	1640.914	1 ⁻
1933.47 5	0.16 3	3574.501	1 ⁻	1640.914	1 ⁻
^x 1936.5 [#] 4	0.094 [#] 23				
^x 1940.0 [#] 7	0.047 [#] 16				
1942.73 5	0.15 3	2719.35	(1,2 ⁻)	776.592	2 ⁺
^x 1947.53 [#] 21	0.094 [#] 2				
^x 1951.4 [#] 3	0.062 [#] 23				
1961.9 3	0.025 6	3602.07	1 ⁻	1640.914	1 ⁻
1964.7 ^{#a} 6	0.062 [#] 23	4161.28	(1,2)	2196.119	(1 ⁻ ,2)
1966.84 & 16	0.041 & 9	4100.49	1,2 ⁻	2133.501	1,2 ⁻
1966.84 & 16	0.041 & 9	4210.80	(1,2)	2244.30	1 ⁺ ,2 ⁻
1972.3 ^{#a} 3	0.11 [#] 3	2749.239	2	776.592	2 ⁺
^x 1974.61 5	0.19 4				
^x 1982.8 [#] 5	0.023 [#] 8				
1986.6 4	0.021 6	3627.647	1 ⁻	1640.914	1 ⁻
1988.53 13	0.057 12	3404.82	2 ⁻ ,(3 ⁻)	1416.579	3 ⁻ ,(2 ⁻)
1993.47 ^{#a} 19	0.11 [#] 2	2196.119	(1 ⁻ ,2)	202.493	3 ⁻
^x 1999.8 [#] 7	0.039 [#] 16				
2002.98 6	0.084 9	3574.501	1 ⁻	1571.613	2 ⁻ ,(3 ⁻)
^x 2011.7 [#] 5	0.031 [#] 8				
^x 2014.6 [#] 10	0.016 [#] 8				
2021.84 5	0.248 25	6856.992	1 ⁻	4835.05	1,2
^x 2022.2 [#] 3	0.18 [#] 5				
2030.5 ^{#a} 5	0.10 [#] 4	3602.07	1 ⁻	1571.613	2 ⁻ ,(3 ⁻)
2032.34 10	0.123 13	2986.10	2	953.512	3 ⁺
2034.7 3	0.053 8	4529.65	0 ⁻ ,1,2	2495.48	(2)
2043.7 3	0.023 4	3685.23	1,2	1640.914	1 ⁻
^x 2047.2 [#] 3	0.031 [#] 16				
2049.31 10	0.055 6	3002.68	(1 ⁻ ,2)	953.512	3 ⁺
2057.9 4	0.013 4	4533.14	2 ⁻ ,(1 ⁻)	2475.92	2 ⁻
^x 2065.23 [#] 21	0.094 [#] 23				
2070.94 18	0.058 11	2847.42	1 ⁻	776.592	2 ⁺
2077.06 11	0.062 8	4210.80	(1,2)	2133.501	1,2 ⁻
2086.01 20	0.021 4	4451.574	1,2	2365.963	1 ⁻
2090.6 4	0.022 8	3043.50	(2,3 ⁻)	953.512	3 ⁺
^x 2094.5 [#] 5	0.055 [#] 16				
2104.87 5	0.28 3	3476.06	1,2	1371.132	1 ⁻
2129.32 23	0.019 4	4325.06	1 ⁻ ,2 ⁻	2196.119	(1 ⁻ ,2)
2133.30 17	0.033 5	2133.501	1,2 ⁻	0.0	2 ⁻
^x 2136.19 7	0.26 3				
2138.97 6	0.59 6	3555.725	1,2	1416.579	3 ⁻ ,(2 ⁻)
2142.55 8	0.069 8	3953.54	1,2	1811.01	3 ⁻ ,(2 ⁻)
^x 2153.01 [#] 19	0.16 [#] 4				
^x 2156.86 [#] 22	0.12 [#] 3				

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
2163.35 12	0.075 9	2365.963	1 ⁻	202.493	3 ⁻
^x 2166.0# 5	0.10# 4				
2184.65 5	0.30 3	3555.725	1,2	1371.132	1 ⁻
2190.33 5	0.201 20	3143.83	2	953.512	3 ⁺
2196.00 5	0.60 6	2196.119	(1 ⁻ ,2)	0.0	2 ⁻
2203.14 8	0.067 7	4835.05	1,2	2631.93	(2,3 ⁻)
^x 2208.88 7	0.26 3				
^x 2216.42 8	0.159 18				
^x 2220.7# 3	0.22# 5				
^x 2227.86 6	0.28 3				
2230.88 7	0.105 11	3602.07	1 ⁻	1371.132	1 ⁻
2244.28 6	0.40 4	2244.30	1 ⁺ ,2 ⁻	0.0	2 ⁻
2256.51 6	0.232 23	3627.647	1 ⁻	1371.132	1 ⁻
2264.53 7	0.217 23	3476.06	1,2	1211.577	0 ⁻
2268.81 14	0.023 3	3685.23	1,2	1416.579	3 ⁻ ,(2 ⁻)
^x 2270.1# 10	0.02# 2				
2273.39 6	0.76 8	2475.92	2 ⁻	202.493	3 ⁻
2285.37& 8	0.108& 11	4100.49	1,2 ⁻	1815.151	1 ⁺
2285.37& 8	0.108& 11	4529.65	0 ⁻ ,1,2	2244.30	1 ⁺ ,2 ⁻
2292.87 6	0.154 16	2495.48	(2)	202.493	3 ⁻
2302.05 6	0.28 3	2504.612	2 ⁻	202.493	3 ⁻
2312.65 13	0.033 5	3953.54	1,2	1640.914	1 ⁻
2314.57 23	0.017 4	3685.23	1,2	1371.132	1 ⁻
2320.97 7	0.146 15	3692.29	1 ⁻	1371.132	1 ⁻
2323.83 6	0.221 22	6856.992	1 ⁻	4533.14	2 ⁻ ,(1 ⁻)
2327.37 5	0.66 7	6856.992	1 ⁻	4529.65	0 ⁻ ,1,2
2336.64 18	0.028 5	4533.14	2 ⁻ ,(1 ⁻)	2196.119	(1 ⁻ ,2)
2341.05 5	0.34 3	6856.992	1 ⁻	4515.93	(1,2)
2345.94 10	0.051 6	4161.28	(1,2)	1815.151	1 ⁺
2362.93 5	0.38 4	3574.501	1 ⁻	1211.577	0 ⁻
2365.92 6	0.109 11	2365.963	1 ⁻	0.0	2 ⁻
^x 2374.4# 5	0.07# 3				
2381.9& 3	0.012& 3	3953.54	1,2	1571.613	2 ⁻ ,(3 ⁻)
2381.9& 3	0.012& 3	4515.93	(1,2)	2133.501	1,2 ⁻
^x 2386.97 5	0.158 16				
2396.70 7	0.060 6	4037.54	1,2 ⁻	1640.914	1 ⁻
2399.66& 6	0.080& 8	4210.80	(1,2)	1811.01	3 ⁻ ,(2 ⁻)
2399.66& 6	0.080& 8	4533.14	2 ⁻ ,(1 ⁻)	2133.501	1,2 ⁻
2405.39 5	0.61 6	6856.992	1 ⁻	4451.574	1,2
2416.11 6	0.063 7	3627.647	1 ⁻	1211.577	0 ⁻
^x 2423.09# 22	0.12# 3				
2429.48 5	0.155 16	2631.93	(2,3 ⁻)	202.493	3 ⁻
^x 2433.6# 6	0.023# 16				
^x 2443.8# 3	0.12# 3				
2452.34 24	0.015 3	4267.38	1,2	1815.151	1 ⁺
2459.92 20	0.049 15	4100.49	1,2 ⁻	1640.914	1 ⁻
2461.06 17	0.059 15	2663.28	(1,2) ⁻	202.493	3 ⁻
2465.64 19	0.012 2	4037.54	1,2 ⁻	1571.613	2 ⁻ ,(3 ⁻)
2469.53 24	0.012 2	4835.05	1,2	2365.963	1 ⁻
2473.97 16	0.176 20	3685.23	1,2	1211.577	0 ⁻
2475.98 8	0.175 19	2475.92	2 ⁻	0.0	2 ⁻
^x 2478.1# 6	0.19# 5				

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ^\dagger	$I_\gamma^\dagger@$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
2495.38 5	0.104 11	2495.48	(2)	0.0	2 ⁻
2504.61 5	1.26 13	2504.612	2 ⁻	0.0	2 ⁻
2509.98 11	0.026 3	4325.06	1 ⁻ ,2 ⁻	1815.151	1 ⁺
2515.60 5	0.144 15	3469.13	2,3 ⁻	953.512	3 ⁺
2520.15 8	0.077 8	4161.28	(1,2)	1640.914	1 ⁻
2531.86 7	0.097 10	6856.992	1 ⁻	4325.06	1 ⁻ ,2 ⁻
2546.71 5	2.16 22	2749.239	2	202.493	3 ⁻
^x 2552.8 [#] 6	0.070 [#] 23				
2555.62 5	0.149 15	2758.076	1 ⁻ ,2 ⁻	202.493	3 ⁻
2563.81 19	0.035 7	3934.47	1 ⁻	1371.132	1 ⁻
^x 2565.73 6	0.36 4				
^x 2583.84 5	0.220 23				
2589.68 5	0.76 8	6856.992	1 ⁻	4267.38	1,2
^x 2617.5 [#] 5	0.047 [#] 16				
2623.95 5	0.33 3	2623.99	1 ⁻	0.0	2 ⁻
2628.37 20	0.020 4	3404.82	2 ⁻ , (3 ⁻)	776.592	2 ⁺
2636.33 5	0.117 12	4451.574	1,2	1815.151	1 ⁺
2639.07 14	0.023 3	4210.80	(1,2)	1571.613	2 ⁻ , (3 ⁻)
2646.19 5	0.40 4	6856.992	1 ⁻	4210.80	(1,2)
2648.56 6	0.116 12	3602.07	1 ⁻	953.512	3 ⁺
2656.75 5	0.117 12	2859.34	2 ⁻ , (3 ⁻)	202.493	3 ⁻
2663.27 5	0.185 19	2663.28	(1,2) ⁻	0.0	2 ⁻
^x 2674.6 [#] 4	0.086 [#] 23				
2690.64 22	0.010 2	4451.574	1,2	1760.976	2 ⁻
2695.64 5	0.39 4	6856.992	1 ⁻	4161.28	(1,2)
2699.45 15	0.038 6	3476.06	1,2	776.592	2 ⁺
2701.23 10	0.061 8	4835.05	1,2	2133.501	1,2 ⁻
^x 2710.3 [#] 4	0.078 [#] 23				
2719.29 8	0.037 4	2719.35	(1,2 ⁻)	0.0	2 ⁻
2722.72 6	0.070 7	3934.47	1 ⁻	1211.577	0 ⁻
^x 2726.98 5	0.208 21				
2731.9 3	0.016 4	3685.23	1,2	953.512	3 ⁺
2742.35 21	0.012 3	3953.54	1,2	1211.577	0 ⁻
2749.24 5	2.44 24	2749.239	2	0.0	2 ⁻
2756.46 5	0.61 6	6856.992	1 ⁻	4100.49	1,2 ⁻
2758.04 6	0.32 3	2758.076	1 ⁻ ,2 ⁻	0.0	2 ⁻
2779.15 8	0.039 4	3555.725	1,2	776.592	2 ⁺
2783.74 10	0.062 8	2986.10	2	202.493	3 ⁻
2789.93 7	0.116 12	2992.35	2 ⁻ , (1 ⁻)	202.493	3 ⁻
2797.95 12	0.030 4	3574.501	1 ⁻	776.592	2 ⁺
2800.24 12	0.032 4	3002.68	(1 ⁻ ,2)	202.493	3 ⁻
2810.75 7	0.043 5	4451.574	1,2	1640.914	1 ⁻
2819.56 7	0.53 5	6856.992	1 ⁻	4037.54	1,2 ⁻
2825.90 6	0.082 8	4037.54	1,2 ⁻	1211.577	0 ⁻
^x 2831.83 5	0.36 4				
2838.42 5	0.179 18	2838.32	1 ⁺ ,2	0.0	2 ⁻
2840.95 6	0.083 9	3043.50	(2,3 ⁻)	202.493	3 ⁻
2847.39 5	0.53 5	2847.42	1 ⁻	0.0	2 ⁻
2859.36 5	0.104 11	2859.34	2 ⁻ , (3 ⁻)	0.0	2 ⁻
2875.08 6	0.087 9	4515.93	(1,2)	1640.914	1 ⁻
^x 2881.2 [#] 6	0.039 [#] 16				
^x 2885.06 5	0.31 3				
2889.06 7	0.155 16	4100.49	1,2 ⁻	1211.577	0 ⁻
2896.05 15	0.015 2	4267.38	1,2	1371.132	1 ⁻

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ †	I_γ †@	$E_i(\text{level})$	J_i^π	E_f	J_f^π
2903.45 5	0.32 3	6856.992	1 ⁻	3953.54	1,2
2908.80 9	0.036 4	3685.23	1,2	776.592	2 ⁺
2915.76 5	0.162 16	3692.29	1 ⁻	776.592	2 ⁺
2922.47 5	0.50 5	6856.992	1 ⁻	3934.47	1 ⁻
^x 2931.0# 8	0.031# 16				
^x 2935.5# 3	0.13# 3				
2941.30 5	0.179 18	3143.83	2	202.493	3 ⁻
2944.42 9	0.044 5	4515.93	(1,2)	1571.613	2 ⁻ ,(3 ⁻)
^x 2949.09# 24	0.14# 3				
^x 2954.7# 12	0.031# 16				
^x 2962.7# 9	0.031# 16				
^x 2965.3# 15	0.02# 2				
^x 2969.5# 5	0.039# 16				
^x 2975.8# 6	0.039# 8				
^x 2981.68# 16	0.18# 4				
2986.18 9	0.102 14	2986.10	2	0.0	2 ⁻
2992.13 9	0.027 3	2992.35	2 ⁻ ,(1 ⁻)	0.0	2 ⁻
^x 3000.5# 6	0.055# 23				
3002.47 10	0.068 4	3002.68	(1 ⁻ ,2)	0.0	2 ⁻
^x 3005.5# 9	0.039# 16				
^x 3020.8# 13	0.023# 16				
^x 3025.11 7	0.180 9				
3043.42 7	0.058 3	3043.50	(2,3 ⁻)	0.0	2 ⁻
^x 3050.6# 4	0.047# 16				
^x 3056.7# 4	0.055# 16				
^x 3062.0# 3	0.055# 16				
^x 3067.6# 5	0.031# 8				
3073.84 17	0.013 1	4835.05	1,2	1760.976	2 ⁻
^x 3089.8# 3	0.11# 3				
^x 3098.88 6	0.387 19				
3109.87 6	0.137 7	3312.407	2,(1 ⁻)	202.493	3 ⁻
3143.0 3	0.018 5	3143.83	2	0.0	2 ⁻
3144.59 10	0.075 6	4515.93	(1,2)	1371.132	1 ⁻
3160.18 6	0.60 3	3160.210	1 ⁻	0.0	2 ⁻
3164.59 6	0.66 3	6856.992	1 ⁻	3692.29	1 ⁻
3171.75 6	0.413 21	6856.992	1 ⁻	3685.23	1,2
^x 3181.34 6	0.180 9				
^x 3190.69 6	0.230 12				
3193.96 10	0.031 2	4835.05	1,2	1640.914	1 ⁻
3202.55 10	0.026 2	3404.82	2 ⁻ ,(3 ⁻)	202.493	3 ⁻
^x 3212.20 6	0.274 14				
3229.25 6	0.64 3	6856.992	1 ⁻	3627.647	1 ⁻
3239.67 16	0.014 2	4451.574	1,2	1211.577	0 ⁻
^x 3250.8# 13	0.023# 16				
3254.87 6	0.66 3	6856.992	1 ⁻	3602.07	1 ⁻
3260.94 8	0.091 5	4037.54	1,2 ⁻	776.592	2 ⁺
3263.29 20	0.025 3	4835.05	1,2	1571.613	2 ⁻ ,(3 ⁻)
3266.30 11	0.039 3	3469.13	2,3 ⁻	202.493	3 ⁻
3282.48 6	1.06 5	6856.992	1 ⁻	3574.501	1 ⁻
^x 3296.8# 5	0.078# 23				
3301.30 6	1.53 8	6856.992	1 ⁻	3555.725	1,2

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ^\dagger	$I_\gamma^\dagger@$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
3312.36 8	0.046 3	3312.407	2,(1 ⁻)	0.0	2 ⁻
3324.30 22	0.036 8	4100.49	1,2 ⁻	776.592	2 ⁺
3353.07 8	0.048 3	3555.725	1,2	202.493	3 ⁻
^x 3362.0 [#] 7	0.055 [#] 23				
^x 3377.5 [#] 5	0.070 [#] 23				
3380.94 6	0.88 4	6856.992	1 ⁻	3476.06	1,2
3387.77 7	0.094 5	6856.992	1 ⁻	3469.13	2,3 ⁻
^x 3391.5 [#] 8	0.031 [#] 8				
3399.55 9	0.085 6	3602.07	1 ⁻	202.493	3 ⁻
3404.62 24	0.036 5	3404.82	2 ⁻ , (3 ⁻)	0.0	2 ⁻
^x 3437.9 [#] 4	0.070 [#] 16				
^x 3444.1 [#] 4	0.078 [#] 23				
3452.07 8	0.122 6	6856.992	1 ⁻	3404.82	2 ⁻ , (3 ⁻)
3469.24 15	0.014 1	3469.13	2,3 ⁻	0.0	2 ⁻
3475.96 7	0.130 7	3476.06	1,2	0.0	2 ⁻
^x 3481.1 [#] 4	0.055 [#] 16				
3490.64 10	0.024 2	4267.38	1,2	776.592	2 ⁺
3498.02 8	0.169 11	4451.574	1,2	953.512	3 ⁺
^x 3514.65 7	0.158 8				
3544.55 7	0.90 5	6856.992	1 ⁻	3312.407	2,(1 ⁻)
3555.61 7	0.338 17	3555.725	1,2	0.0	2 ⁻
3574.55 8	0.058 3	3574.501	1 ⁻	0.0	2 ⁻
3579.54 10	0.027 2	4533.14	2 ⁻ , (1 ⁻)	953.512	3 ⁺
3602.03 7	0.225 12	3602.07	1 ⁻	0.0	2 ⁻
3623.14 12	0.018 1	4835.05	1,2	1211.577	0 ⁻
3627.71 8	0.061 3	3627.647	1 ⁻	0.0	2 ⁻
3674.98 11	0.034 2	4451.574	1,2	776.592	2 ⁺
3692.19 7	0.028 2	3692.29	1 ⁻	0.0	2 ⁻
3696.73 7	0.76 4	6856.992	1 ⁻	3160.210	1 ⁻
^x 3704.2 [#] 9	0.078 [#] 23				
3713.07 7	0.432 22	6856.992	1 ⁻	3143.83	2
3731.98 8	0.042 2	3934.47	1 ⁻	202.493	3 ⁻
3751.03 14	0.014 1	3953.54	1,2	202.493	3 ⁻
3813.53 8	0.076 4	6856.992	1 ⁻	3043.50	(2,3 ⁻)
^x 3823.2 [#] 6	0.031 [#] 8				
^x 3834.1 [#] 5	0.031 [#] 16				
^x 3838.4 [#] 10	0.016 [#] 8				
3854.38 13	0.040 4	6856.992	1 ⁻	3002.68	(1 ⁻ , 2)
3864.60 8	0.063 3	6856.992	1 ⁻	2992.35	2 ⁻ , (1 ⁻)
3870.84 7	0.495 25	6856.992	1 ⁻	2986.10	2
3882.9 8	0.004 2	4835.05	1,2	953.512	3 ⁺
3934.41 8	0.089 5	3934.47	1 ⁻	0.0	2 ⁻
^x 3945.2 [#] 4	0.12 [#] 3				
3953.55 9	0.035 2	3953.54	1,2	0.0	2 ⁻
^x 3973.8 [#] 7	0.016 [#] 8				
3997.40 11	0.062 3	6856.992	1 ⁻	2859.34	2 ⁻ , (3 ⁻)
^x 4005.3 [#] 5	0.062 [#] 16				
4009.56 9	0.50 3	6856.992	1 ⁻	2847.42	1 ⁻
4018.68 8	0.265 13	6856.992	1 ⁻	2838.32	1 ⁺ , 2
4058.39 9	0.038 2	4835.05	1,2	776.592	2 ⁺
^x 4069.8 [#] 6	0.070 [#] 23				
^x 4088.9 [#] 13	0.05 [#] 3				

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ **1993Mi04** (continued) $\gamma(^{90}\text{Y})$ (continued)

E_γ^\dagger	$I_\gamma^\ddagger@$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
4098.92 8	0.60 3	6856.992	1 ⁻	2758.076	1 ⁻ ,2 ⁻
^x 4100.75 10	0.205 15				
4107.74 8	4.69 23	6856.992	1 ⁻	2749.239	2
4122.69 17	0.017 1	4325.06	1 ⁻ ,2 ⁻	202.493	3 ⁻
4137.35 9	0.117 6	6856.992	1 ⁻	2719.35	(1,2 ⁻)
4161.30 10	0.147 7	4161.28	(1,2)	0.0	2 ⁻
^x 4175.2 [#] 16	0.031 [#] 16				
^x 4178.8 [#] 18	0.031 [#] 16				
4193.73 8	0.135 7	6856.992	1 ⁻	2663.28	(1,2) ⁻
^x 4201.4 [#] 15	0.016 [#] 8				
4210.79 9	0.084 4	4210.80	(1,2)	0.0	2 ⁻
4225.11 11	0.023 1	6856.992	1 ⁻	2631.93	(2,3 ⁻)
4233.17 18	0.022 2	6856.992	1 ⁻	2623.99	1 ⁻
4267.35 8	0.242 12	4267.38	1,2	0.0	2 ⁻
^x 4301.4 [#] 5	0.055 [#] 16				
^x 4306.0 [#] 6	0.047 [#] 16				
4313.17 11	0.025 1	4515.93	(1,2)	202.493	3 ⁻
4352.27 8	1.15 6	6856.992	1 ⁻	2504.612	2 ⁻
4361.16 12	0.031 2	6856.992	1 ⁻	2495.48	(2)
^x 4379.4 [#] 4	0.12 [#] 4				
4380.90 9	0.471 24	6856.992	1 ⁻	2475.92	2 ⁻
^x 4426.47 9	0.152 8				
^x 4451.2 [#] 6	0.031 [#] 8				
4490.90 9	0.52 3	6856.992	1 ⁻	2365.963	1 ⁻
4529.48 10	0.051 3	4529.65	0 ⁻ ,1,2	0.0	2 ⁻
4532.91 9	0.167 9	4533.14	2 ⁻ ,(1 ⁻)	0.0	2 ⁻
4612.60 9	0.209 11	6856.992	1 ⁻	2244.30	1 ⁺ ,2 ⁻
^x 4630.3 [#] 4	0.039 [#] 16				
^x 4648.6 [#] 4	0.047 [#] 16				
4660.68 9	0.484 24	6856.992	1 ⁻	2196.119	(1 ⁻ ,2)
^x 4719.9 [#] 10	0.047 [#] 23				
4723.38 12	0.052 3	6856.992	1 ⁻	2133.501	1,2 ⁻
4834.84 17	0.025 2	4835.05	1,2	0.0	2 ⁻
5041.62 10	0.311 16	6856.992	1 ⁻	1815.151	1 ⁺
5095.74 10	0.319 16	6856.992	1 ⁻	1760.976	2 ⁻
5215.74 20	0.017 2	6856.992	1 ⁻	1640.914	1 ⁻
^x 5248.7 [#] 4	0.039 [#] 16				
^x 5269.9 [#] 6	0.031 [#] 8				
5285.08 11	0.160 8	6856.992	1 ⁻	1571.613	2 ⁻ ,(3 ⁻)
5485.56 12	0.233 12	6856.992	1 ⁻	1371.132	1 ⁻
5645.15 13	1.67 8	6856.992	1 ⁻	1211.577	0 ⁻
6080.05 14	63 3	6856.992	1 ⁻	776.592	2 ⁺
^x 6620.9 [#] 7	0.008 [#] 8				
6654.07 21	0.198 10	6856.992	1 ⁻	202.493	3 ⁻
6856.55 3	0.155 8	6856.992	1 ⁻	0.0	2 ⁻

[†] From 1993Mi04, unless otherwise specified.

[‡] From 1983De27.

[#] Reported by 1983De27 only.

[@] Intensity per 100 neutron captures.

Continued on next page (footnotes at end of table)

$^{89}\text{Y}(\text{n},\gamma)$ E=thermal **1993Mi04** (continued)

$\gamma(^{90}\text{Y})$ (continued)

& Multiply placed with undivided intensity.

^a Placement of transition in the level scheme is uncertain.

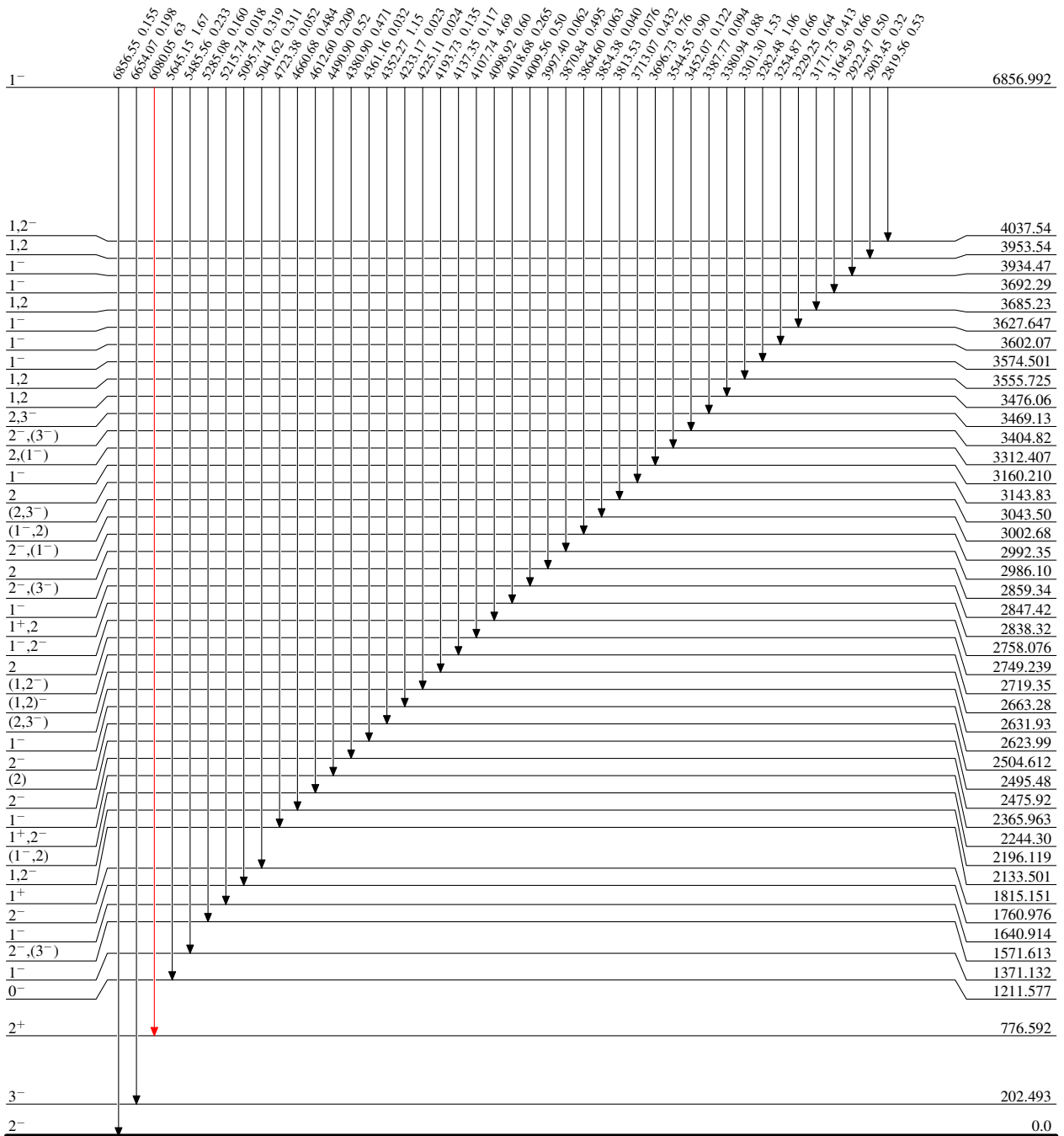
^x γ ray not placed in level scheme.

$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ 1993Mi04

Legend

Level Scheme
Intensities: I_γ per 100 neutron captures

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$



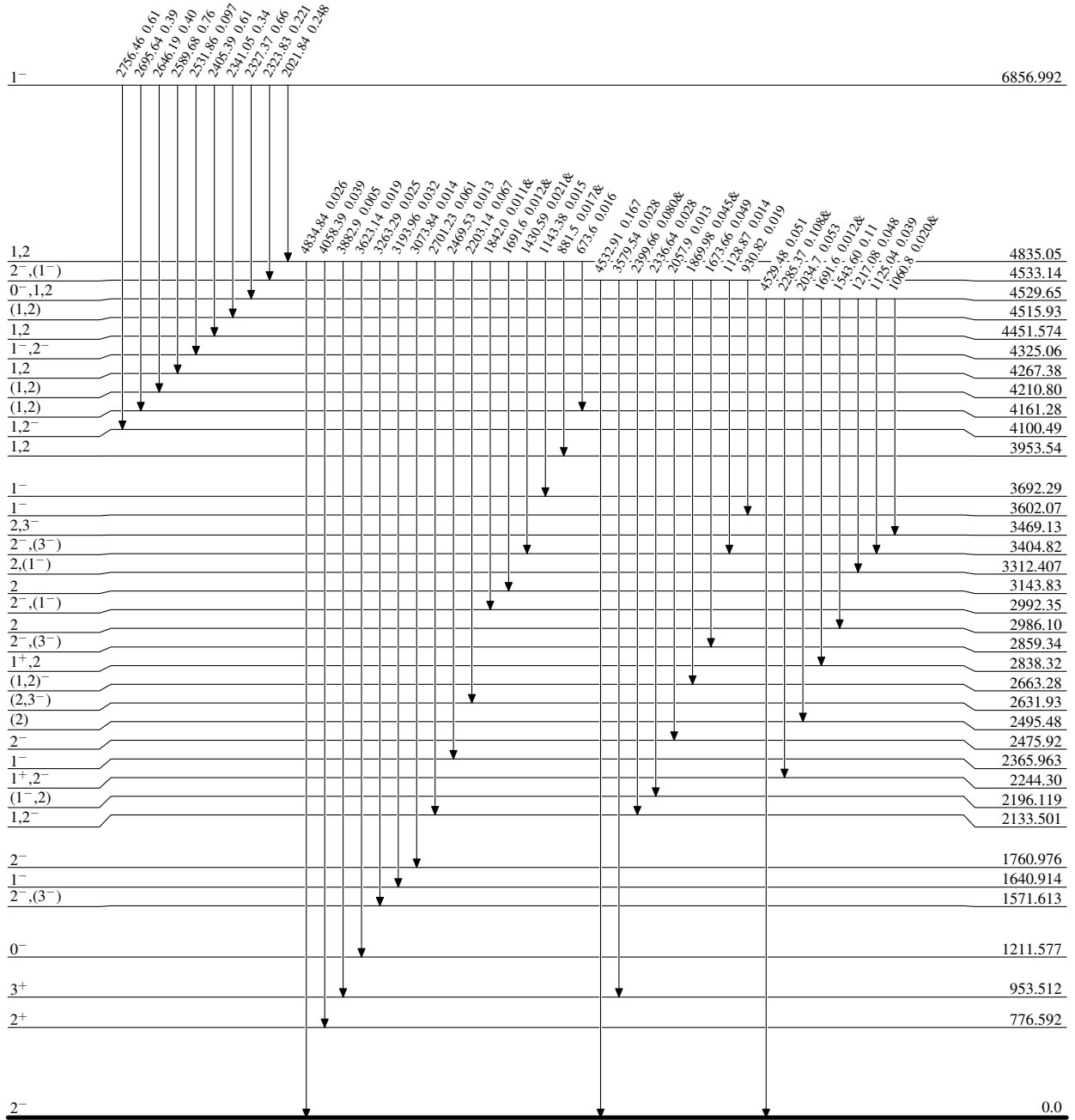
⁸⁹Y(n,γ) E=thermal 1993Mi04

Level Scheme (continued)

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

Legend

- I_γ < 2% × I_γ^{max}
- I_γ < 10% × I_γ^{max}
- I_γ > 10% × I_γ^{max}



⁹⁰Y₅₁

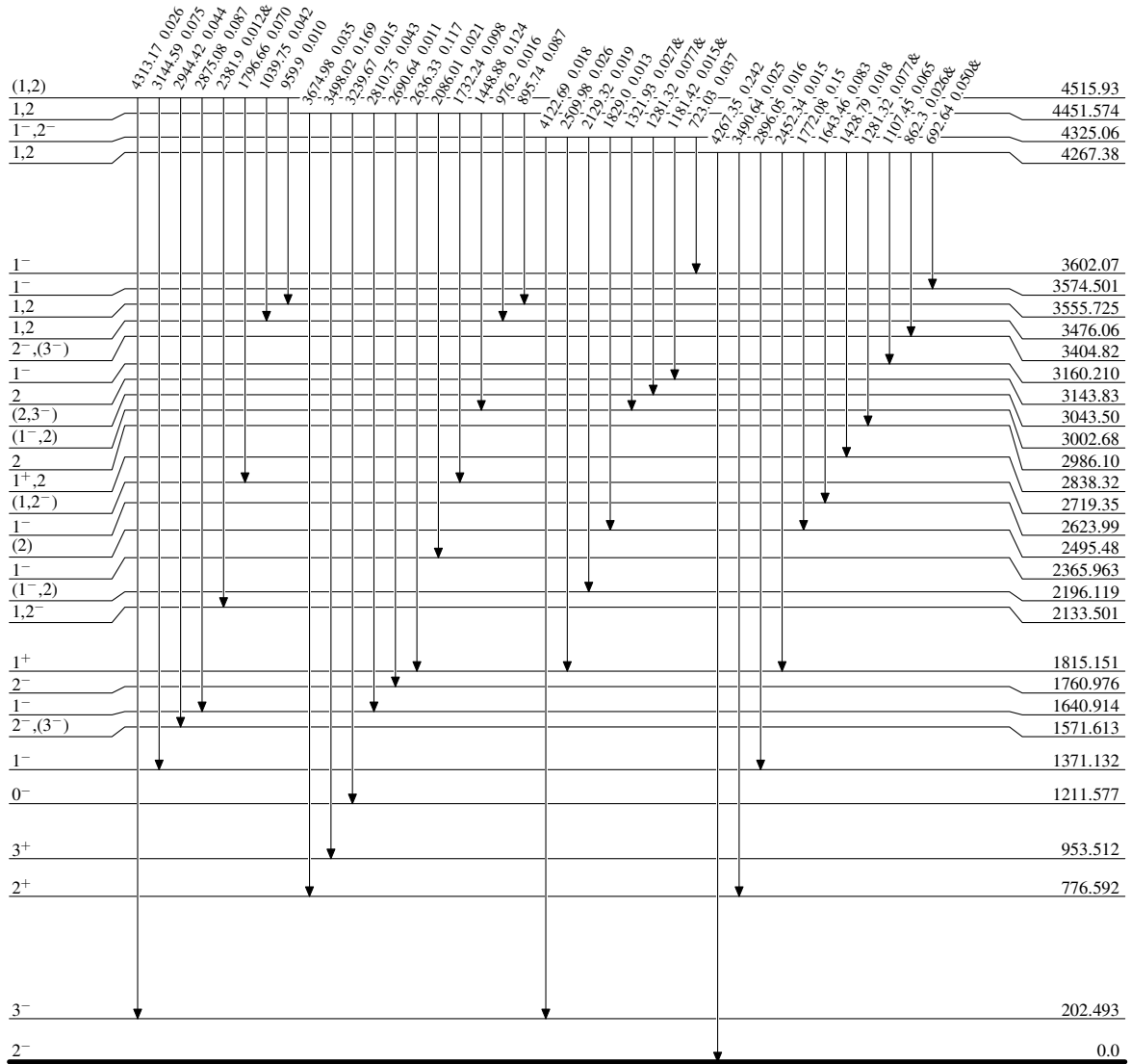
$^{89}\text{Y}(n,\gamma) \text{E=thermal } 1993\text{Mi04}$

Level Scheme (continued)

Legend

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

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$







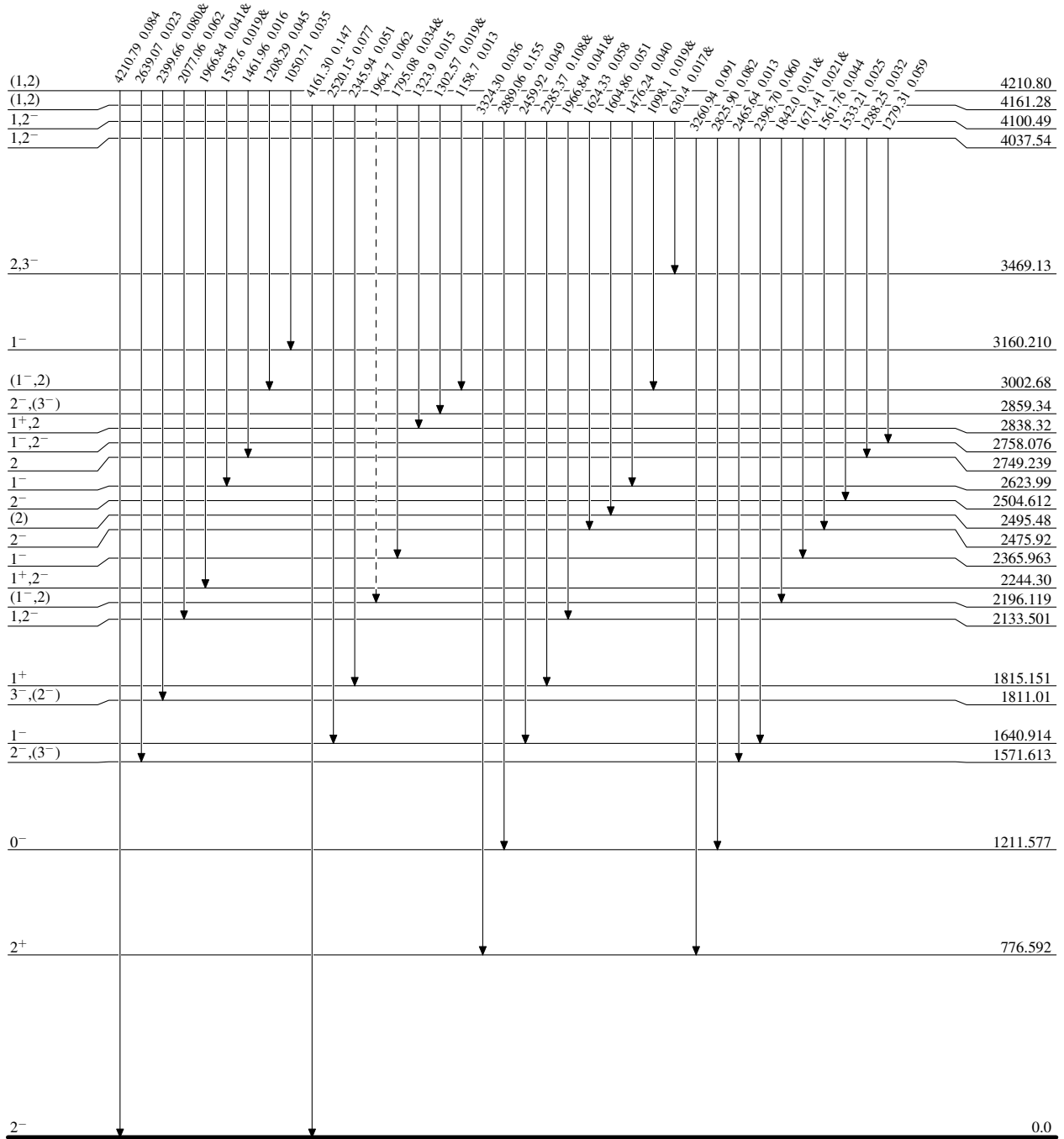
$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ 1993Mi04

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)



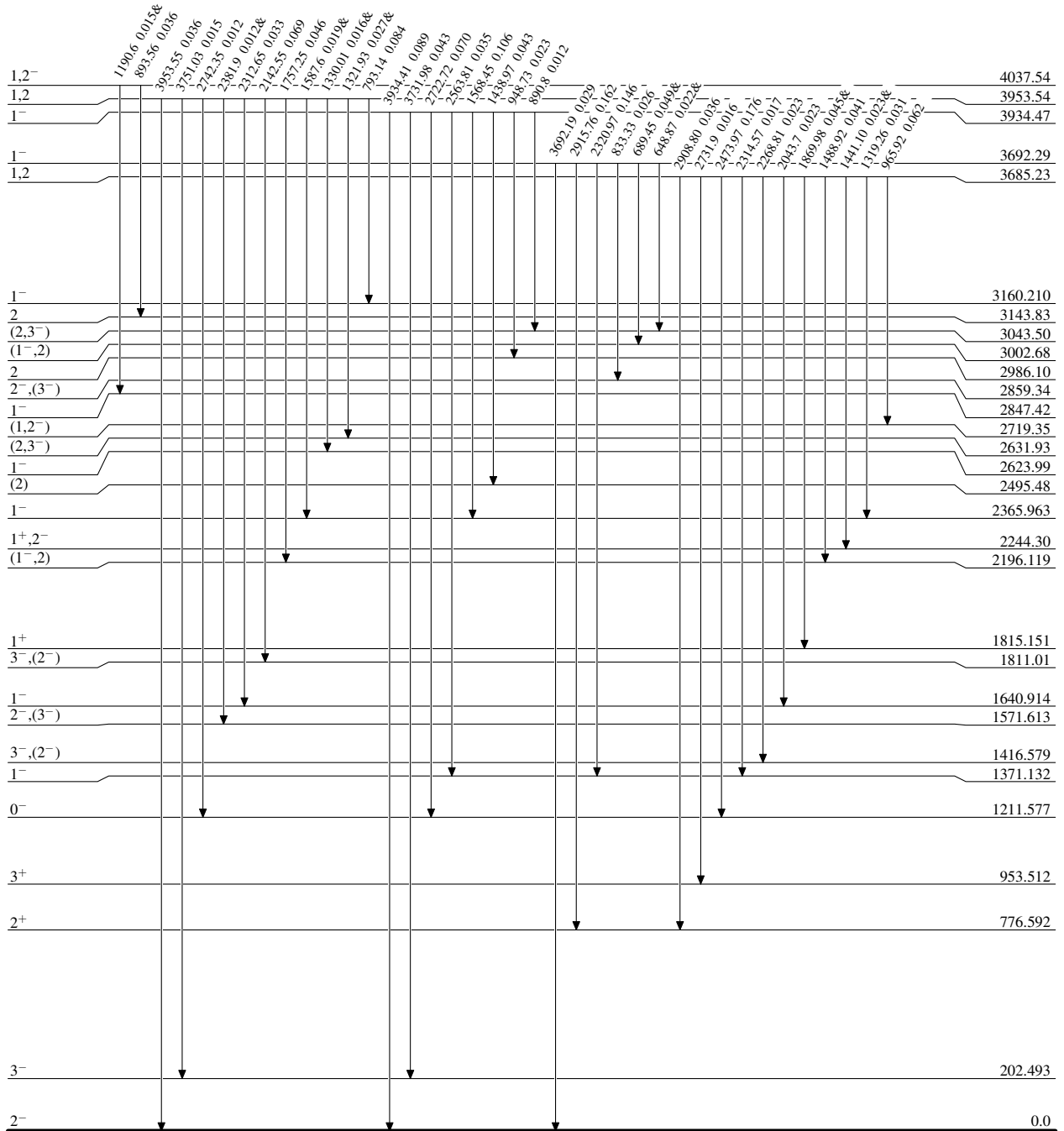
$^{89}\text{Y}(n,\gamma) \text{E=thermal}$ 1993Mi04

Level Scheme (continued)

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

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$







$^{90}_{39}\text{Y}_{51}$

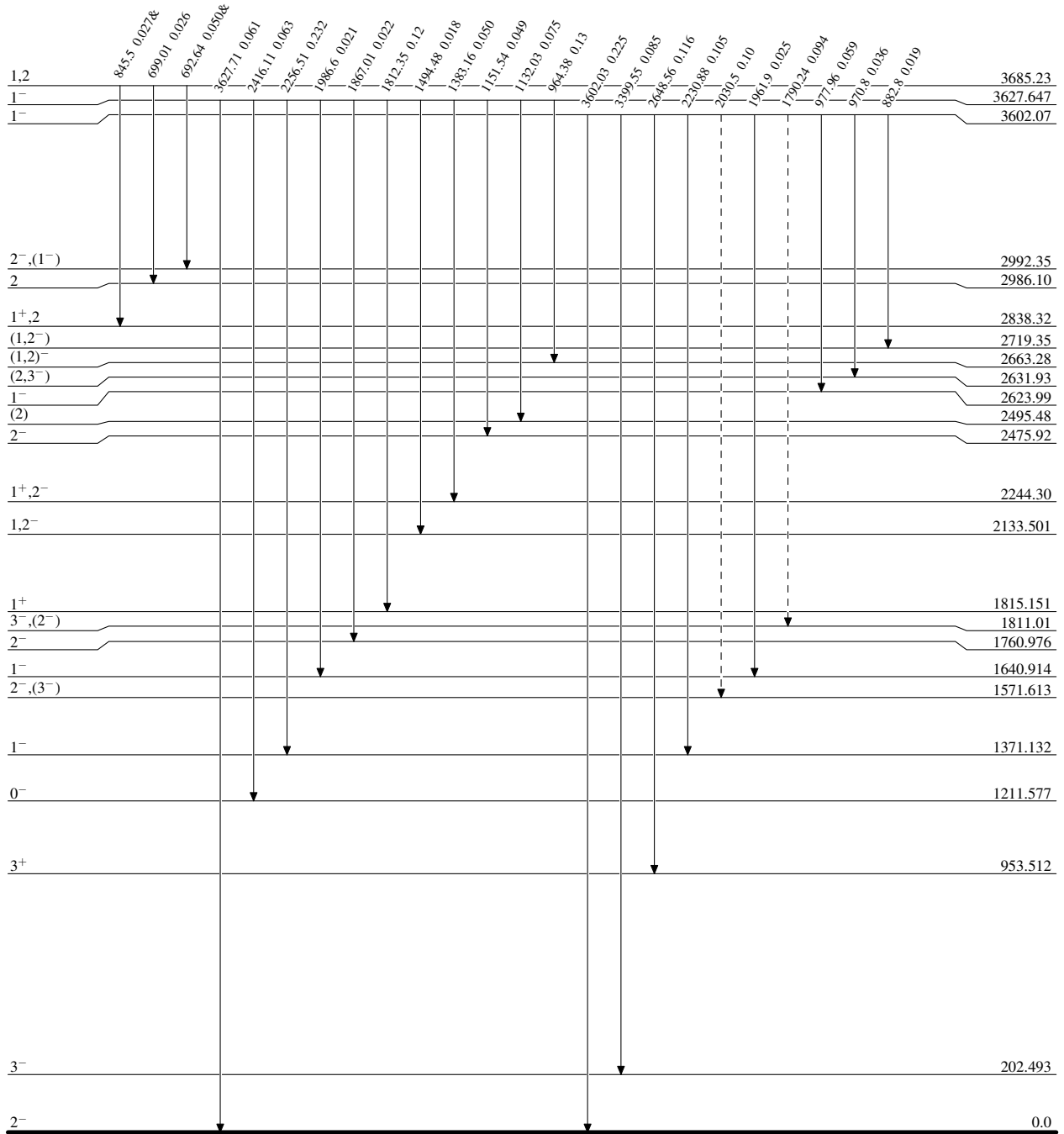
$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ 1993Mi04

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)



$^{90}_{39}\text{Y}_{51}$

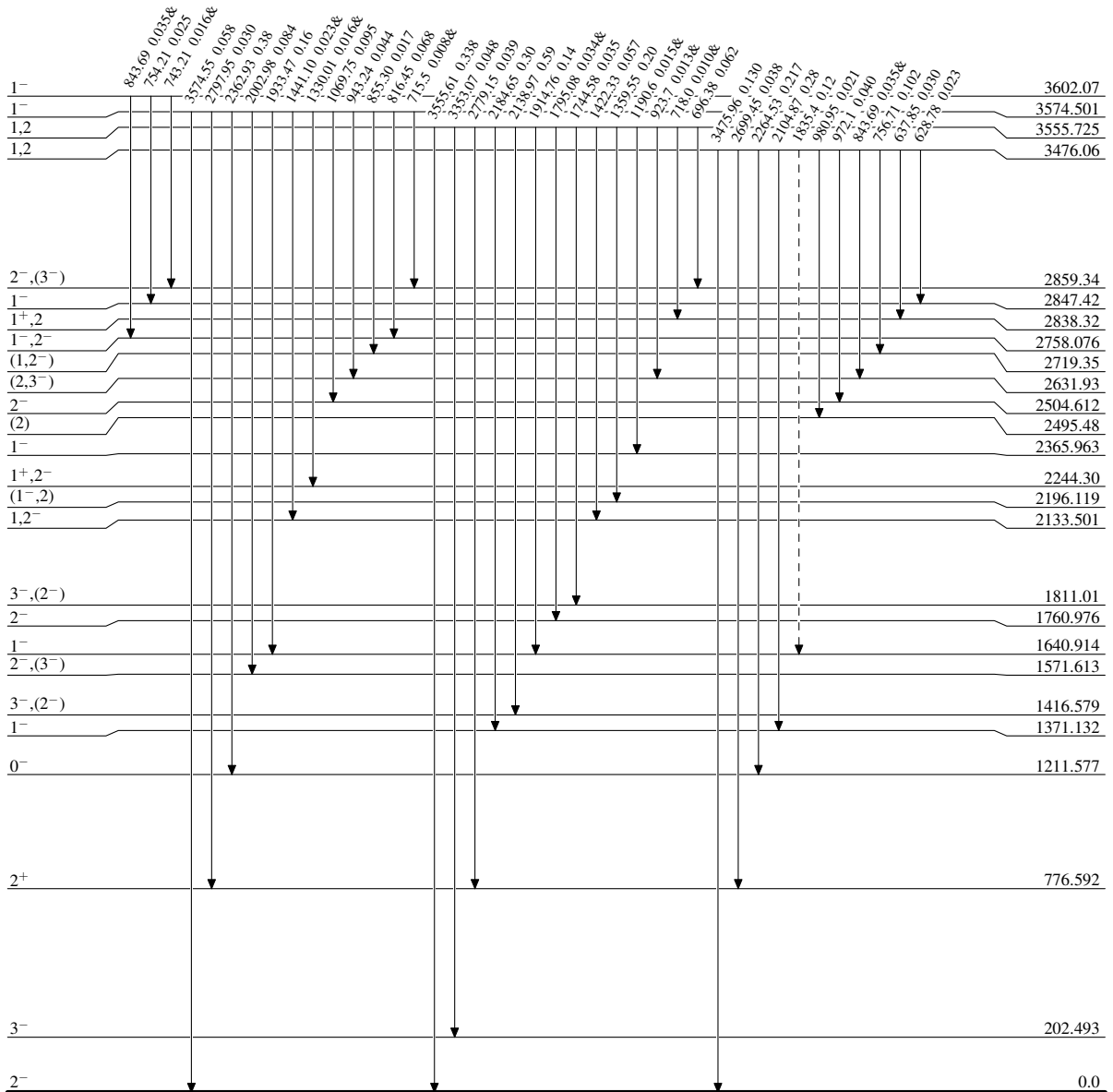
$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ 1993Mi04

Level Scheme (continued)

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

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - - γ Decay (Uncertain)



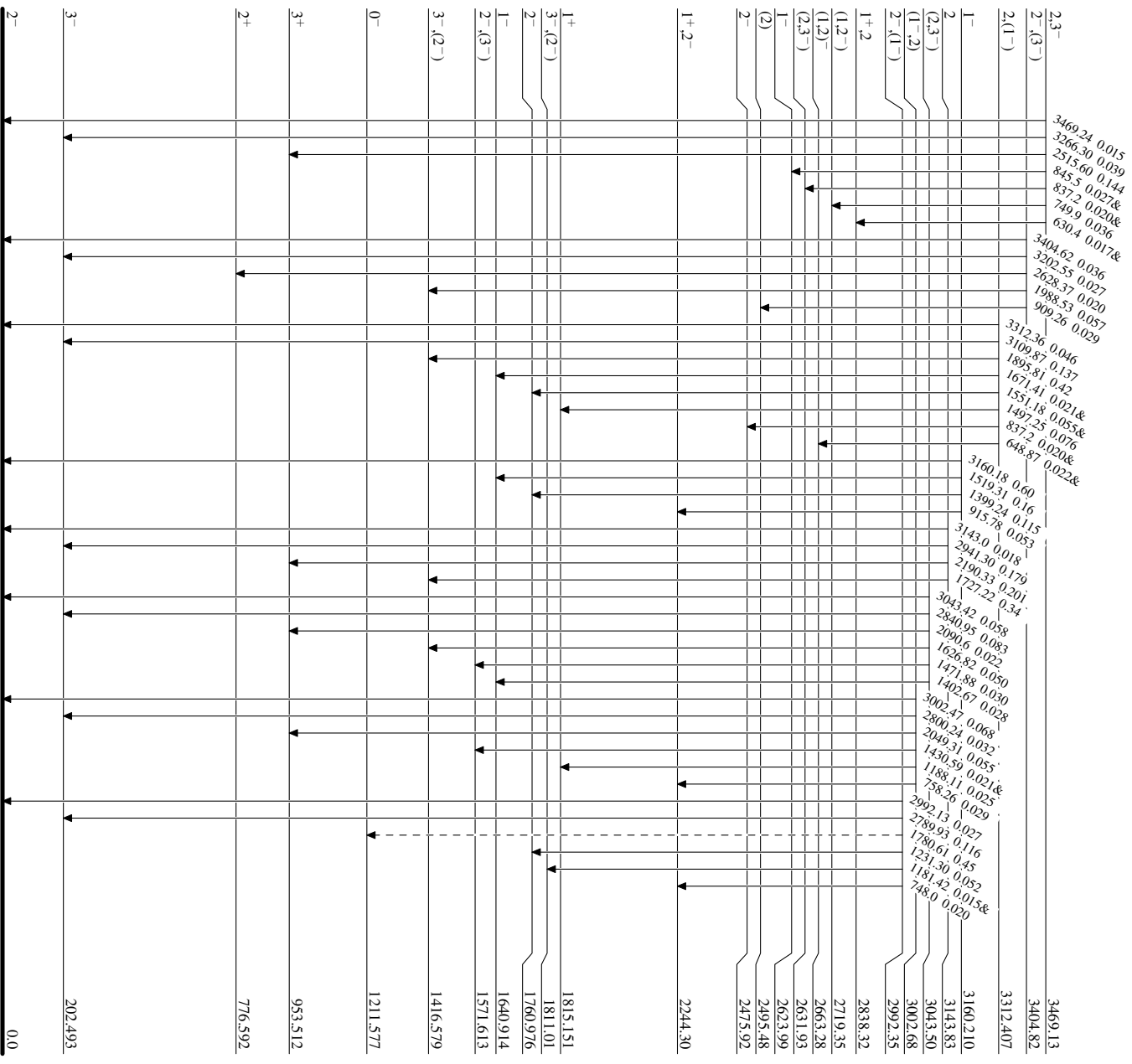
⁸⁹Y(n, γ) E=thermal 1993MI04

Level Scheme (continued)

Intensities: I _{γ} per 100 neutron captures
& Multiply placed: undivided intensity given

Legend

- ▶ I _{γ} < 2% × I _{γ max}
- ▶ I _{γ} < 10% × I _{γ max}
- ▶ I _{γ} > 10% × I _{γ max}
- - -▶ γ Decay (Uncertain)







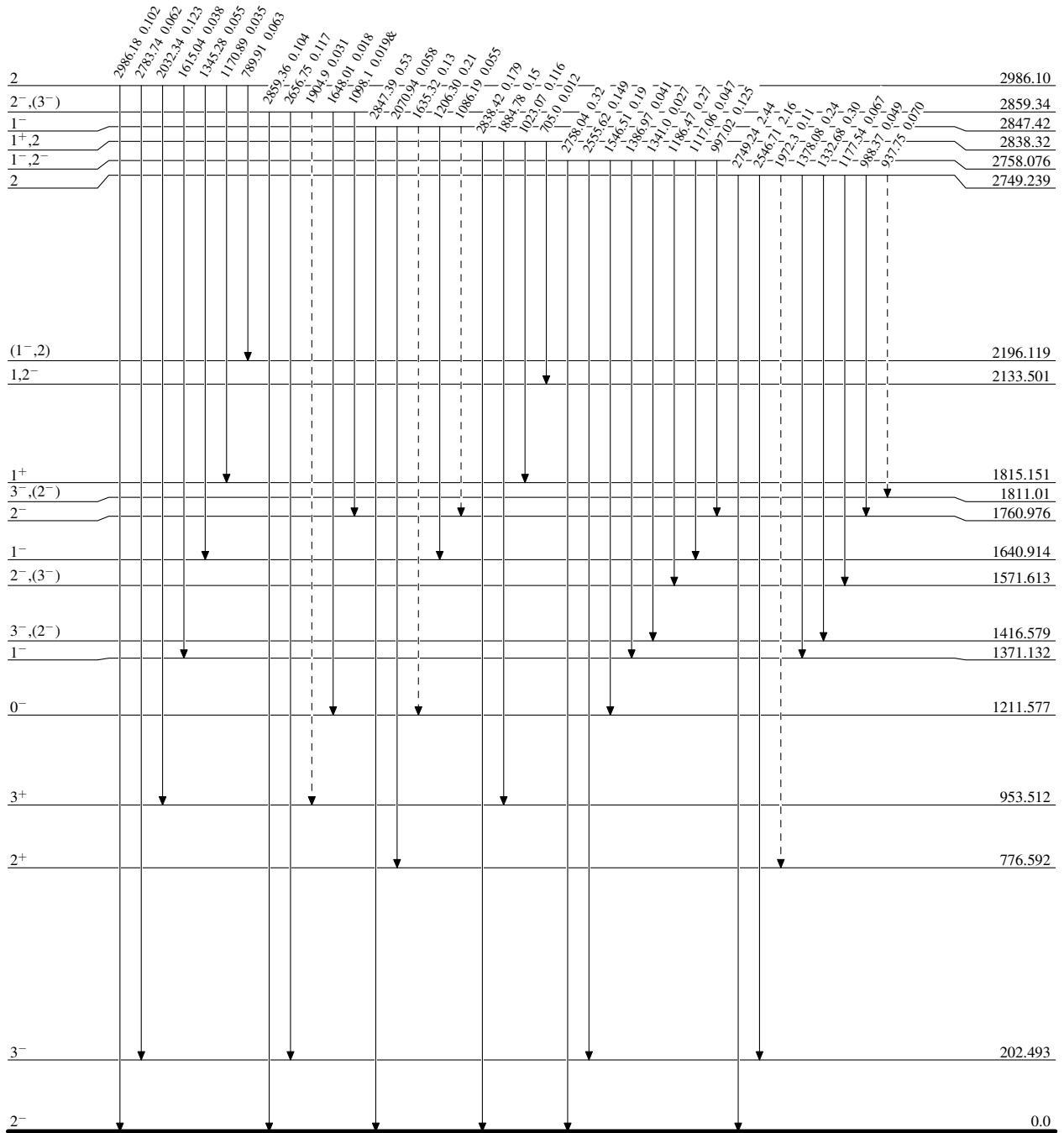
$^{89}\text{Y}(n,\gamma)\text{E=thermal}$ 1993Mi04

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)

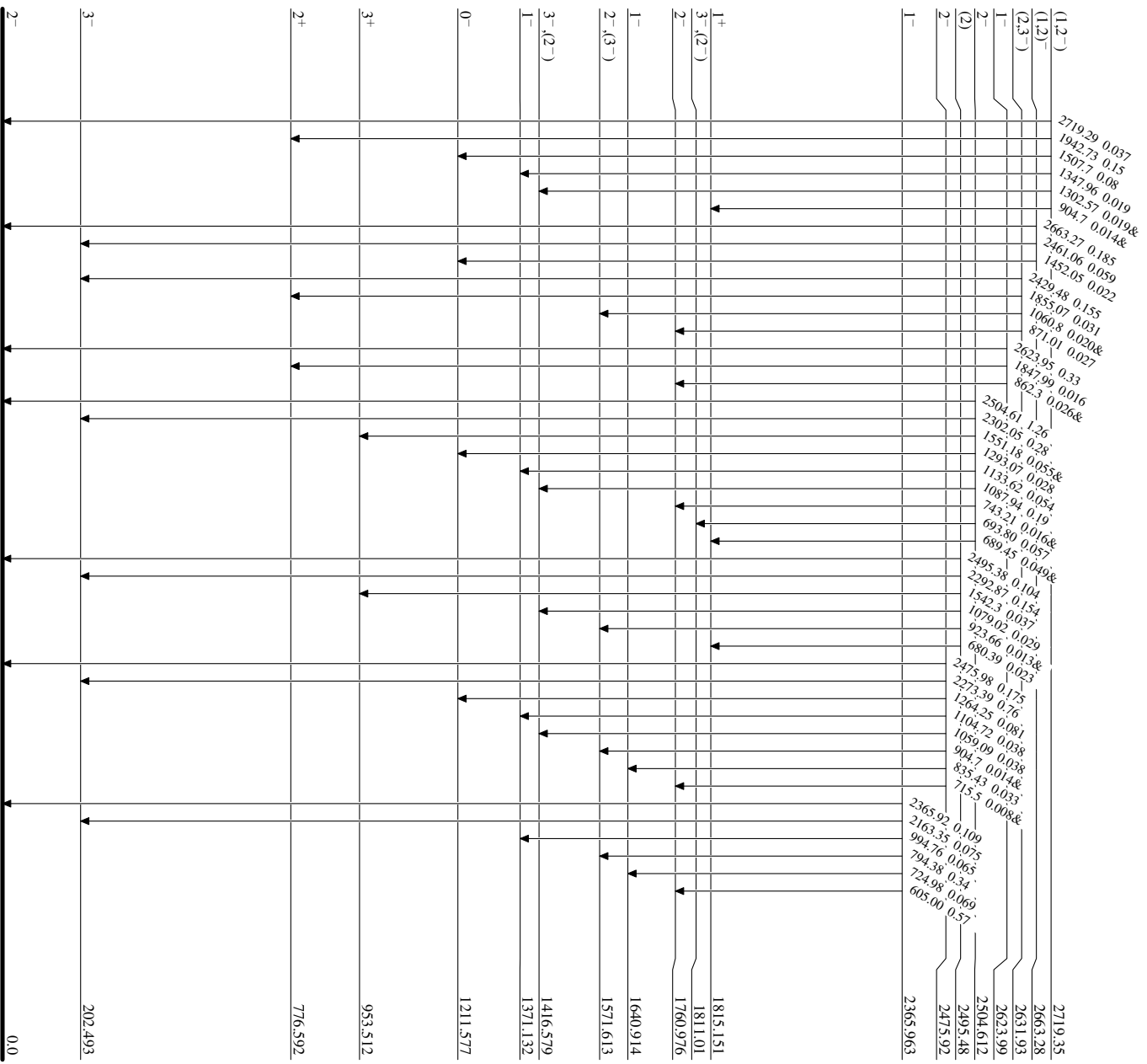
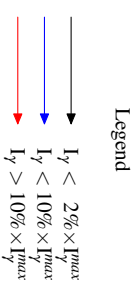


$^{90}_{39}\text{Y}_{51}$

⁸⁹Y(n, γ) E=thermal 1993MI04

Level Scheme (continued)

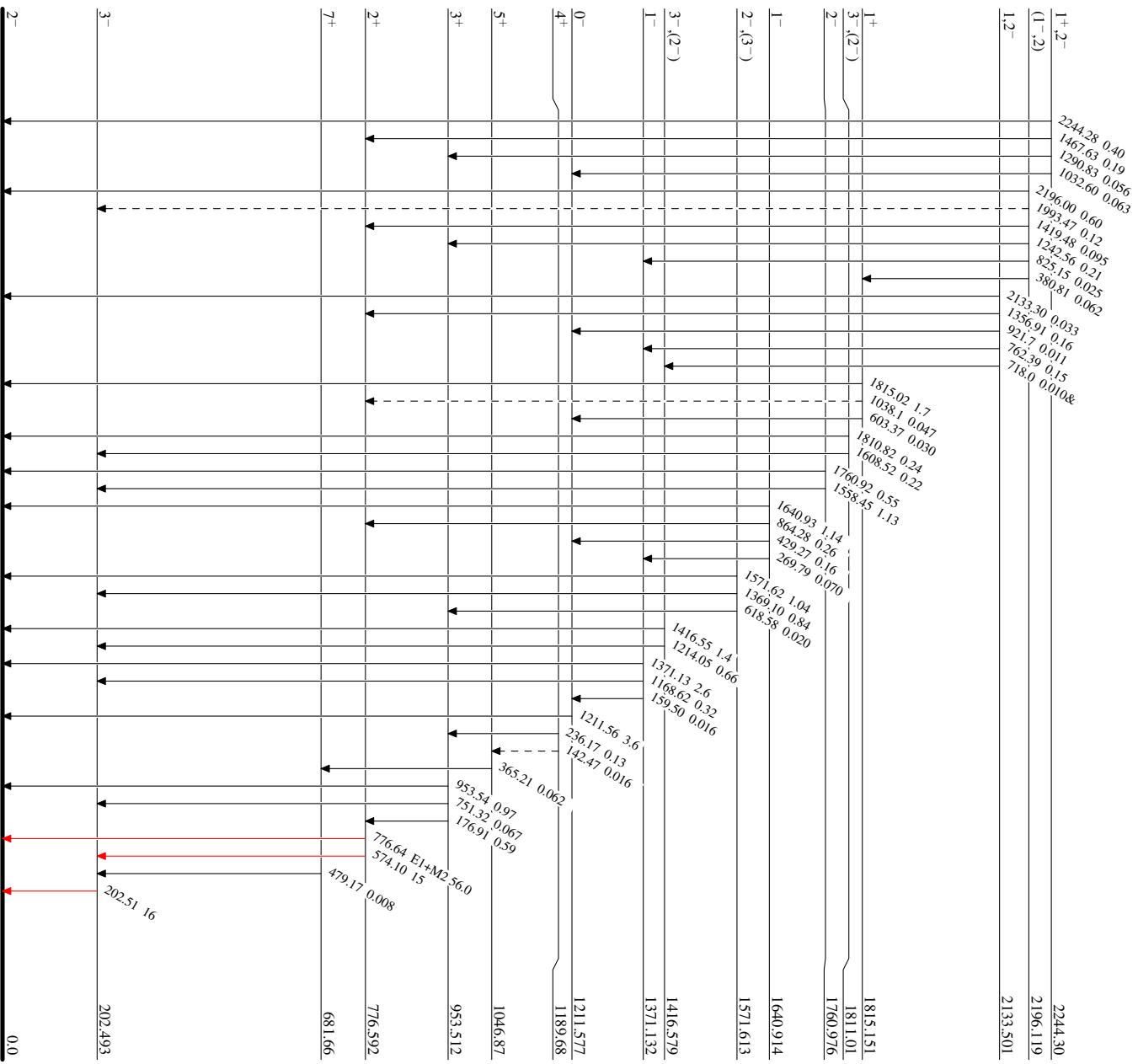
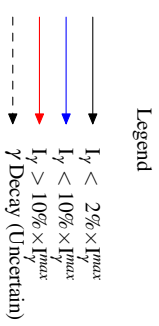
Intensities: I _{γ} per 100 neutron captures
& Multiply placed: undivided intensity given



⁸⁹Y(n, γ) E=thermal 1993MI04

Level Scheme (continued)

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



⁹⁰Y
³⁹Y₅₁