

$^{198}\text{Au}(n,\gamma)$ E=th **1991Ma65,1979Br26**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 108, 79 (2007)	15-Oct-2006

Successive neutron captures in ^{197}Au target, i.e., $^{197}\text{Au}(n,\gamma)^{198}\text{Au}(n,\gamma)^{199}\text{Au}$.

1991Ma65: measured: E_γ , I_γ , $E(\text{ce})$; cryst, electron spectrometer; method of calibration not stated. The reaction $^{197}\text{Au}(2n,\text{ce})^{199}\text{Au}$ was measured twice in order to identify ^{199}Au lines by their growing intensity.

1979Br26: high energy (primary) γ 's studied with pair spectrometer; ΔE does not include 0.2-keV uncertainty in calibration.

1971Br56: measured E_γ , I_γ ; cryst. These E_γ values are consistently lower than those of **1991Ma65** and those from ^{199}Pt β^- decay.

 ^{199}Au Levels

E(level) [†]	J^π [‡]	Comments
0.0	$3/2^+$	
77.1950 18	$1/2^+$	
317.0572 18	$5/2^+$	
323.6522 19	$3/2^+$	
493.7714 20	$(7/2)^+$	
542.9987 16	$5/2^+$	
548.9406 21	$(11/2)^-$	
734.7085 18	$7/2^-$	
791.7778 25	$3/2^+$	
822.538 3	$1/2^+$	
907.265 4	$3/2^+$	
968.339 3	$3/2^+, 5/2^+$	
1070.129 4	$3/2^+, 5/2^+$	
1103.964 4	$(3/2, 5/2, 7/2)^{+}$	
1159.384 5	$(3/2^+, 5/2^+, 7/2^+)$	
1249.715 4	$3/2^+, 5/2^+, 7/2^+$	
1396.321 7	$5/2^+, 7/2^+$	
1572.178 5		
1583.1 4		E(level): from primary gammas.
1770.44 4		
(7584.358 24)	$3/2^-, 5/2^-$	E(level): S(n)=7584.25 15 (2003Au03). J^π : s-wave capture In 2^- (^{198}Au g.s.).

[†] From least-squares fit to E_γ 's, omitting doublets.

[‡] From 'Adopted Levels'. $J^\pi(^{198}\text{Au g.s.})=2^-$ gives $3/2^-, 5/2^-$ for the capture state; therefore, the levels strongly fed by primary gammas in (n, γ) have $J=1/2$ to $J=7/2$.

 $\gamma(^{199}\text{Au})$

E_γ [†]	I_γ ^{‡,d}	$E_i(\text{level})$	J_i^π	E_f	J_f^π
55.150 19	0.010 10	548.9406	$(11/2)^-$	493.7714	$(7/2)^+$
77.160 19	0.010 10	77.1950	$1/2^+$	0.0	$3/2^+$
*183.435 8	0.010 2				
185.768 @ 1	0.407 4	734.7085	$7/2^-$	548.9406	$(11/2)^-$
191.709 1	0.244 3	734.7085	$7/2^-$	542.9987	$5/2^+$
*219.424 1	0.062 2				
225.945 4	0.014 2	542.9987	$5/2^+$	317.0572	$5/2^+$
239.864 2	0.057 5	317.0572	$5/2^+$	77.1950	$1/2^+$
246.456 1	1.04 3	323.6522	$3/2^+$	77.1950	$1/2^+$
*278.143 4	0.007 1				
*298.521 6	0.008 1				

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$^{198}\text{Au}(n,\gamma)$ E=th **1991Ma65,1979Br26 (continued)** $\gamma(^{199}\text{Au})$ (continued)

E_γ [†]	I_γ ^{†‡d}	$E_i(\text{level})$	J_i^π	E_f	J_f^π
317.056 3	1.36 3	317.0572	5/2 ⁺	0.0	3/2 ⁺
^x 318.593 6	0.006 [#] 1				
323.663 ^{&} 3	0.095 2	323.6522	3/2 ⁺	0.0	3/2 ⁺
^x 417.359 4	0.011 [#] 1				
417.657 3	0.023 [#] 1	734.7085	7/2 ⁻	317.0572	5/2 ⁺
425.340 3	0.030 [#] 1	968.339	3/2 ⁺ , 5/2 ⁺	542.9987	5/2 ⁺
^x 427.438 3	0.014 [#] 1				
465.806 3	0.051 1	542.9987	5/2 ⁺	77.1950	1/2 ⁺
468.130 ^e 4	0.074 ^e 3	791.7778	3/2 ⁺	323.6522	3/2 ⁺
468.130 ^e 4	0.074 ^e 3	1572.178		1103.964	(3/2, 5/2, 7/2) ⁽⁺⁾
474.719 3	0.085 1	791.7778	3/2 ⁺	317.0572	5/2 ⁺
493.772 2	1.39 3	493.7714	(7/2) ⁺	0.0	3/2 ⁺
505.480 2	0.343 9	822.538	1/2 ⁺	317.0572	5/2 ⁺
^x 521.400 2	0.037 9				
^x 524.121 2	0.040 2				
542.993 2	0.930 20	542.9987	5/2 ⁺	0.0	3/2 ⁺
^x 562.821 4	0.076 1				
^x 586.728 6	0.017 [#] 1				
590.209 3	0.137 7	907.265	3/2 ⁺	317.0572	5/2 ⁺
^x 601.344 4	0.110 1				
603.779 ^c 19	0.006 [#] 1	1572.178		968.339	3/2 ⁺ , 5/2 ⁺
610.191 3	0.039 2	1103.964	(3/2, 5/2, 7/2) ⁽⁺⁾	493.7714	(7/2) ⁺
^x 613.187 7	0.009 [#] 1				
^x 628.324 4	0.034 1				
644.684 8	0.022 [#] 1	968.339	3/2 ⁺ , 5/2 ⁺	323.6522	3/2 ⁺
^x 650.160 4	0.025 2				
664.913 3	0.100 2	1572.178		907.265	3/2 ⁺
^x 685.634 3	0.067 2				
706.715 3	0.073 3	1249.715	3/2 ⁺ , 5/2 ⁺ , 7/2 ⁺	542.9987	5/2 ⁺
714.583 3	0.200 9	791.7778	3/2 ⁺	77.1950	1/2 ⁺
^x 715.831 4	0.067 2				
^x 735.936 7	0.052 2				
746.483 4	0.153 4	1070.129	3/2 ⁺ , 5/2 ⁺	323.6522	3/2 ⁺
753.061 4	0.176 9	1070.129	3/2 ⁺ , 5/2 ⁺	317.0572	5/2 ⁺
^x 755.528 8	0.042 2				
780.337 ^e 7	0.176 ^e 8	1103.964	(3/2, 5/2, 7/2) ⁽⁺⁾	323.6522	3/2 ⁺
780.337 ^e 7	0.176 ^e 8	1572.178		791.7778	3/2 ⁺
791.777 6	0.132 7	791.7778	3/2 ⁺	0.0	3/2 ⁺
^x 819.889 7	0.101 8				
842.324 4	0.099 14	1159.384	(3/2 ⁺ , 5/2 ⁺ , 7/2 ⁺)	317.0572	5/2 ⁺
^x 860.450 6	0.064 10				
902.613 ^a 13	0.082 7	1396.321	5/2 ⁺ , 7/2 ⁺	493.7714	(7/2) ⁺
^x 924.752 7	0.060 2				
968.328 7	0.33 3	968.339	3/2 ⁺ , 5/2 ⁺	0.0	3/2 ⁺
^x 992.68 4	0.124 7				
1072.641 ^b 8	0.085 7	1396.321	5/2 ⁺ , 7/2 ⁺	323.6522	3/2 ⁺
1103.964 12	0.096 16	1103.964	(3/2, 5/2, 7/2) ⁽⁺⁾	0.0	3/2 ⁺
1159.44 4	0.083 12	1159.384	(3/2 ⁺ , 5/2 ⁺ , 7/2 ⁺)	0.0	3/2 ⁺
1249.718 14	0.166 10	1249.715	3/2 ⁺ , 5/2 ⁺ , 7/2 ⁺	0.0	3/2 ⁺
^x 1419.738 21	0.043 12				
^x 1430.62 10	0.032 12				
1446.81 4	0.063 14	1770.44		323.6522	3/2 ⁺
^x 1456.64 4	0.030 10				

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$^{198}\text{Au}(n,\gamma) \text{E=th}$ **1991Ma65,1979Br26** (continued) $\gamma(^{199}\text{Au})$ (continued)

$E_\gamma^\dagger$	$I_\gamma^{\ddagger d}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
$^x 1496.77\ 4$	0.046 12				
$^x 1543.50\ 4$	0.04 3				
$^x 1557.47\ 6$	0.025 23				
1572.16 3	0.052 25	1572.178		0.0	3/2 ⁺
5813.90 6	0.185 1	(7584.358)	3/2 ⁻ , 5/2 ⁻	1770.44	
6001.2 4	0.005 1	(7584.358)	3/2 ⁻ , 5/2 ⁻	1583.1	
6187.98 7	0.068 4	(7584.358)	3/2 ⁻ , 5/2 ⁻	1396.321	5/2 ⁺ , 7/2 ⁺
6334.60 8	0.107 6	(7584.358)	3/2 ⁻ , 5/2 ⁻	1249.715	3/2 ⁺ , 5/2 ⁺ , 7/2 ⁺
6424.88 7	0.065 4	(7584.358)	3/2 ⁻ , 5/2 ⁻	1159.384	(3/2 ⁺ , 5/2 ⁺ , 7/2 ⁺)
6480.28 7	0.068 4	(7584.358)	3/2 ⁻ , 5/2 ⁻	1103.964	(3/2, 5/2, 7/2) ⁽⁺⁾
6761.5 6	0.010 4	(7584.358)	3/2 ⁻ , 5/2 ⁻	822.538	1/2 ⁺
6792.39 10	0.017 1	(7584.358)	3/2 ⁻ , 5/2 ⁻	791.7778	3/2 ⁺
6849.23 23	0.0030 5	(7584.358)	3/2 ⁻ , 5/2 ⁻	734.7085	7/2 ⁻
7041.27 8	0.022 1	(7584.358)	3/2 ⁻ , 5/2 ⁻	542.9987	5/2 ⁺
7090.49 9	0.018 1	(7584.358)	3/2 ⁻ , 5/2 ⁻	493.7714	(7/2) ⁺
7260.45 6	0.088 5	(7584.358)	3/2 ⁻ , 5/2 ⁻	323.6522	3/2 ⁺
7267.09 8	0.048 3	(7584.358)	3/2 ⁻ , 5/2 ⁻	317.0572	5/2 ⁺

[†] Primary gammas ($E_\gamma > 5$ MeV) from **1979Br26**, others from **1991Ma65**.

[‡] Per 100 neutron captures.

[#] ΔI_γ increased by evaluator to 1 in the last significant digit given by authors.

@ γ not placed in level scheme by **1991Ma65**, possibly an oversight.

& Level-energy difference=323.652.

^a Level-energy difference=902.547.

^b Level-energy difference=1072.665.

^c Level-energy difference=603.838.

^d Intensity per 100 neutron captures.

^e Multiply placed with intensity suitably divided.

^x γ ray not placed in level scheme.

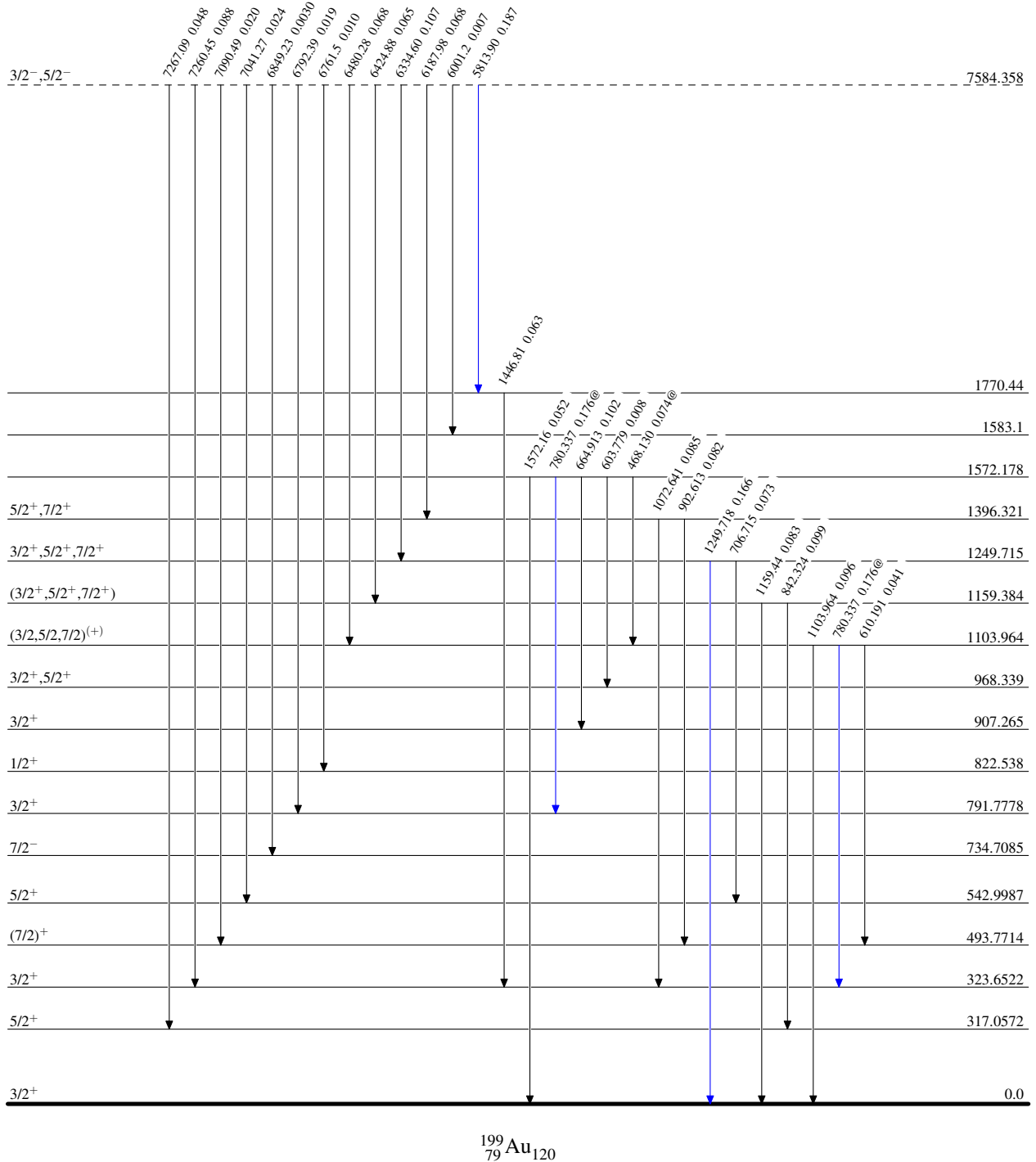
$^{198}\text{Au}(n,\gamma) \text{E=th}$ 1991Ma65,1979Br26

Level Scheme

Intensities: Per 100 N-captures
@ Multiply placed: intensity suitably divided

Legend

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



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Level Scheme (continued)

Intensities: Per 100 N-captures
 @ Multiply placed: intensity suitably divided

Legend

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

