
 $^{96}\text{Ru}(\alpha, n\gamma)$ **1988Du07**

Type	Author	History	Literature Cutoff Date
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E=18 MeV. Also studied $^{96}\text{Ru}({}^6\text{Li}, p2n\gamma)$.

Measured: γ , $\gamma\gamma$, $\gamma(\theta)$, excit.

 ^{99}Pd Levels

E(level)	J^π [†]	E(level)	J^π [†]	E(level)	J^π [†]	E(level)	J^π [†]
0.0	(5/2) ⁺	832.5 6	(9/2) ⁺	1649.5 10	(13/2) ⁺	2145.9 13	(11/2)
219.6 6	(3/2) ⁺	1069.9 8	(11/2) ⁺	1696.4 9	(9/2) ⁺	2205.8 15	(11/2) ⁺
263.8 6	(7/2) ⁺	1102.3 7	(9/2) ⁺	1718.9 12	(15/2) ⁺	2269.0 9	(7/2) ⁺
463.2 8	(3/2) ⁺	1182.2 8	(3/2, 5/2) ⁺	1853.2 9	(9/2) ⁺	2426.3 12	(13/2) ⁺
555.2 12	(5/2, 7/2)	1419.8 12		2006.6 12	(7/2, 9/2)	2600.7 15	(19/2) ⁺
686.7 6	(5/2) ⁺	1468.5 7	(11/2) ⁺	2017.8 10	11/2 ⁽⁻⁾		
815.3 6	(7/2) ⁺	1540.5 7	(9/2) ⁺	2062.5?			

[†] Adopted values.

⁹⁶Ru($\alpha, n\gamma$) **1988Du07** (continued)

$\gamma(^{99}\text{Pd})$									
E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	$\delta^@$	$\alpha^\#$	Comments
219.6	87 4	219.6	(3/2) ⁺	0.0	(5/2) ⁺				Mult.: $A_2=-0.076$ 60, $A_4=+0.060$ 70.
243.5	9.5 9	463.2	(3/2) ⁺	219.6	(3/2) ⁺				
263.8 [†]		263.8	(7/2) ⁺	0.0	(5/2) ⁺				
287.0	6.1 6	1102.3	(9/2) ⁺	815.3	(7/2) ⁺	(M1)		0.0222	
									$\alpha(K)=0.0193$ 3; $\alpha(L)=0.00231$ 4; $\alpha(M)=0.000434$ 6 $\alpha(N)=7.32\times 10^{-5}$ 11 Mult.: $A_2=-0.250$ 50, $A_4=+0.050$ 60.
335.6	13.0 11	555.2	(5/2,7/2)	219.6	(3/2) ⁺				Mult.: $A_2=-0.015$ 30, $A_4=-0.025$ 45. Mult.: $A_2=+0.146$ 65, $A_4=-0.034$ 75. $\alpha(K)=0.00559$ 8; $\alpha(L)=0.000713$ 10; $\alpha(M)=0.0001342$ 19 $\alpha(N)=2.23\times 10^{-5}$ 4 Mult.: $A_2=+0.290$ 40, $A_4=-0.060$ 50.
384.6 [†]		1853.2	(9/2) ⁺	1468.5	(11/2) ⁺				
398.6 [†]		1468.5	(11/2) ⁺	1069.9	(11/2) ⁺				
422.9	3.5 5	686.7	(5/2) ⁺	263.8	(7/2) ⁺				
463.3	40 6	463.2	(3/2) ⁺	0.0	(5/2) ⁺				
467.1	10.1 10	686.7	(5/2) ⁺	219.6	(3/2) ⁺				
486.9	12.3 8	2205.8	(11/2) ⁺	1718.9	(15/2) ⁺	E2		0.00646	
551.5 [†]		815.3	(7/2) ⁺	263.8	(7/2) ⁺				
568.7	75 6	832.5	(9/2) ⁺	263.8	(7/2) ⁺	M1+E2	+1.1 5	0.00412	$\alpha(K)=0.00359$ 5; $\alpha(L)=0.000436$ 11; $\alpha(M)=8.19\times 10^{-5}$ 20 $\alpha(N)=1.37\times 10^{-5}$ 3 Mult.: $A_2=+0.360$ 30, $A_4=+0.115$ 40.
579.7	10.2 8	1649.5	(13/2) ⁺	1069.9	(11/2) ⁺	(M1+E2)	-0.8 +10-3	0.00392	$\alpha(K)=0.00342$ 5; $\alpha(L)=0.000410$ 10; $\alpha(M)=7.71\times 10^{-5}$ 20 $\alpha(N)=1.29\times 10^{-5}$ 3 Mult.: $A_2=-0.788$ 55, $A_4=+0.080$ 65.
595.6 [†]		815.3	(7/2) ⁺	219.6	(3/2) ⁺				Mult.: $A_2=-0.725$ 40, $A_4=+0.035$ 50. $\alpha(K)=0.00252$ 4; $\alpha(L)=0.000309$ 5; $\alpha(M)=5.81\times 10^{-5}$ 9 $\alpha(N)=9.71\times 10^{-6}$ 14 Mult.: $A_2=+0.410$ 40, $A_4=-0.115$ 50.
636.0	20.6 12	1468.5	(11/2) ⁺	832.5	(9/2) ⁺	(M1+E2)	-0.7 +6-8	0.00312 6	
648.9	84 4	1718.9	(15/2) ⁺	1069.9	(11/2) ⁺	E2		0.00290	
653.2 [†]		1468.5	(11/2) ⁺	815.3	(7/2) ⁺				
686.6	65 5	686.7	(5/2) ⁺	0.0	(5/2) ⁺	M1+E2	-1.2 4	0.00255 5	$\alpha(K)=0.00223$ 5; $\alpha(L)=0.000267$ 4; $\alpha(M)=5.01\times 10^{-5}$ 8 $\alpha(N)=8.41\times 10^{-6}$ 13 Mult.: $A_2=+0.445$ 45, $A_4=-0.130$ 55.
707.4	11.6 10	2426.3	(13/2) ⁺	1718.9	(15/2) ⁺	(M1+E2)	-0.7 +13-3	0.00241 5	$\alpha(K)=0.00211$ 4; $\alpha(L)=0.000249$ 4; $\alpha(M)=4.67\times 10^{-5}$ 7 $\alpha(N)=7.86\times 10^{-6}$ 12 Mult.: $A_2=+0.375$ 40, $A_4=+0.010$ 50.
725.2 10	13.2 10	1540.5	(9/2) ⁺	815.3	(7/2) ⁺	(M1)		0.00232	$\alpha(K)=0.00204$ 3; $\alpha(L)=0.000237$ 4; $\alpha(M)=4.44\times 10^{-5}$ 7 $\alpha(N)=7.49\times 10^{-6}$ 11 Mult.: $A_2=-0.260$ 40, $A_4=+0.045$ 50.
728.5	11.8 9	2269.0	(7/2) ⁺	1540.5	(9/2) ⁺	(M1)		0.00230	$\alpha(K)=0.00201$ 3; $\alpha(L)=0.000234$ 4; $\alpha(M)=4.39\times 10^{-5}$ 7

⁹⁶Ru($\alpha, n\gamma$) 1988Du07 (continued) **$\gamma(^{99}\text{Pd})$ (continued)**

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	$\delta^@$	$\alpha^\#$	Comments
751.0	17.5 8	1853.2	(9/2 ⁺)	1102.3	(9/2) ⁺	M1+E2	+0.8 2	0.00208 4	$\alpha(\text{N})=7.41\times 10^{-6}$ 11 Mult.: $A_2=-0.315$ 40, $A_4=-0.030$ 50. $\alpha(\text{K})=0.00182$ 4; $\alpha(\text{L})=0.000215$ 4; $\alpha(\text{M})=4.03\times 10^{-5}$ 6 $\alpha(\text{N})=6.78\times 10^{-6}$ 11
806.1	100.0	1069.9	(11/2) ⁺	263.8	(7/2) ⁺	E2		1.67×10^{-3}	Mult.: $A_2=+0.425$ 45, $A_4=-0.125$ 55. $\alpha(\text{K})=0.001455$ 21; $\alpha(\text{L})=0.0001747$ 25; $\alpha(\text{M})=3.28\times 10^{-5}$ 5 $\alpha(\text{N})=5.49\times 10^{-6}$ 8
815.3	116 7	815.3	(7/2) ⁺	0.0	(5/2) ⁺	M1+E2	-1.4 4	0.00168 4	Mult.: $A_2=+0.355$ 35, $A_4=-0.080$ 45. $\alpha(\text{K})=0.00146$ 4; $\alpha(\text{L})=0.000173$ 3; $\alpha(\text{M})=3.25\times 10^{-5}$ 6 $\alpha(\text{N})=5.47\times 10^{-6}$ 10
817.0	96 6	1649.5	(13/2) ⁺	832.5	(9/2) ⁺	E2		1.61×10^{-3}	Mult.: $A_2=-0.525$ 45, $A_4=+0.078$ 55. $\alpha(\text{K})=0.001409$ 20; $\alpha(\text{L})=0.0001689$ 24; $\alpha(\text{M})=3.17\times 10^{-5}$ 5 $\alpha(\text{N})=5.31\times 10^{-6}$ 8
832.5 [†]		832.5	(9/2) ⁺	0.0	(5/2) ⁺				Mult.: $A_2=+0.260$ 35, $A_4=-0.060$ 45.
838.5	28.1 20	1102.3	(9/2) ⁺	263.8	(7/2) ⁺	(M1+E2)	+1.9 +39-10	0.00155 6	$\alpha(\text{K})=0.00135$ 5; $\alpha(\text{L})=0.000161$ 5; $\alpha(\text{M})=3.01\times 10^{-5}$ 9 $\alpha(\text{N})=5.06\times 10^{-6}$ 15
853.8	15.1 18	1540.5	(9/2) ⁺	686.7	(5/2) ⁺	E2		1.45×10^{-3}	Mult.: $A_2=+0.608$ 50, $A_4=+0.225$ 60. $\alpha(\text{K})=0.001267$ 18; $\alpha(\text{L})=0.0001514$ 22; $\alpha(\text{M})=2.84\times 10^{-5}$ 4 $\alpha(\text{N})=4.76\times 10^{-6}$ 7
863.9	9.6 8	1696.4	(9/2 ⁺)	832.5	(9/2) ⁺				Mult.: $A_2=+0.284$ 35, $A_4=-0.068$ 45.
881.8	13.1 9	2600.7	(19/2) ⁺	1718.9	(15/2) ⁺	E2		1.34×10^{-3}	Mult.: $A_2=+0.135$ 40, $A_4=-0.020$ 50. $\alpha(\text{K})=0.001174$ 17; $\alpha(\text{L})=0.0001399$ 20; $\alpha(\text{M})=2.62\times 10^{-5}$ 4 $\alpha(\text{N})=4.40\times 10^{-6}$ 7
947.9	14.5 9	2017.8	11/2 ⁽⁻⁾	1069.9	(11/2) ⁺				Mult.: $A_2=+0.328$ 37, $A_4=-0.090$ 45.
962.7	14.4 9	1182.2	(3/2,5/2) ⁺	219.6	(3/2) ⁺	(M1+E2)	+0.13 7	1.22×10^{-3}	Mult.: $A_2=+0.307$ 37, $A_4=-0.018$ 45. $\alpha(\text{K})=0.001074$ 16; $\alpha(\text{L})=0.0001240$ 18; $\alpha(\text{M})=2.32\times 10^{-5}$ 4 $\alpha(\text{N})=3.92\times 10^{-6}$ 6
1076.0	8.2 9	2145.9	(11/2)	1069.9	(11/2) ⁺	D(+Q)	+0.5 10		Mult.: $A_2=-0.330$ 40, $A_4=-0.015$ 5.
1102.3	37.4 25	1102.3	(9/2) ⁺	0.0	(5/2) ⁺	E2		8.12×10^{-4}	Mult.: $A_2=+0.564$ 60, $A_4=-0.140$ 70. $\alpha(\text{K})=0.000710$ 10; $\alpha(\text{L})=8.31\times 10^{-5}$ 12; $\alpha(\text{M})=1.557\times 10^{-5}$ 22 $\alpha(\text{N})=2.62\times 10^{-6}$ 4; $\alpha(\text{IPF})=5.85\times 10^{-7}$ 9 Mult.: $A_2=+0.310$ 35, $A_4=-0.060$ 45.

⁹⁶Ru($\alpha, n\gamma$) **1988Du07** (continued)

$\gamma(^{99}\text{Pd})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	$\alpha^\#$	Comments
1156.0 [†]		1419.8		263.8	(7/2) ⁺			
1174.1	5.7 7	2006.6	(7/2,9/2)	832.5	(9/2) ⁺			
1182.1	9.5 9	1182.2	(3/2,5/2) ⁺	0.0	(5/2) ⁺	(M1+E2)	0.00075 5	Mult.: $A_2=+0.520$ 40, $A_4=-0.095$ 50. $\alpha(K)=0.00065$ 4; $\alpha(L)=7.5\times 10^{-5}$ 4; $\alpha(M)=1.41\times 10^{-5}$ 8 $\alpha(N)=2.37\times 10^{-6}$ 13; $\alpha(IPF)=4.8\times 10^{-6}$ 5 Mult.: $A_2=+0.158$ 35, $A_4=-0.035$ 45.
1185.3	32.9 14	2017.8	11/2 ⁽⁻⁾	832.5	(9/2) ⁺			Mult.: $A_2=-0.165$ 35, $A_4=+0.040$ 45.
1204.7	23.2 9	1468.5	(11/2) ⁺	263.8	(7/2) ⁺	E2	6.78 $\times 10^{-4}$	$\alpha(K)=0.000587$ 9; $\alpha(L)=6.84\times 10^{-5}$ 10; $\alpha(M)=1.280\times 10^{-5}$ 18 $\alpha(N)=2.16\times 10^{-6}$ 3; $\alpha(IPF)=7.94\times 10^{-6}$ 12 Mult.: $A_2=+0.325$ 35, $A_4=-0.060$ 45.
1230.0 ^{&}		2062.5?		832.5	(9/2) ⁺			
1276.7	21.8 9	1540.5	(9/2) ⁺	263.8	(7/2) ⁺			Mult.: $A_2=+0.150$ 75, $A_4=+0.110$ 85.
1356.5	9.5 15	2426.3	(13/2 ⁺)	1069.9	(11/2) ⁺	(M1)	6.17 $\times 10^{-4}$	$\alpha(K)=0.000513$ 8; $\alpha(L)=5.88\times 10^{-5}$ 9; $\alpha(M)=1.100\times 10^{-5}$ 16 $\alpha(N)=1.86\times 10^{-6}$ 3; $\alpha(IPF)=3.25\times 10^{-5}$ 5 Mult.: $A_2=-0.205$ 40, $A_4=+0.050$ 50.
1432.6	13.2 10	1696.4	(9/2 ⁺)	263.8	(7/2) ⁺	(M1+E2)	5.51 $\times 10^{-4}$ 24	$\alpha(K)=0.000435$ 24; $\alpha(L)=5.0\times 10^{-5}$ 3; $\alpha(M)=9.3\times 10^{-6}$ 5 $\alpha(N)=1.58\times 10^{-6}$ 9; $\alpha(IPF)=5.6\times 10^{-5}$ 4 Mult.: $A_2=-0.248$ 60, $A_4=-0.065$ 70.
1436.5	26.1 20	2269.0	(7/2 ⁺)	832.5	(9/2) ⁺	(M1)	5.72 $\times 10^{-4}$	$\alpha(K)=0.000455$ 7; $\alpha(L)=5.21\times 10^{-5}$ 8; $\alpha(M)=9.75\times 10^{-6}$ 14 $\alpha(N)=1.647\times 10^{-6}$ 23; $\alpha(IPF)=5.28\times 10^{-5}$ 8 Mult.: $A_2=-0.265$ 45, $A_4=+0.000$ 55.

[†] Doublet.

[‡] Authors assume that γ 's with measurable δ are M1+E2 and γ 's with mult=Q are E2, D are assumed M1.

[#] [Additional information 1](#).

[@] If No value given it was assumed $\delta=1.00$ for E2/M1, $\delta=1.00$ for E3/M2 and $\delta=0.10$ for the other multipolarities.

[&] Placement of transition in the level scheme is uncertain.

