

Energy levels and branching ratios [92Tu02, 99Ju03, 06Ab37].

⁹⁴Ru
44

E^*	J^π	L	ε	$T_{1/2}$ or	Ref.
[keV]		(d,p)	(d,p)	Γ_{cm}	
0.0*	0 ⁺	0	1.3	51.8(6) m	73Ba26
1430.7(2)*	2 ⁺	2	0.4		73Ba26
2186.6(3)*	4 ⁺				
2498.0(3)*	6 ⁺			65(2) ns	
2503.2(3)	$\langle 3-5 \rangle$				
2624.4(3)**	5 ⁻			0.53(+50-23) ns	
2644.1(4)*	8 ⁺			71(4) μ s	
2965(6)	$\langle 3- \rangle$				
2995(6)	0 ⁺	0	0.04		73Ba26
3117.0(4)	$\langle 3-5 \rangle$				
3177.7(4)	$\langle 3-5 \rangle$				
3254.7(4)	$\langle 3-5 \rangle$				
3520(7)					
3615(7)	0 ⁺	0	0.5		73Ba26
3657.6(4)**	$\langle 7- \rangle$				
3770(8)	0 ⁺	0	3.0		73Ba26
3820(8)					
3930.1(4)	$\langle 8+ \rangle$				99Ju03
3991.2(4)*	$\langle 10+ \rangle$				
4000(8)					
4197.3(4)**	$\langle 9 \rangle^-$				
4338.5(4)	$\langle 9 \rangle^-$				
4489.1(4)**	$\langle 11 \rangle^-$			0.78(12) ns	
4716.6(4)*	$\langle 12 \rangle^+$			35(3) ps	
5567.8(4)**	$\langle 13 \rangle^-$			6 ps	
6064.3(6)***					
6275.1(4)	$\langle 12+ \rangle$				99Ju03
6294.3(6)***					
6357.6(4)	$\langle 12+ \rangle$				99Ju03
6552.7(8)***					
6614.4(4)*	$\langle 13 \rangle^+$			5 ps	
6918.9(4)	$\langle 13 \rangle^-$				99Ju03
7157.6(4)*	$\langle 14 \rangle^+$				
7407.7(8)***					
7651.9(9)***					
7768.3(4)	$\langle 13 \rangle^-$				99Ju03
7773.1(4)*	$\langle 15 \rangle^+$				99Ju03
7909.9(4)	$\langle 15+ \rangle$				99Ju03
7970.0(4)	$\langle 14 \rangle^-$				99Ju03
8039.4(4)	$\langle 14+ \rangle$				99Ju03
8133.2(4)	$\langle 15 \rangle^-$				99Ju03
8152.3(4)	$\langle 14 \rangle^-$				99Ju03
8200.7(8)***					
8271.8(4)**	$\langle 14 \rangle^-$				99Ju03
8340.0(9)***					

(continued)

⁹⁴Ru
₄₄

E^*	J^π	L	ε	$T_{1/2}$ or	Ref.
[keV]		(d,p)	(d,p)	Γ_{cm}	
8411.2(4)*	$\langle 16 \rangle^+$				99Ju03
8501.5(4)**	$\langle 15 \rangle^-$				99Ju03
8736.7(4)	$\langle 15 \rangle^-$				99Ju03
8853.4(4)	$\langle 15^- \rangle$				99Ju03
8996.7(4)**	$\langle 16 \rangle^-$				99Ju03
9041.7(4)*	$\langle 17 \rangle^+$				99Ju03
9134.9(4)	$\langle 16 \rangle^-$				99Ju03
9254.2(4)	$\langle 17 \rangle^-$				99Ju03
9464.0(4)	$\langle 16^- \rangle$				99Ju03
9526.6(4)*	$\langle 18 \rangle^+$				99Ju03
9789.2(4)	$\langle 17 \rangle^-$				99Ju03
9921.0(4)*	$\langle 19 \rangle^+$				99Ju03
9928.6(4)**	$\langle 18 \rangle^-$				99Ju03
10129.4(4)	$\langle 17^- \rangle$				99Ju03
10444.3(4)	$\langle 19 \rangle^-$				99Ju03
10544.8(4)	$\langle 18^- \rangle$				99Ju03
11041.8(4)**	$\langle 20 \rangle^-$				99Ju03
11451.7(5)	$\langle 19^+ \rangle$				
12077.2(5)	$\langle 20^+, 21^+ \rangle$				
12429.6(5)	$\langle 20^+, 21^+ \rangle$				
12484.1(4)	$\langle 20^-, 21^- \rangle$				
12922.8(4)	$\langle 20^- \rangle$				
12940.0(5)	$\langle 20^+ \rangle$				
13053.4(5)	$\langle 22^- \rangle$				
13077.7(5)	$\langle 21^- \rangle$				
13247.0(5)	$\langle 20^+, 21^+ \rangle$				
13623.8(5)	$\langle 21^+ \rangle$				
13896.9(4)	$\langle 21^- \rangle$				
13917.0(5)	$\langle 23^-, 24^- \rangle$				
13938.8(4)	$\langle 21^-, 22^- \rangle$				
14226.7(5)	$\langle 21^- \rangle$				
14293.5(5)	$\langle 23^- \rangle$				
14674.8(5)	$\langle 21^-, 22^- \rangle$				
14805.7(4)	$\langle 21^-, 22^- \rangle$				
15289.4(4)	$\langle 22^-, 23^- \rangle$				
16767.4(5)	$\langle 24^-, 25^- \rangle$				
18321.4(5)	$\langle 25^- - 27^- \rangle$				
				73Ba26	Ref.

* The level of the cascade based on 0^+ [06Ab37].** The level of the cascade based on 5^- [06Ab37].

*** Absent in [06Ab37].

Enhancement factor $\varepsilon = \sigma_{\text{exp}} / 44\sigma_{\text{DWBA}}$ corresponds to spectroscopic factor [73Ba26, 85Mu05].

Energy levels and branching ratios [92Tu02, 99Ju03, 06Ab37]. Part 2

⁹⁴Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	0.0 0 ⁺	1430 2 ⁺	2187 4 ⁺	2498 6 ⁺	2625 5 ⁻	2644 8 ⁺	3658 7 ⁻	3992 10 ⁺	4198.3 9 ⁻	4489.9 11 ⁻
1430.7(2)*	2 ⁺		100									
2186.6(3)*	4 ⁺			100								
2498.0(3)*	6 ⁺				100							
2503.2(3)	3-5			100								
2624.4(3)**	5 ⁻				63(4)	37(4)						
2644.1(4)*	8 ⁺					100						
3117.0(4)	3-5						100					
3177.7(4)	3-5						100					
3254.7(4)	3-5				100							
3657.6(4)**	7 ⁻						100					
3991.2(4)*	10 ⁺							100				
4197.3(4)**	9 ⁻								100			
4489.1(4)**	11 ⁻									77(8)	23(3)	
4716.6(4)*	12 ⁺									100		
5567.8(4)**	13 ⁻											100

Energy levels and branching ratios [92Tu02, 99Ju03, 06Ab37]. Part 3

⁹⁴Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	4716.9 12 ⁺	5569.0 13 ⁻	6064.3	6294.3	6614.1 13 ⁺	7157.0 14 ⁺	7407.7	7651.9	7772.4
6064.3(6)***				100							
6294.3(6)***					100						
6552.7(8)***						100					
6614.4(4)*	13 ⁺		100								
7157.6(4)*	14 ⁺						100				
7407.7(8)***						100					
7651.9(9)***								100			
7773.1(4)*	15 ⁺							100			
7909.9(4)	15 ⁺						46(23)	36(12)		18(6)	
8200.7(8)***									100		
8411.2(4)*	16 ⁺										100

Energy levels and branching ratios [92Tu02, 99Ju03, 06Ab37]. Part 4

⁹⁴Ru₄₄

E^* [keV]	J^π	$E_f^*:$ $J_f^\pi:$	7908.8	Branching ratios in percentage			9525.7
				8200.7	8402.7	9040.9	
8340.0(9)***				100			
9041.7(4)*	$\langle 17 \rangle^+$				100		
9254.2(4)	$\langle 17 \rangle^-$		100				
9526.6(4)*	$\langle 18 \rangle^+$					100	
9921.0(4)*	$\langle 19 \rangle^+$						100

Energy levels and branching ratios [93Bu08].

⁹⁵Ru₄₄

E^* [keV]	$2J^\pi$	L	C^2S (p,d)	$2J^\pi$ (p,d)	$T_{1/2}$ or Γ_{cm}	Ref.
0.0	5^+	2	1.30	5^+	1.64(1) h	71Ba01
787.7(4)	1^+	0	0.07	1^+		71Ba01
890(5)						
941.8(3)	$7^{(+)}$	$\langle 4 \rangle$	0.32,0.2	$7^+, 9^+$		71Ba01
1141(5)	$3^+, 5^+$	2	0.26,0.2	$3^+, 5^+$		71Ba01
1352.0(2)	9^+	4	0.5,0.8	$9^+, 7^+$		71Ba01
1494.6(3)	$\langle 7, 9 \rangle$					
1524.0(3)	$\langle 7, 9 \rangle$					
1925.27(24)	$\langle 7, 9 \rangle$					
2029.77(25)	$13^{(+)}$					
2067	$\langle 11^+ \rangle$					
2117.0(4)	$9^+, 7^+$	4	5.0	9^+		71Ba01
2155.66(21)	$\langle 7, 9 \rangle$					
2246.9(3)	11^+					
2258.87(25)	$\langle 9, 11 \rangle^+$					
2268.2(3)	$\langle 7, 9 \rangle$					
2284.8(11)	$17^{(+)}$				3.05(28) ns	
2294(5)	$9^+, 7^+$	4	1.0	9^+		71Ba01
2431.1(3)	$\langle 9, 11 \rangle^+$					
2450	$\langle 11^- \rangle$					
2493	$\langle 13^- \rangle$					
2539.8(14)	$21^{(+)}$				10.05(14) ns	
2648						
2691.0(3)	$\langle 9, 11 \rangle$					
2695.8(3)	$\langle 9 \rangle$					
2713(5)	$1^-, 3^-$	1	1.2	1^-		71Ba01
2744	$\langle 15^+ \rangle$					
2774	$\langle 15^- \rangle$					
2902.23(24)	$\langle 7-11 \rangle^+$					
2961						
2991	$\langle 19^+ \rangle$					

(continued)

**⁹⁵Ru
44**

E^*	$2J^\pi$	L	C^2S	$2J^\pi$	$T_{1/2}$ or Γ_{cm}	Ref.
[keV]			(p,d)	(p,d)		
3057	$\langle 17^+ \rangle$					
3062.9(3)	$\langle 7,9 \rangle^+$					
3163.2(9)	$\langle 7,9 \rangle^+$					
3168						
3186.3(8)	$\langle 3 \rangle^-$	1	1.2,1.4	3-,1-		71Ba01
3214(5)	1-,3-	1	0.5,0.4	1-,3-		71Ba01
3370	$\langle 17^- \rangle$					
3383(5)	9+,7+	4	1.5	9+		71Ba01
3407.2(5)	$\langle 3 \rangle^-$					
3478**	17-					04Ga08
3551.2(3)	$\langle 7,9 \rangle^+$					
3577	$\langle 19^- \rangle$					
3655.8(7)	$\langle 7-11 \rangle^+$					
3686.7(9)	$\langle 7,9 \rangle^+$					
3702**	19-					04Ga08
3733.6(4)	$\langle 7,9 \rangle^+$					
3744.0(12)	$\langle 9,11 \rangle^+$					
3779.3(3)	$\langle 9 \rangle^+$					
3824.5(7)	$\langle 3 \rangle^-$					
3832	25 $\langle + \rangle$					
3975.8(8)	$\langle 7-11 \rangle^+$					
3983.5(5)	$\langle 7,9 \rangle^+$					
3985**	21-					04Ga08
4177.7(12)	$\langle 7,9 \rangle^+$					
4102**	23-					04Ga08
4504*	29+					04Ga08
4505**	25-					04Ga08
4744**	27-					04Ga08
5616**	29-					04Ga08
5774**	31-					04Ga08
6645*	$\langle 31^+ \rangle$					04Ga08
6770*	$\langle 33^+ \rangle$					04Ga08
6826*	$\langle 33^+ \rangle$					04Ga08
7063**	35-					04Ga08
7527**	33-					04Ga08
7531*	$\langle 35^+ \rangle$					04Ga08
7681**	35-					04Ga08
8106*	$\langle 37^+ \rangle$					04Ga08
8308**	35-					04Ga08
8705*	$\langle 39^+ \rangle$					04Ga08
8851*	$\langle 39^+ \rangle$					04Ga08
9344*	$\langle 41^+ \rangle$					04Ga08

(continued)

**⁹⁵Ru
44**

E^*	$2J^\pi$	L	C^2S	$2J^\pi$	$T_{1/2}$ or	Ref.
[keV]			(p,d)	(p,d)	Γ_{cm}	
12163*	$\langle 43^+ \rangle$		71Ba01	71Ba01		04Ga08 Ref.

Additional data on this isotope can be found in [04Ga08, 02Gr16, 90Go15, 71Ba01].

* New positive parity level [04Ga08].

** New negative parity level [04Ga08].

Energy levels and branching ratios [93Bu08]. Part 2

**⁹⁵Ru
44**

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]	(p,d)	E_f^* : $2J_f^\pi$:	0.0 5+	941.8 7 $\langle + \rangle$	1352 9+	1495 $\langle 7,9 \rangle$	1524 $\langle 7,9 \rangle$	2030 13 $\langle + \rangle$	2067 $\langle 11+ \rangle$	2156 $\langle 7,9 \rangle$	2246.9 11+	2258.87 $\langle 9,11 \rangle +$
787.7(4)	1+		100									
941.8(3)	7+,9+		100									
1352.0(2)	9+,7+		95(3)	4.9(6)								
1494.6(3)			100									
1524.0(3)			100									
1925.27(24)			63(6)				37(7)					
2029.77(25)					100							
2067					100							
2117.0(4)	9+			25(5)	34(6)	42(4)						
2155.66(21)			34(8)			66(5)						
2246.9(3)				51(3)	49(4)							
2258.87(25)				51(4)	10(1)			39(3)				
2268.2(3)			35(6)	65(6)								
2284.8(11)								100				
2431.1(3)				66(5)	26(3)			8.7(16)				
2450					x				x			
2493											x	
2691.0(3)				22(3)	25(5)			53(4)				
2695.8(3)			42(9)					58(8)				
2744											100	
2902.23(24)					44(7)		56(6)					
3062.9(3)			38(4)	62(4)								
3163.2(9)			19(4)	81(13)								
3186.3(8)	3-,1-		100									
3407.2(5)			100									
3551.2(3)			25(4)	47(5)								27(4)
3655.8(7)				44(10)								
3686.7(9)			26(6)		74(15)							
3733.6(4)			12.8(21)	87(5)								
3744.0(12)								54(22)		46(11)		
3779.3(3)			39(7)		21(5)			39(5)				

(continued)

⁹⁵₄₄Ru

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]	(p,d)	$E_f^*:$ $2J_f^\pi:$	0.0 5+	941.8 7(+)	1352 9+	1495 ⟨7,9⟩	1524 ⟨7,9⟩	2030 13(+)	2067 ⟨11+⟩	2156 ⟨7,9⟩	2246.9 11+	2258.87 ⟨9,11⟩+
3824.5(7)			100									
3975.8(8)				44(8)								56(14)
3983.5(5)			51(11)	49(5)								
4177.7(12)			24(8)	76(15)								

Energy levels and branching ratios [93Bu08]. Part 3

⁹⁵₄₄Ru

<i>E</i> [*]	2 <i>J</i> ^π	Branching ratios in percentage												
[keV]	(p,d)	<i>E</i> _f [*] : 2 <i>J</i> _f ^π :	2268.2 ⟨7,9⟩	2284.8 17⟨+⟩	2450 ⟨11−⟩	2493 ⟨13−⟩	2539.8 21⟨+⟩	2648	2744 ⟨15+⟩	2774 ⟨15−⟩	2961	3057 ⟨17+⟩	3168	3370 ⟨17−⟩
2493					x									
2539.8(14)				100										
2648				x			x							
2774						100								
2961								100						
2991									100					
3057										100				
3168											100			
3370												100		
3577				75(8)										25(7)
3655.8(7)			56(14)											
3832							x						x	

Energy levels and branching ratios [93Pe02].

⁹⁶₄₄Ru

E^*	J^π	$I_{s,0}$	τ	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		[eVb]	(γ, γ')	Γ_{cm}		E_f^* : J_f^π :	0.0 0 ⁺	832.6 2 ⁺	1518 4 ⁺	1931 2 ⁺	2150 6 ⁺
0.0	0 ⁺			Stable							
832.57(5)	2 ⁺			2.81(11) ps			100				
1518.06(12)	4 ⁺			6.9(9) ps				100			
1931.08(7)	2 ⁺			0.37(6) ps	02Kl07		6(1)	94			
2148.80(9)	0 ⁺			0.46(+63-18) ps				100			
2149.77(7)	6 ⁺								100		
2284.2(3)	2 ⁺						7(2)	93(3)			
2462.07(12)	4 ⁺			0.10(+5-3) ps	02Kl07				100		
2524.6(2)	3 ⁺ ,4 ⁺							85(2)	9(2)	6(2)	
2528.4(1)	1 ⁺ ,2 ⁺						23(3)	77(3)			
2576.1(2)	2 ⁺				02Kl07		30(3)	70(3)			

(continued)

⁹⁶Ru
₄₄

E^*	J^π	$I_{s,0}$	τ	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		[eVb]	(γ, γ')	Γ_{cm}		E_f^* : J_f^π :	0.0 0 ⁺	832.6 2 ⁺	1518 4 ⁺	1931 2 ⁺	2150 6 ⁺
2579.0(3)								63(5)		37(4)	
2588.4(2)	5 ⁻			≥ 2.8 ps					100		
2650.0(2)	3 ⁻				02Kl07			74(2)	12(2)	14(2)	
2700.1(2)	4 ⁺ , 5								x		
2739.8(2)	2 ⁺				02Kl07			31(2)		69(2)	
2760.2(1)	4 ⁺ , 5								100		
2793.84(15)	$\langle 5, 6 \rangle$				02Kl07				39(1)	1.6(5)	59(2)
2851.4(2)	2 ⁺ , 3			0.14(+10-5) ps				90		10(5)	
2891.64(16)	6 ⁺										100
2897.7(3)	3 ⁺				02Kl07			17(7)	31(6)	52(6)	
2950.4(2)	8 ⁺										100
2987.8(3)								100			
2996.4(2)	$\langle 2-4 \rangle$				02Kl07			76(8)	13(5)		
3060.5(2)	$\langle 1, 4 \rangle$				02Kl07			14(5)		69(5)	
3075.9(2)	3 ⁻								17(11)	56(16)	
3076.54(22)									100		
3090.2(2)				<0.13 ps	02Kl07		6(2)	94(6)			
3154.2	1 ⁽⁺⁾	95.2(30)	4.5(2) fs		05Li59						
3166.69(17)									100		
3210.1(3)								39(15)	61(9)		
3232.1(5)										100	
3260.98(20)	2 ⁺						6(1)	23(5)	71(11)	<9	
3281.3(3)	1	9.9(6)	71(5) fs		05Li59						
3291.0	7 ⁻										
3291.6(24)								42(6)	19(6)		
3306.72(18)									66(3)		≈ 13
3362.5(2)	4 ⁺			<0.4 ps	02Kl07						100
3377.53(16)									14(1)		67(4)
3380.47(17)											63(4)
3447.9	1	3.5(6)	182(31) fs		05Li59						
3479.6	1	12.4(8)	51(4) fs		05Li59						
3544.49(21)	$\langle 8^+ \rangle$										26(5)
3706.40(24)											66(3)
3742.84(20)									31(4)		47(5)
3755.13(25)											95(3)
3805.67(24)											65(7)
3816.7	10 ⁺										
3887.22(17)											85(4)
3950.6	9 ⁻										
4057.50(24)									55(4)		45(5)
4080.23(20)										7(2)	
4112.94(18)											75(4)
4148.1(6)											100
4210.8(4)											49(15)
4261.5											

(continued)

⁹⁶Ru
₄₄

<i>E</i> [*]	<i>J</i> ^π	<i>I</i> _{s,0}	<i>τ</i>	<i>T</i> _{1/2} or	Ref.	Branching ratios in percentage					
[keV]		[eVb]	(<i>γ</i> , <i>γ</i> ['])	<i>Γ</i> _{cm}		<i>E</i> _f [*] : <i>J</i> _f ^π :	0.0 0 ⁺	832.6 2 ⁺	1518 4 ⁺	1931 2 ⁺	2150 6 ⁺
4417.6	12 ⁺										
4520.98(18)											
4533.6	10 [−]										
4560.92(24)											
4592.5(6)											
4600.2											
4777.44(18)											6(2)
4798.0	9 [−]										
4865.3											
4949.54(23)									19(5)		10(3)
5273.5											
5533.3	⟨11 [−] ⟩										
5541.5(3)											
5679.8	14 ⁺										
5750.3	11 [−]										
5993.8											
6278.7	12 [−]										
6440.5	16 ⁺										
8203.3	⟨18 ⁺ ⟩										
9844	⟨22 ⁺ ⟩										
		05Li59	05Li59		93Re09 Ref.						

Additional data on this isotope can be found in [02Kl07, 01Pi12, 00Kh02, 93Re09].
Abundance: 5.54(14) %.
Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [93Pe02]. Part 2

⁹⁶Ru
₄₄

<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage										
[keV]		<i>E</i> _f [*] : <i>J</i> _f ^π :	2284 2 ⁺	2462 4,5 ⁺	2525 3 ⁺ ,4 ⁺	2588.4 5 [−]	2650.0 2 ⁺ ,3 [−]	2760.2 4 ⁺ ,5	2793.84	2891.64 6 ⁺	2897.7 3 ⁺ ,4 ⁺	2950.4 8 ⁺
2700.1(2)	4 ⁺ ,5			100								
2996.4(2)	⟨2−4⟩				11(4)							
3060.5(2)	⟨1,4⟩		17(5)									
3075.9(2)	3 [−]					18(5)	9(4)					
3291.0	7 [−]					100						
3291.6(24)					24(5)					15(3)		
3306.72(18)										21(3)		
3377.53(16)				8.8(5)	4.1(6)					4.3(6)		
3380.47(17)								13.5(4)		3.4(9)		20(2)
3544.49(21)	⟨8 ⁺ ⟩											56(6)
3706.40(24)								9(1)				
3755.13(25)										4.7(14)		

(continued)

⁹⁶Ru₄₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	2284 2 ⁺	2462 4,5 ⁺	2525 3 ⁺ ,4 ⁺	2588.4 5 ⁻	2650.0 2 ⁺ ,3 ⁻	2760.2 4 ⁺ ,5	2793.84	2891.64 6 ⁺	2897.7 3 ⁺ ,4 ⁺	2950.4 8 ⁺
3805.67(24)	10 ⁺								35(7)			
3816.7												100
3887.22(17)										15(1)		
4080.23(20)								25(5)		59(5)		
4112.94(18)						4.2(12)						20(3)
4210.8(4)								51(22)				
4520.98(18)				23(2)	77(4)							
4560.92(24)								49(5)				
4777.44(18)					13(2)					19(2)		
4949.54(23)				11(3)	15(3)					11(5)		

Energy levels and branching ratios [93Pe02]. Part 3

⁹⁶Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	3076.54 7 ⁻	3291.0 7 ⁻	3291.6	3306.72	3362.5	3377.53	3380.47	3544.49 <8 ⁺ >	3816.7 10 ⁺	3887.22
3377.53(16)	<8 ⁺ >		2.1(5)									
3544.49(21)						18(3)						
3706.40(24)				21(3)		4.5(11)						
3742.84(20)								22(7)				
3950.6	9 ⁻			100								
4080.23(20)									9.1(31)			
4261.5	12 ⁺										100	
4417.6											100	
4560.92(24)					32(4)					19(5)		
4592.5(6)										100		
4777.44(18)			14(2)			23(5)		6(2)				20(2)
4949.54(23)						34(4)						
5541.5(3)								100				

Energy levels and branching ratios [93Pe02]. Part 4

⁹⁶Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	3950.6 9 ⁻	4261.5	4417.6 12 ⁺	4533.6 10 ⁻	4798.0 9 ⁻	5533.3 <11 ⁻ >	5679.8 14 ⁺	5750.3 11 ⁻	6440.5 16 ⁺
4533.6	10 ⁻		100								
4600.2	9 ⁻			100							
4798.0			100								
4865.3					100						

(continued)

⁹⁶Ru
44

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	3950.6 9 ⁻	4261.5	4417.6 12 ⁺	4533.6 10 ⁻	4798.0 9 ⁻	5533.3 (11 ⁻)	5679.8 14 ⁺	5750.3 11 ⁻	6440.5 16 ⁺
5273.5							100				
5533.3	(11 ⁻)					100					
5679.8	14 ⁺				100						
5750.3	11 ⁻						100				
5993.8							100				
6278.7	12 ⁻							53(21)		47(25)	
6440.5	16 ⁺								100		
8203.3	(18 ⁺)										100

Energy levels and branching ratios [93Ar09].

⁹⁷Ru
44

E^*	$2J^\pi$	L	$(2J+1)S$	I_p	$G_{\ell j}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,p)	arb.u	(d,p)	Γ_{cm}		E_f^* : $2J_f^\pi$:	0.0 5 ⁺	189.2 3 ⁺	421 7 ⁺	528 3 ⁺	611
0.0	5 ⁺	2	3.43	590	3.88	2.791(1) d	77Me04						
189.22(6)	3 ⁺				<0.07	0.23(4) ns			100				
421.54(5)	7 ⁺	4	4.84	40	4.13	34.6(21) ps	77Ho02		100				
527.84(5)	3 ⁺	2	0.75	110	0.73		77Ho02		82(4)	18(4)			
610.79(8)	⟨1 ⁺ –5 ⁺ ⟩								4.1(6)	96(12)			
771.38(8)	3 ⁺	2	0.13	20			77Ho02		66(3)	34(3)			
840.19(7)	7 ⁺								93	7.5(1)			
879.77(7)	⟨9⟩ ⁺								92(2)		7.9(9)		
908.28(7)	1 ⁺	0	1.15	40	1.48		77Ho02		38(3)	56(3)			6(3)
1184.54(9)	3 ⁺ ,5 ⁺	2	0.30		0.30		77Ho02		52(4)	45(3)			
1199.0(2)	⟨11⟩ ⁺					3.5(7) ps					80(7)		
1229.43(8)	⟨9⟩ ⁺								29(2)		38(3)		
1376.9(1)									17(2)	69(19)			
1477(7)	3 ⁺ ,5 ⁺	2	0.8,0.7	150	1.13		77Ho02						
1543.0(2)	⟨7–11 ⁺ ⟩												
1595.6(10)													
1619.6(3)	⟨11⟩ ⁺										61(3)		
1826.1(3)	⟨13⟩ ⁺												
1845.5(2)	⟨15⟩ ⁺					15(2) ps							
1879.3(3)	11 [–]	5	6.78	80	6.50		77Ho02						
1929(7)	3 ⁺ ,5 ⁺	2	0.5,0.4	80	0.60		77Ho02						
1932.3(1)	7 ⁺								15(3)	6(2)	15(3)		
1990.1(2)	⟨7⟩								29(9)				
1998.6(3)	7 ⁺ –11 ⁺										45(7)		
2005(7)													
2020.0(8)													
2080(7)				30									
2150.9(5)	7 ⁺									5(5)	9(5)		

(continued)

⁹⁷Ru
₄₄

E^*	$2J^\pi$	L	$(2J+1)S$	I_p	$G_{\ell j}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,p)	arb.u	(d,p)	Γ_{cm}		E_f^* : $2J_f^\pi$:	0.0 5 ⁺	189.2 3 ⁺	421 7 ⁺	528 3 ⁺	611
2173(7)	1 ⁺	0	0.12	40			77Ho02						
2197.7(1)	3 ⁻								3.2(4)	18(1)			38(2)
2245.9(2)	3 ⁻								71			13(1)	
2284(7)	1 ⁺	0	0.23	130	0.25		77Ho02						
2300.7(6)	1,3									74(10)			
2312.8(2)	1 ⁻ ,3 ⁻									67(5)		33(3)	
2350(7)	[3 ⁺]	2	0.19	60	0.36		77Ho02						
2506(7)	1 ⁺	0	0.13	70			77Ho02						
2545.2(3)	$\langle 17^+ \rangle$					<3.5 ps							
2552.9(8)	$\langle 15^- \rangle$												
2564.9(2)	3 ⁻								2(1)	11(1)		30(7)	
2576.0(5)	1 ⁻ ,3 ⁻								23(5)				77(8)
2591.4(4)	7 ⁺ -11 ⁺												
2596.2(4)	$\langle 15^- \rangle$												
2599.1(11)	$\langle 17^+ \rangle$												
2605(7)													
2640.7(5)	$\langle 17^+ \rangle$												
2647.8(2)	3 ⁻								46(4)	2(1)			16(4)
2652(7)	1 ⁺	0	0.10	50			77Ho02						
2702(7)	1 ⁺	0	0.15	80			77Ho02						
2738.8(4)	$\langle 21^+ \rangle$					7.8(2) ns							
2742.9(11)	$\langle 17^+ \rangle$												
2754.7(4)	7 ⁺								21(11)	15(11)			
2759.1(4)	$\langle 19^+ \rangle$												
2760.4(5)	7 ⁺ -11 ⁺											42(10)	
2764.78(22)	1 ⁻ ,3 ⁻									9(2)		28(5)	36(5)
2766.2(5)	7 ⁺ -11 ⁺												
2797.1(4)	1 ⁻ ,3 ⁻									83(9)			
2929.77(22)	3 ⁻								36(8)				8(5)
2966.4(6)	7 ⁺									22(14)			
3030(7)	3 ⁺ ,5 ⁺	2	0.4,0.3	110			77Ho02						
3227	$\langle 19^- \rangle$						98Fo08						
3264.9(4)	3 ⁻								[17]	[33]		[33]	
3269.5(5)	$\langle 19^- \rangle$												
3296.1(6)	1 ⁻ ,3 ⁻									49(9)		51(17)	
3368.8(6)	7 ⁺ -11 ⁺										100		
3374.8(4)	3 ⁻								64(7)	10(2)			
3458.9(6)	3 ⁻								86(17)	14(9)			
3481.2(15)	$\langle 21^+ \rangle$												
3620.7(5)	$\langle 23^+ \rangle$												
3669.3(8)	$\langle 25^+ \rangle$												
3940.8(5)	[23 ⁻]						98Fo08						
4097	$\langle 27^- \rangle$						98Fo08						
4262.4(8)	$\langle 27^+ \rangle$												
4729.2(8)	$\langle 29^+ \rangle$												

(continued)

⁹⁷Ru₄₄

E^*	$2J^\pi$	L	$(2J+1)S$	I_p	$G_{\ell j}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,p)	arb.u	(d,p)	Γ_{cm}		E_f^* : $2J_f^\pi$:	0.0 5 ⁺	189.2 3 ⁺	421 7 ⁺	528 3 ⁺	611
5493	$\langle 31^- \rangle$						98Fo08						
6317	$\langle 35^- \rangle$						98Fo08						
10203	$\langle 53^+ \rangle$						93Re09						
			77Ho02		77Me04		Ref.						
				77Ho02			Ref.						

Additional data on this isotope can be found in [00Kh02, 98Kh01, 93Re09].

Proton yield in the (d,p) reaction (in counts of puls-height spectra [77Ho02]) corresponds to measurements at an incident deuteron energy of 11.5 MeV and laboratory angle of 25°.

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [93Ar09]. Part 2

⁹⁷Ru₄₄

E^*	$2J^\pi$	Branching ratios in percentage											
[keV]		E_f^* : $2J_f^\pi$:	771 3 ⁺	840 7 ⁺	880 (9) ⁺	908.3 1 ⁺	1184.5 3 ⁺ ,5 ⁺	1199.0 (11) ⁺	1229.4 (9) ⁺	1376.9	1619.6 (11) ⁺	1826.1 (13) ⁺	
1184.54(9)	3 ⁺ ,5 ⁺		3(2)										
1199.0(2)	(11) ⁺				20(3)								
1229.43(8)	(9) ⁺			22(2)	11(2)								
1376.9(1)			13(2)										
1543.0(2)	$\langle 7-11^+ \rangle$			88(22)	12(7)								
1595.6(10)					x								
1619.6(3)	(11) ⁺				39(2)								
1826.1(3)	(13) ⁺				100								
1845.5(2)	(15) ⁺							100					
1879.3(3)	11 ⁻				70			30(2)	x				
1932.3(1)	7 ⁺			15(2)	40(3)				8(4)				
1990.1(2)	(7)				71(9)								
1998.6(3)	7 ⁺ -11 ⁺			55(5)									
2020.0(8)								x			x		
2150.9(5)	7 ⁺			69(9)	17(3)								
2197.7(1)	3 ⁻		11(1)				26(2)			3.5(3)			
2245.9(2)	3 ⁻		8.5(8)			4.7(4)	1.4(6)			2.0(4)			
2300.7(6)	1,3						26(13)						
2552.9(8)	(15) ⁻											38(5)	
2564.9(2)	3 ⁻					20(2)				20(6)			
2591.4(4)	7 ⁺ -11 ⁺			37(8)	36(7)			26(7)					
2599.1(11)	(17 ⁺)											100	
2640.7(5)	(17) ⁺											100	
2647.8(2)	3 ⁻		2.1(7)			16(3)	17(1)						
2754.7(4)	7 ⁺				43(11)								
2760.4(5)	7 ⁺ -11 ⁺			25(17)	33(17)								
2766.2(5)	7 ⁺ -11 ⁺			69(22)	31(15)								

(continued)

⁹⁷Ru₄₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	771 3 ⁺	840 7 ⁺	880 ⟨9⟩ ⁺	908.3 1 ⁺	1184.5 3 ⁺ ,5 ⁺	1199.0 ⟨11⟩ ⁺	1229.4 ⟨9⟩ ⁺	1376.9	1619.6 ⟨11⟩ ⁺	1826.1 ⟨13⟩ ⁺
2797.1(4)	1 ⁻ ,3 ⁻					<13				9(2)		
3264.9(4)	3 ⁻		[17]									

Energy levels and branching ratios [93Ar09]. Part 3

⁹⁷Ru₄₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1845.5 ⟨15⟩ ⁺	1879.3 11 ⁻	1990.1 ⟨7⟩	1998.6	2197.7 3 ⁻	2245.9 3 ⁻	2312.8 1 ⁻ ,3 ⁻	2545.2 ⟨17 ⁺ ⟩	2596.2 ⟨15⟩ ⁻	2599.1 ⟨17 ⁺ ⟩
2545.2(3)	⟨17 ⁺ ⟩		100									
2552.9(8)	⟨15⟩ ⁻			62(5)								
2564.9(2)	3 ⁻						6(1)		11(1)			
2596.2(4)	⟨15⟩ ⁻			100								
2738.8(4)	⟨21 ⁺ ⟩									100		
2742.9(11)	⟨17 ⁺ ⟩	x										
2754.7(4)	7 ⁺				21(11)							
2759.1(4)	⟨19⟩ ⁺		78(8)							22(4)		
2764.78(22)	1 ⁻ ,3 ⁻						27(3)					
2797.1(4)	1 ⁻ ,3 ⁻							8(2)				
2929.77(22)	3 ⁻						25(3)	17(5)	14(5)			
2966.4(6)	7 ⁺					78(28)						
3269.5(5)	⟨19 ⁻ ⟩										100	
3374.8(4)	3 ⁻								12(5)			
3481.2(15)	⟨21 ⁺ ⟩											100

Energy levels and branching ratios [93Ar09]. Part 4

⁹⁷Ru₄₄

E^*	$2J^\pi$	Branching ratios in percentage							
[keV]		E_f^* : $2J_f^\pi$:	2640.7 $\langle 17 \rangle^+$	2738.8 $\langle 21 \rangle^+$	2759.1 $\langle 19 \rangle^+$	2797.1 $1^-, 3^-$	3620.7 $\langle 23 \rangle^+$	3669.3 $\langle 25 \rangle^+$	4262.4 $\langle 27 \rangle^+$
2738.8(4)	$\langle 21^+ \rangle$		x						
3374.8(4)	3^-					14(4)			
3620.7(5)	$\langle 23 \rangle^+$			68(7)	32(3)				
3669.3(8)	$\langle 25 \rangle^+$			100					
3940.8(5)	$[23^-]$			x					
4262.4(8)	$\langle 27 \rangle^+$						x	100	
4729.2(8)	$\langle 29 \rangle^+$								100

Energy levels and branching ratios [03Si07].

⁹⁸Ru
₄₄

E^*	J^π	L	S_N	$T_{1/2}$ or	Ref.	E_f^* :	Branching ratios in percentage			
[keV]			(d,t)	Γ_{cm}		J_f^π :	0.0	652	1398	1414
							0 ⁺	2 ⁺	4 ⁺	2 ⁺
0.0	0 ⁺	2	0.339(7)	Stable	02Ro34					
652.44(4)	2 ⁺	2	0.130(3)	5.5(8) ps	02Ro34		100			
1322.14(6)	0 ⁺							100		
1397.82(5)	4 ⁺	2	0.127(6)	8(2) ps	02Ro34			100		
		+0	0.012(2)		02Ro34					
1414.29(4)	2 ⁺			1.2(4) ps			33(1)	67(1)		
1796.96(5)	3 ⁺	2	0.009(5)		02Ro34			75(5)	5(1)	20(1)
		+0	0.004(1)		02Ro34					
1817.22(6)	$\langle 2 \rangle^+$	2	0.120(3)		02Ro34		28(2)	72(5)		
1953.4(3)	$\langle 3 \rangle^+$							100		
2012.70(5)	3 ⁺	$\langle 2 \rangle$	0.036(3)		02Ro34			8(1)	48(6)	44(5)
2222.51(7)	6 ⁺	$\langle 4 \rangle$	0.12(2)	4.3(5) ps	02Ro34				100	
2241.4(3)	$\langle 4^+ - 6^+ \rangle$								100	
2245.9(3)	$\langle 2^+, 3^+ \rangle$	$\langle 2 \rangle$	0.054(5)		02Ro34			100		
		$\langle +0 \rangle$	0.006(1)		02Ro34					
2266.50(6)	4 ⁺								18(3)	
2276.8(3)	$\langle 2^+ \rangle$	2	0.675(15)		02Ro34			100	<56	
2285(10)	$\langle 4^+ \rangle$									
2365(2)										
2374.5(10)	$\langle 0^+ - 4^+ \rangle$							x		
2409(2)	$\langle \leq 5 \rangle^{\langle + \rangle}$	$\langle 2 \rangle$	0.018(2)		02Ro34					
2427.14(16)	$\langle 2^+ \rangle$	$\langle 2 \rangle$	0.105(6)		02Ro34			75(8)	13(4)	
		$\langle +0 \rangle$	0.011(2)		02Ro34					
2430.2(3)									x	
2435(10)	$\langle 3^- \rangle$									
2467.6(10)	$\langle 2 \rangle^+$	0	0.0099(8)		02Ro34		16(2)			
2473.8(5)										
2546.99(7)	$\langle 5, 6 \rangle^+$								82(7)	
2602.3(3)	$\langle 2 - 5 \rangle^{\langle + \rangle}$	$\langle 2 \rangle$	0.060(4)		02Ro34				57(29)	
2619.8(5)	$\langle 1, 2 \rangle$						10(1)	90(8)		
2656.52(7)	$\langle 5^- \rangle$								100	
2659.62(7)	$\langle 3^+, 4 \rangle$									
2720.3(3)	$\langle 3 \rangle$								100	
2809.2(2)	$\langle 2^+ \rangle$									
2867.7(2)	$\langle 6^+ \rangle$									
3020(5)	$\langle \leq 5 \rangle^{\langle + \rangle}$	$\langle 2 \rangle$	0.040(3)		02Ro34					
3046(5)	$2^+, 3^+$	0	0.022(1)		02Ro34					
3064.9(3)	$\langle 3^+ \rangle$								100	
3069.3(7)										
3069.4(11)		$\langle 2 \rangle$	0.024(6)		02Ro34			100		
		$\langle +0 \rangle$	0.020(2)		02Ro34					
3126.31(9)	8 ⁺			14(2) ps						
3178.8(6)	$\langle 1, 2 \rangle$						31(3)	63(4)		6(1)
3190.20(9)	$\langle 8^+ \rangle$									
3205.5(8)	$\langle 1, 2, 3 \rangle$							61(7)		39(5)

(continued)

⁹⁸Ru
44

E^* [keV]	J^π	L	S_N (d,t)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage				
						$E_f^*:$ $J_f^\pi:$	0.0 0 ⁺	652 2 ⁺	1398 4 ⁺	1414 2 ⁺
3245.4(3)	$\langle 6^+ \rangle$									
3250.9(3)										
3283.51(20)	$\langle 7^- \rangle$									
3284(5)	$\langle 2^+, 3^+ \rangle$	$\langle 0 \rangle$	0.013(1)		02Ro34					
3366.8(10)							100			
3441.3(6)	$2^+, 3^+$	0	0.045(2)		02Ro34					
3537.0(7)										
3538.4(2)	$\langle 6^+, 8^+ \rangle$									
3579.7(5)	$\langle 7^-, 8^+ \rangle$									
3851.6(2)	9^-			≤ 6.0 ps						
4001.3(3)	10^+			14.3(21) ps						
4006.0(3)	$\langle 8-10 \rangle^+$									
4223.3(3)	$\langle 10^+ \rangle$									
4673.0(5)	11^-			6.4(5) ps						
4846.5(5)	X^+									
4914.6(6)	12^+									
4988.8(5)	$\langle 12^+ \rangle$									
5521.2(7)	13^-			4.6(4) ps						
5819.4(7)	14^+									
5888.6(7)										
6591.2(8)	15^-			3.1(8) ps						
6869.6(8)	16^+									
7623.4(9)	17^-			1.46(14) ps						
8449.5(10)	19^-									
9930.7(10)	21^-									
11006.5(11)	$\langle 22^- \rangle$									
11405.2(11)	23^-									
12282.3(12)	25^-									
14475.2(16)										
15499.4(16)										
17237.4(19)										
			02Ro34		Ref.					

Additional data on this isotope can be found in [03ReZY, 02Ro34, 00Ti07, 00Kh02, 93Re09, 81Du06].

Abundance: 1.87(3) %.

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [03Si07]. Part 2

⁹⁸Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	1797 3 ⁺	1817 ⟨2 ⁺ ⟩	2013 3 ⁺	2223 6 ⁺	2266.50 4 ⁺	2276.8 ⟨2 ⁺ ⟩	2546.99 ⟨5,6⟩ ⁺	2656.52 ⟨5 ⁻ ⟩	3126.31 8 ⁺
2266.50(6)	4 ⁺		68(5)		15(1)						
2427.14(16)	⟨2 ⁺ ⟩		5(1)	7(1)							
2467.6(10)	⟨2 ⁺ ⟩		84(8)								
2473.8(5)								x			
2546.99(7)	⟨5,6⟩ ⁺					18(2)					
2602.3(3)	⟨2-5⟩ ^{⟨+⟩}				43(14)						
2659.62(7)	⟨3 ⁺ ,4⟩	100									
2809.2(2)	⟨2 ⁺ ⟩	44(12)					56(19)				
2867.7(2)	⟨6 ⁺ ⟩					31(6)			69(12)		
3069.3(7)						78(22)			22(12)		
3126.31(9)	8 ⁺					100					
3190.20(9)	⟨8 ⁺ ⟩					100					
3245.4(3)	⟨6 ⁺ ⟩						100				
3250.9(3)							100				
3283.51(20)	⟨7 ⁻ ⟩					78(8)				22(3)	
3441.3(6)	2 ⁺ ,3 ⁺			56(6)	44(4)						
3537.0(7)				100							
3538.4(2)	⟨6 ⁺ -8 ⁺ ⟩								55(7)		45(3)
3579.7(5)	⟨7 ⁻ ,8 ⁺ ⟩					x			x		
3851.6(2)	9 ⁻										88
4001.3(3)	10 ⁺										68(5)
4006.0(3)	⟨8-10⟩ ⁺										46(4)
4223.3(3)	⟨10 ⁺ ⟩										46(4)

Energy levels and branching ratios [03Si07]. Part 3

⁹⁸Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	3190.20 ⟨8 ⁺ ⟩	3283.51 ⟨7 ⁻ ⟩	3284 ⟨2 ⁺ ,3 ⁺ ⟩	3538.42	3579.7 ⟨7 ⁻ ,8 ⁺ ⟩	3851.59 9 ⁻	4001.3 10 ⁺	4006.0	4673.0 11 ⁻
3579.7(5)	⟨7 ⁻ ,8 ⁺ ⟩				x						
3851.6(2)	9 ⁻	4			2	4	4				
4001.3(3)	10 ⁺	32(3)									
4006.0(3)	⟨8-10⟩ ⁺			54(4)							
4223.3(3)	⟨10 ⁺ ⟩	54(4)									
4673.0(5)	11 ⁻							100			
4846.5(5)	X ⁺									100	
4914.6(6)	12 ⁺								100		
4988.8(5)	⟨12 ⁺ ⟩								100		
5521.2(7)	13 ⁻										100

Energy levels and branching ratios [03Si07]. Part 4

⁹⁸Ru₄₄

E^*	J^π	Branching ratios in percentage									
[keV]		$E_f^*:$ $J_f^\pi:$	4914.6 12 ⁺	4988.8 ⟨12 ⁺ ⟩	5521.2 13 [−]	5819.4 14 ⁺	6591.2 15 [−]	7623.4 17 [−]	8449.5 19 [−]	9930.7 21 [−]	11006.5 ⟨22 [−] ⟩
5819.4(7)	14 ⁺		58	42							
5888.6(7)				100							
6591.2(8)	15 [−]				100						
6869.6(8)	16 ⁺					100					
7623.4(9)	17 [−]						100				
8449.5(10)	19 [−]							100			
9930.7(10)	21 [−]								100		
11006.5(11)	⟨22 [−] ⟩									100	
11405.2(11)	23 [−]									56(6)	44(6)

Energy levels and branching ratios [03Si07]. Part 5

⁹⁸Ru₄₄

E^* [keV]	J^π	Branching ratios in percentage			
		$E_f^*:$ $J_f^\pi:$	11405.2 23 ⁻	12282.3 25 ⁻	14475.2 15499.4
12282.3(12)	25 ⁻		100		
14475.2(16)				100	
15499.4(16)					100
17237.4(19)					100

Energy levels and branching ratios [94Pe15].

⁹⁹Ru₄₄

E^*	$2J^\pi$	L	σ (d,t)	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(d,t)	$\mu\text{b/sr}$	(d,t)	Γ_{cm}		$E^*_{\text{f}}:$ $2J^\pi_{\text{f}}:$	0.0 5 ⁺	89.7 3 ⁺	322 $\langle 3 \rangle^+$	341 7 ⁺	443 $\langle 3 \rangle^+$
0.0	5 ⁺	2	4200(300)	1.8	Stable	94Du08						
89.68(5)	3 ⁺	$\langle 2 \rangle$	77(13)	0.037	20.5(1) ns	94Du08		100				
322.38(6)	$\langle 3 \rangle^+$	2	320(30)	0.25		94Du08		93(2)	7.3(6)			
340.73(10)	7 ⁺	4	190(20)	1.8		94Du08		99(1)	0.71(5)			
442.71(6)	$\langle 3 \rangle^+$	0	840(100)	0.13	11(3) ps	94Du08		6.1(10)	94(3)			
575.89(11)	$\langle 5 \rangle^+$		28(9)		1.1(3) ps	94Du08		37(1)	63(1)			
617.62(13)	7 ⁺				0.7(3) ps			74	17(2)		9(1)	
618.04(6)	$\langle 1 \rangle^+$	0	760(100)	0.16	1.04(8) ns	94Du08		9(1)	83(13)	2.9(3)		4.4(3)
719.85(12)	9 ⁺	4	83(8)	0.55	2.25(25) ps	94Du08		96.2(4)			2.5(4)	
734.13(19)	$\langle 5 \rangle^+$		120(20)			94Du08		70.2(6)	23(1)	7(1)		
896.93(9)	$\langle 1^+, 3, 5^+ \rangle$	2	115(10)	0.06	<0.15 ns	94Du08		41(6)	59(4)			
998.74(15)	$\langle 1^+, 3, 5^+ \rangle$		50(17)			94Du08		94	5.8			
1048.6(1)	11 ⁺				4.6(25) ps						92(2)	
1069.9(2)	11 ⁻	$\langle 5 \rangle$	34(10)	$\langle 0.55 \rangle$	2.8(2) ns	94Du08					5.6(4)	

(continued)

⁹⁹Ru
₄₄

E^*	$2J^\pi$	L	σ (d,t)	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(d,t)	$\mu\text{b/sr}$	(d,t)	Γ_{cm}		E_{f}^* : $2J_{\text{f}}^\pi$:	0.0 5 ⁺	89.7 3 ⁺	322 $\langle 3 \rangle^+$	341 7 ⁺	443 $\langle 3 \rangle^+$
1093*	5 ⁺ ,3 ⁺	2	260(30)	0.24,0.3		94Du08						
1118.5(6)	7 ⁽⁺⁾							30(1)	34(1)			
1200.7(6)	5 ⁺							65(1)			23(2)	
1261.2(2)	7 ⁺							86(1)	0.8(3)		5.8(3)	
1277.7(2)	9 ⁺							2.4(7)			47(1)	
1290.78	7 ⁻							100				
1306.1(4)	$\langle 3^+,5,7^+ \rangle$							18(6)		36(11)		
1319.8(6)	11 ⁺				2.5(11) ps							
1383.2(1)	$\langle 1^+,3 \rangle$							4(2)	16(2)	12(2)		68(6)
1407.2					0.21(10) ps						100	
1414.25(2)	$\langle 1,3,5^+ \rangle$								78(11)			
1473.7	$\langle 7,5 \rangle$				0.18(11) ps							
1497.3(2)	13 ⁺				0.6(3) ps							
1499.2(5)	9 ⁺				0.25(11) ps			16(5)			43.1(4)	
1531.7(1)	$\langle 1^+,3 \rangle$							48(3)	5(2)	17(2)		30(3)
1572.1(3)	15 ⁻											
1583.0(10)	$\langle 7,5 \rangle$				0.14(5) ps						100	
1662.1(2)	$\langle 1^+,3 \rangle$							26(6)	74(8)			
1685.17	7 ⁺											
1711.4												
1717.5(11)	9 ⁻											
1749.9(3)	$\langle 1^+,3 \rangle$							100				
1822.7											100	
1847.0(10)	$\langle 11^+ \rangle$				0.32(11) ps							
1861.8(11)	13 ⁻				0.49(18) ps							
1898.8												
1944.5(11)	11 ⁻											
1966.1	13 ⁺											
1975.7(2)												
2020.9(2)	15 ⁺				0.35(14) ps							
2059.4(1)	$\langle 3^- \rangle$							4(1)	26(33)			35(4)
2112.6												
2168.5	$\langle 7 \rangle$											
2223.8	$\langle 13,9 \rangle$											
2254.7	$\langle 19^- \rangle$											
2269.0(3)	19 ⁻											
2383.1	9 ⁽⁺⁾				0.09(4) ps							
2393.2(3)	$\langle 17^- \rangle$				0.18(7) ps							
2401.2(3)	17 ⁺				0.63(28) ps							
2411.8												
2875.0(4)	$\langle 19^+ \rangle$											
3020	$\langle 21^+ \rangle$											
3037.4(4)	$\langle 19^- \rangle$				0.35(14) ps							
3201.2(4)	23 ⁻											
3207.9	$\langle 23^- \rangle$											

(continued)

⁹⁹Ru
44

E^*	$2J^\pi$	L	σ (d,t)	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(d,t)	$\mu\text{b/sr}$	(d,t)	Γ_{cm}		$E_{\text{f}}^*:$ $2J_{\text{f}}^\pi:$	0.0 5 ⁺	89.7 3 ⁺	322 $\langle 3 \rangle^+$	341 7 ⁺	443 $\langle 3 \rangle^+$
3354												
3460.2(4)	$\langle 17 \rangle^+$											
3484.2(4)	$\langle 21^+ \rangle$											
3640	$\langle 23^+ \rangle$											
3985.1(4)												
4224.3(5)	$\langle 27^- \rangle$											
4324.2(5)												
5170.2(5)												
5359.3(5)	$\langle 31^- \rangle$											
6479	$\langle 35^- \rangle$											
7563	$\langle 39^- \rangle$											
8738	$\langle 43^- \rangle$											
10027	$\langle 47^- \rangle$											
11425	$\langle 51^- \rangle$											
			94Du08	94Du08		Ref.						

Additional data on this isotope can be found in [03ReZY, 00Ti07, 98Fo08, 93Gi02, 81Du06].

Abundance: 12.76(14) %.

* Possible doublet [94Du08].

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [94Pe15]. Part 2

⁹⁹Ru
44

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	576 $\langle 5 \rangle^+$	618 7 ⁺	618 $\langle 1 \rangle^+$	719.85 9 ⁺	734.13 $\langle 5 \rangle^+$	1048.62 11 ⁺	1069.93 11 ⁻	1200.7 5 ⁺	1319.8 11 ⁺	1497.29 13 ⁺
719.85(12)	9 ⁺				1.35(10)							
1048.6(1)	11 ⁺				<6	8.3(9)						
1069.9(2)	11 ⁻					94.4(10)						
1118.5(6)	7 $\langle + \rangle$		36(1)									
1200.7(6)	5 ⁺						12(3)					
1261.2(2)	7 ⁺		7(1)	0.9(3)								
1277.7(2)	9 ⁺		3.6(9)		15(2)	4.3(9)	27.8(10)					
1306.1(4)	$\langle 3^+, 5, 7^+ \rangle$			47(8)								
1319.8(6)	11 ⁺			67(1)		25.4(11)		7.3(5)				
1414.25(2)	$\langle 1, 3, 5^+ \rangle$				22(11)							
1473.7	$\langle 7, 5 \rangle$		100									
1497.3(2)	13 ⁺					93(13)		7.1(8)			<2.5	
1499.2(5)	9 ⁺					41(11)						
1572.1(3)	15 ⁻								100			
1685.17	7 ⁺					100						
1711.4						100						
1717.5(11)	9 ⁻								100			

(continued)

⁹⁹Ru
44

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	576 $\langle 5 \rangle^+$	618 7^+	618 $\langle 1 \rangle^+$	719.85 9^+	734.13 $\langle 5 \rangle^+$	1048.62 11^+	1069.93 11^-	1200.7 5^+	1319.8 11^+	1497.29 13^+
1847.0(10)	$\langle 11^+ \rangle$					100						
1861.8(11)	13^-								100			
1898.8										100		
1944.5(11)	11^-								100			
1966.1	13^+							100				
1975.7(2)						100						
2020.9(2)	15^+							100				
2059.4(1)	$\langle 3^- \rangle$		26(5)	9(3)								
2112.6								100				
2168.5	$\langle 7 \rangle$					100						
2223.8	$\langle 13, 9 \rangle$										x	
2383.1	$9^{(+)}$							100				
2401.2(3)	17^+											100
2411.8								100				

Energy levels and branching ratios [94Pe15]. Part 3

⁹⁹Ru
44

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1572.1 15^-	1583.0 $\langle 7, 5 \rangle$	2020.91 15^+	2254.7 $\langle 19^- \rangle$	2269.0 19^-	2393.2 $\langle 17^- \rangle$	2401.2 17^+	2875.0 $\langle 19^+ \rangle$	3020 $\langle 21^+ \rangle$	3037.4 $\langle 19^- \rangle$
2254.7	$\langle 19^- \rangle$		100									
2269.0(3)	19^-		100									
2393.2(3)	$\langle 17^- \rangle$		100									
2875.0(4)	$\langle 19^+ \rangle$				x				x			
3020	$\langle 21^+ \rangle$								x	x		
3037.4(4)	$\langle 19^- \rangle$						65(12)	35(12)				
3201.2(4)	23^-						100					
3207.9	$\langle 23^- \rangle$					100						
3354				100								
3460.2(4)	$\langle 17 \rangle^+$								100			
3484.2(4)	$\langle 21^+ \rangle$								100			
3640	$\langle 23^+ \rangle$									x	x	
3985.1(4)												100

Energy levels and branching ratios [94Pe15]. Part 4

⁹⁹Ru₄₄

E^*	$2J^\pi$	E_f^* :	3201.2	3207.9	4224.3	5359.3	6479	7563	8738	10027
[keV]		$2J_f^\pi$:	23^-	$\langle 23^- \rangle$	$\langle 27^- \rangle$	$\langle 31^- \rangle$	$\langle 35^- \rangle$	$\langle 39^- \rangle$	$\langle 43^- \rangle$	$\langle 47^- \rangle$
4224.3(5)	$\langle 27^- \rangle$		100							
4324.2(5)				100						
5170.2(5)					100					
5359.3(5)	$\langle 31^- \rangle$				100					
6479	$\langle 35^- \rangle$					100				
7563	$\langle 39^- \rangle$						100			
8738	$\langle 43^- \rangle$							100		
10027	$\langle 47^- \rangle$								100	
11425	$\langle 51^- \rangle$									100

Energy levels and branching ratios [97Si09].

¹⁰⁰Ru₄₄

E^*	J^π	L	$(2J+1)C^2S$	L	S_N	S'	L	C^2S	L	$S_{\ell j}$	L	$T_{1/2}$ or	Ref.
[keV]			(τ, d)		(d, p)	(d, p)		(p, d)		(d, t)	(p, t)	Γ_{cm}	
0.0	0^+	4	0.77	2	2.7(4)	0.33(1)	2	0.40	2	0.192(6)	0	Stable	66So01
539.506(5)	2^+	2	0.13	0	0.09	0.040(3)	2	0.34			2	12.53(15) ps	80Pe12
				+2		0.102(5)			2	0.193(7)			02Ho17
1130.30(1)	0^+	$\langle 4 \rangle$	0.088	2		0.110(5)	2	0.07	2	0.064(3)		8.2(12) ps	80Pe12
1226.47(1)	4^+	0	0.009	2		0.081(5)	2	0.067	2	0.002(1)		2.6(2) ps	80Pe12
									4	0.061(7)			
1362.16(1)	2^+	2	0.016			x	0	0.032	0	0.015(1)		1.25(15) ps	80Pe12
									2	0.018(3)			
1740.99(1)	0^+	$\langle 4 \rangle$	0.086					weak					80Pe12
1865.10(1)	2^+			0		0.020(2)	2	0.066					80Pe12
				2		0.14(3)			2	0.055(2)			02Ho17
1881.04(1)	$\langle 3 \rangle^+$			2		0.017(2)		incl	0	0.020(2)			80Pe12
				4		0.28(3)			2	0.068(6)			02Ho17
2051.65(1)	$0^{\langle + \rangle}$									weak			
2062.52(3)	$\langle 3^-, 4^+ \rangle$			2		0.065(3)			2	0.0206(1)			02Ho17
2075.7(5)	$\langle 4^+ \rangle$												
2076.1(3)	6^+	4	0.38										80Pe12
2099.10(1)	2^+						2	0.03					80Pe12
2131(10)	$2^+, 3^+$						0+2	0.01					80Pe12
2166.87(1)	3^-			1		0.003(1)						30(6) ps	02Ho17
				2		0.023(4)				weak			02Ho17
				3		0.21(5)							02Ho17
2194(10)													
2240.80(1)	$\langle 1, 2 \rangle^+$						2+0	0.1, 0.1					80Pe12
2268(5)**	$2^+, 3^+$												
2313.5(3)	$\langle 2^+ - 4^+ \rangle$												

(continued)

¹⁰⁰Ru
44

E^*	J^π	L	$(2J+1)C^2S$	L	S_N	S'	L	C^2S	L	$S_{\ell j}$	L	$T_{1/2}$ or	Ref.
[keV]			(τ, d)		(d,p)	(d,p)		(p,d)		(d,t)	(p,t)	Γ_{cm}	
2324.6(4)	$\langle 3-6 \rangle$												
2351.4(4)	4^+												
2366.50(4)	$\langle 4 \rangle^+$												
2387.17(3)	$\langle 0 \rangle^+$						2	0.37					80Pe12
2411.8(2)*	$\langle 4^+ \rangle$												
2438(5)	$2^+, 3^+$						2+0	0.02					80Pe12
2469.38(1)	2^-												
2492.89(4)	4^-												
2512.45(5)	4^+						2+4	0.02					80Pe12
2516.82(1)	$\langle 1, 2 \rangle^-$												
2528.2(2)	5^-												
2536.17(3)	3^+												
2543.70(3)	2						2+0	0.1					80Pe12
2569.91(8)	3^-												
2576.8***	5^+												
2591.85(4)	4^-												
2606.0***													
2617.09(4)	$\langle 1, 2^+ \rangle$												
2634(10)	$\langle \leq 5 \rangle^+$						2	0.14					80Pe12
2660.13(2)	$\langle 1, 2 \rangle$												
2660.66(4)	$\langle 2^+-4^+ \rangle$												
2666.45(6)	$\langle 3, 4 \rangle$												
2695(10)	$\langle 1-7^+ \rangle$						4	0.075					80Pe12
2738.7***	$\langle 3, 4 \rangle$												
2745.59(5)	$\langle 1, 2^+ \rangle$												
2747.17(6)	$\langle 2-5 \rangle$	4	3.0										80Pe12
2764.87(6)	4^-						2+0	0.01					80Pe12
2775.24(9)	2^+-4^+						2+0	0.03					80Pe12
2801.49(4)													
2800.9	$3^{\langle - \rangle}$												
2801.3	$3^{\langle + \rangle}$												
2816(10)	$2^+, 3^+$						2+0	0.03, 0.009					80Pe12
2832.8(17)													
2837.83(10)	$\langle 0^+-2^+ \rangle$												
2862.7***													
2877.49(10)	3^+						2+0	0.01, 0.002					80Pe12
2878.4	2^+-4^+												
2890(10)	$2^+, 3^+$						2+0	0.02, 0.004					80Pe12
2905.0	$3, 4^+$												
2915.54(6)	2^-												
2933.65(10)	$\langle 1^+, 2^+ \rangle$						2	0.014					80Pe12
2952.7(3)	7^-												
2964.8(3)	6^-												
2983.25(10)	$\langle 1^+-4^+ \rangle$						2	0.018					80Pe12
2998.9	3, 4												

(continued)

¹⁰⁰Ru
44

E^*	J^π	L	$(2J+1)C^2S$	L	S_N	S'	L	C^2S	L	$S_{\ell j}$	L	$T_{1/2}$ or Γ_{cm}	Ref.
[keV]			(τ, d)		(d,p)	(d,p)		(p,d)		(d,t)	(p,t)		
3016.67(11)													
3058.1(10)	$\langle 2-4 \rangle$						2+0	0.03,0.008					80Pe12
3060.15(5)	$\langle 1, 2^+ \rangle$												
3064.8	3,4												
3062.2(3)	8^+	4	3.13										80Pe12
3069.520(7)	$\langle 1, 2 \rangle^-$												
3072.24(2)	$\langle 2^+ \rangle$						2+0	0.02,0.009					80Pe12
3110.9(2)	$\langle 2^+-4 \rangle$						2+0	0.03,0.007					80Pe12
3118.5	$3, 4^+$												
3132(10)**													
3140.4(3)	7^-												
3178(10)	$2^+, 3^+$						0	0.002					80Pe12
3265.1(4)	$\langle 8^+ \rangle$	4	3.74										80Pe12
3268(10)	$\langle \leq 5^+ \rangle$						2	0.025					80Pe12
3278(10)													
3300.67(10)	$\langle 2^+, 3^+ \rangle$												
3323.71(3)	$\langle 1, 2^+ \rangle$						2+0	0.04,0.007					80Pe12
3326.3(1)													
3332.6(1)													
3348.2(1)													
3356.0(3)	8^-												
3375.1(1)													
3419.1(2)	$\langle 1, 2^+ \rangle$						0	0.0017					80Pe12
3441(10)	$2^+, 3^+$						0	0.0089					80Pe12
3460.4(15)													
3463.67(5)	$\langle 1^+, 2 \rangle$												
3504.6(3)	9^-												
3517(10)	$2^+, 3^+$						2+0	0.02,0.005					80Pe12
3576.9(4)	$\langle 7, 9 \rangle^-$												
3585(10)	$2^+, 3^+$						2+0	0.002,0.002					80Pe12
3608(10)	$2^+, 3^+$						2+0	0.001,0.002					80Pe12
3693(10)	$\langle \leq 5 \rangle^+$						2	0.016					80Pe12
3732.0(2)													
3779.8(2)	$\langle 1^+-4^+ \rangle$						2	0.012					80Pe12
3877.9(2)	$\langle 2^+, 3^+ \rangle$						2+0	0.006,0.001					80Pe12
3883.1(3)													
3973.7(5)	$\langle 1-4 \rangle$												
3983.1(7)	$\langle 1-4 \rangle$												
3993.8(3)	$\langle 10 \rangle^-$												
4000.8(2)													
4049.5(12)													
4085.2(5)	10^+												
4091.5(14)													
4102.9(11)													
4148.6(20)													

(continued)

¹⁰⁰Ru
44

E^*	J^π	L	$(2J+1)C^2S$	L	S_N	S'	L	C^2S	L	$S_{\ell j}$	L	$T_{1/2}$ or	Ref.
[keV]			(τ, d)		(d, p)	(d, p)		(p, d)		(d, t)	(p, t)	Γ_{cm}	
4187.7(3)	$\langle 1-4 \rangle$												
4232.1(4)	$\langle 11 \rangle^-$												
4257.2(3)													
4273.5(16)													
4307.4(10)													
4317.5(5)	$\langle 9, 11 \rangle$												
4337.6(18)													
4355.3(10)	$\langle 10^+ \rangle$												
4366.4(18)	$\langle 1-4 \rangle$												
4376.1(11)													
4403.6(12)													
4519.6(9)													
4530(3)													
4543.7(18)													
4585.6(12)													
4601.2(12)													
4650.7(20)													
4799.6(5)	$\langle 12^- \rangle$												
4920.4(5)	$\langle 12^+ \rangle$												
5129.2(6)	$\langle 10-12^+ \rangle$												
5164.5(5)	$\langle 13 \rangle^-$												
5279.6(6)	$\langle 9-13 \rangle$												
5715.9(6)	$\langle 14^+ \rangle$												
6200.8(6)	$\langle 15^- \rangle$												
6717(1)	$\langle 16^+ \rangle$												
7829(2)	$\langle 18^+ \rangle$												
9059(2)	$\langle 20^+ \rangle$												
10380(2)	$\langle 22^+ \rangle$												
11742(3)	$\langle 24^+ \rangle$												
13172(3)	$\langle 26^+ \rangle$												
14739(3)	$\langle 28^+ \rangle$												
		80Pe12		66So01			80Pe12						Ref.
				97Si09	02Ho17				02Ho17	97Si09			Ref.

Additional data on this isotope can be found in [02Ho17, 01Ge03, 00Ti07, 00Ge01, 98Hi01, 96Gi04, 91Is05, 93Gi02, 88Co18, 87Na20, 66So01].

Abundance: 12.60(7) %.

* Data for the (p,d) reaction from [80Pe12] were erroneously escribed to another level [02Ho17].

** This level should be excluded according to [02Ho17].

*** New levels, $E^*=2414.0$ keV [01Ge03] disagrees with $E^*=2411.8(2)$ keV in [97Si09].

Relations $d\sigma/d\Omega_{exp}=4.42(2J+1)d\sigma/d\Omega_{DWBA}C^2S/(2j+1)(2I+1)$ for (τ, d) reaction and $d\sigma/d\Omega_{exp}=2.24d\sigma/d\Omega_{DWBA}C^2S/(2j+1)$ for the (p,d) were used in [80Pe12].

Comparison of experimental and theoretical $B(E2)$ values is given in [01Ge03].

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [97Si09]. Part 2

¹⁰⁰Ru
44

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	0.0 0 ⁺	539 2 ⁺	1130 0 ⁺	1226 4 ⁺	1362 2 ⁺	1741 0 ⁺	1865 2 ⁺	1881 $\langle 3 \rangle^+$	2051.6 0 ⁽⁺⁾	2062.5 $\langle 3^-, 4^+ \rangle$
539.506(5)	2 ⁺		100									
1130.30(1)	0 ⁺	x		100								
1226.47(1)	4 ⁺			100								
1362.16(1)	2 ⁺	42.2	57.8									
1740.99(1)	0 ⁺	x	59	x		41						
1865.10(1)	2 ⁺	25	36.3	27.9	5.1	5.8						
1881.04(1)	$\langle 3 \rangle^+$		78.3		8.2	13.5						
2051.65(1)	0 ⁽⁺⁾		86			14						
2062.52(3)	$\langle 3^-, 4^+ \rangle$		24		41	35						
2075.7(5)	$\langle 4^+ \rangle$		100									
2076.1(3)	6 ⁺				100							
2099.10(1)	2 ⁺	2.7	81	3.3	1.7	10.8			0.15(5)			
2166.87(1)	3 ⁻	4.1	82		2.3	0.77			10.5(7)			
2240.80(1)	$\langle 1, 2 \rangle^+$	0.6	92	8								
2313.5(3)	$\langle 2^+ - 4^+ \rangle$		64		21	15						
2324.6(4)	$\langle 3 - 6 \rangle$				19							81(13)
2351.4(4)	4 ⁺		x		x							
2366.50(4)	$\langle 4 \rangle^+$		86		14							
2387.17(3)	$\langle 0 \rangle^+$		51			49						
2411.8(2)*	$\langle 4^+ \rangle$		100									
2469.38(1)	2 ⁻	0.46	36.1			42.2			0.72(3)	15.6(2)		
2492.89(4)	4 ⁻				34				19(3)	13(1)		34(4)
2512.45(5)	4 ⁺		32			3				52(2)		2(1)
2516.82(1)	$\langle 1, 2 \rangle^-$	1.45	16.4	24.5		14.9	6.0(1)	28.5(3)			6.46(7)	
2528.2(2)	5 ⁻				88							12(6)
2536.17(3)	3 ⁺		66		8	4			1.2(3)			
2543.70(3)	2	16	17	4		33			26(2)	4(1)		
2569.91(8)	3 ⁻		5		26	23						
2591.85(4)	4 ⁻		0.8	1.8	19	1.3				43(5)		
2617.09(4)	$\langle 1, 2^+ \rangle$	94							6.4(14)			
2660.13(2)	$\langle 1, 2 \rangle$	17	83									
2660.66(4)	$\langle 2^+ - 4^+ \rangle$		25		14					24(3)		37(5)
2666.45(6)	$\langle 3, 4 \rangle$		61	39								
2745.59(5)	$\langle 1, 2^+ \rangle$		21	61				10(3)			7(2)	
2747.17(6)	$\langle 2 - 5 \rangle$				100							
2764.87(6)	4 ⁻				63			8(2)		8(2)		
2775.24(9)	2 ⁺ -4 ⁺				100							
2801.49(4)			68									
2837.83(10)	$\langle 0^+ - 2^+ \rangle$		100									
2877.49(10)	3 ⁺		x									
2915.54(6)	2 ⁻	0.10	47.6			30.1				2.26(2)		
2933.65(10)	$\langle 1^+, 2^+ \rangle$	100										
2983.25(10)	$\langle 1^+ - 4^+ \rangle$		x									
3060.15(5)	$\langle 1, 2^+ \rangle$	67	19			14						
3069.520(7)	$\langle 1, 2 \rangle^-$	0.07	74.2			4.9			0.9(1)			

(continued)

 $^{100}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	0.0 0 ⁺	539 2 ⁺	1130 0 ⁺	1226 4 ⁺	1362 2 ⁺	1741 0 ⁺	1865 2 ⁺	1881 (3) ⁺	2051.6 0 ⁽⁺⁾	2062.5 (3 ⁻ ,4 ⁺)
3072.24(2)	(2 ⁺)		6.4				44		5(1)	6.7(4)		
3323.71(3)	(1,2 ⁺)		3.6	69	6.3						4(1)	
3419.1(2)	(1,2 ⁺)		72	28								
3463.67(5)	(1 ⁺ ,2)		33							33(20)		

Energy levels and branching ratios [97Si09]. Part 3

 $^{100}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	2076.1 6 ⁺	2099.1 (2) ⁺	2166.9 3 ⁻	2241 (1,2) ⁺	2366.5 (4) ⁺	2469.4 2 ⁻	2512.4 X ⁽⁺⁾	2516.8 (1,2) ⁻	2528.2 5 ⁻	2536.2
2469.38(1)	2 ⁻			2.34(3)	2.25(5)	0.45(4)						
2512.45(5)	4 ⁺			11(2)								
2516.82(1)	(1,2) ⁻				1.91(7)							
2536.17(3)	3 ⁺					21(3)						
2569.91(8)	3 ⁻			1.6(3)	44(9)							
2591.85(4)	4 ⁻				34(4)							
2764.87(6)	4 ⁻						21(6)					
2915.54(6)	2 ⁻			0.546(6)	1.32(1)			17.5(2)	0.10(3)	0.204(2)		0.08(1)
2952.7(3)	7 ⁻	85(8)									15(1)	
2964.8(3)	6 ⁻	68(3)									32(5)	
3062.2(3)	8 ⁺	100										
3069.520(7)	(1,2) ⁻				2.8(1)	0.4(1)		6.82(7)		3.20(3)		2.6(4)
3072.24(2)	(2 ⁺)			5.6(5)	11(1)	11(1)		7(1)		3.3(2)		
3140.4(3)	7 ⁻	20(5)									52(5)	
3265.1(4)	(8 ⁺)	57(9)										
3323.71(3)	(1,2 ⁺)			4.8(8)				5.25(8)		6.7(8)		

Energy levels and branching ratios [97Si09]. Part 4

 $^{100}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	2569.9 (3,4) ⁻	2617.1 (1,2 ⁺)	2660.1 (1,2)	2666.4	2915.5 2 ⁻	2952.7 7 ⁻	2964.8 6 ⁻	3060.2 (1,2 ⁺)	3062.2 8 ⁺	3140.4 7 ⁻
2801.49(4)					32(5)							
2915.54(6)	2 ⁻	0.116(2)	0.007(1)	0.025(1)	0.018(1)							
3069.520(7)	(1,2) ⁻	3.27(4)		0.19(2)		0.76(2)						
3140.4(3)	7 ⁻							28(5)				
3265.1(4)	(8 ⁺)									43(5)		
3356.0(3)	8 ⁻							34(6)	60(4)		5(2)	
3504.6(3)	9 ⁻							39(2)			29(2)	22(1)

(continued)

 $^{100}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		E^*_f : J^π_f :	2569.9 $\langle 3,4 \rangle^-$	2617.1 $\langle 1,2^+ \rangle$	2660.1 $\langle 1,2 \rangle$	2666.4	2915.5 2^-	2952.7 7^-	2964.8 6^-	3060.2 $\langle 1,2^+ \rangle$	3062.2 8^+	3140.4 7^-
3576.9(4)	$\langle 7,9 \rangle^-$							100				
4085.2(5)	10^+										100	
4355.3(10)	$\langle 10^+ \rangle$										x	

Energy levels and branching ratios [97Si09]. Part 5

 $^{100}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		E^*_f : J^π_f :	3265.1 $\langle 8^+ \rangle$	3323.7 $\langle 1,2^+ \rangle$	3356.0 8^-	3504.6 9^-	3576.9 $\langle 7,9 \rangle^-$	3993.8 $\langle 10 \rangle^-$	4085.2 10^+	4232.1 $\langle 11 \rangle^-$	4317.5 $\langle 9,11 \rangle$	4355.3 $\langle 10^+ \rangle$
3356.0(3)	8^-		1.1(3)									
3463.67(5)	$\langle 1^+, 2 \rangle$			34(3)								
3504.6(3)	9^-				10(1)							
3993.8(3)	$\langle 10 \rangle^-$				71(4)	29(4)						
4085.2(5)	10^+	x										
4232.1(4)	$\langle 11 \rangle^-$					100		<13				
4317.5(5)	$\langle 9,11 \rangle$						100					
4799.6(5)	$\langle 12^- \rangle$							100		<36		
4920.4(5)	$\langle 12^+ \rangle$								100			x
5129.2(6)	$\langle 10-12^+ \rangle$								100			
5164.5(5)	$\langle 13 \rangle^-$									100		
5279.6(6)	$\langle 9-13 \rangle$										100	

Energy levels and branching ratios [97Si09]. Part 6

 $^{100}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		E^*_f : J^π_f :	4920.4 $\langle 12^+ \rangle$	5164.5 $\langle 13 \rangle^-$	5715.9 $\langle 14^+ \rangle$	6717 $\langle 16^+ \rangle$	7829 $\langle 18^+ \rangle$	9059 $\langle 20^+ \rangle$	10380 $\langle 22^+ \rangle$	11742 $\langle 24^+ \rangle$	13172 $\langle 26^+ \rangle$	
5715.9(6)	$\langle 14^+ \rangle$		100									
6200.8(6)	$\langle 15^- \rangle$			100								
6717(1)	$\langle 16^+ \rangle$				x							
7829(2)	$\langle 18^+ \rangle$					x						
9059(2)	$\langle 20^+ \rangle$						x					
10380(2)	$\langle 22^+ \rangle$							x				
11742(3)	$\langle 24^+ \rangle$								x			
13172(3)	$\langle 26^+ \rangle$									x		
14739(3)	$\langle 28^+ \rangle$											x

Energy levels and branching ratios [98Bl03].

¹⁰¹₄₄Ru

E^*	$2J^\pi$	L	S'	σ (d,p)	$(2J+1)S$	L	S_N	S_N	L	C^2S	L	S'	σ (d,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	(d,p)	$\mu\text{b/sr}$	(d,p)	(d,p)	(p,d)	(p,d)		(p,d)		(d,t)	$\mu\text{b/sr}$	Γ_{cm}	
0.0	5 ⁺	2	2.10	2700(200)	2.09	2	1.67	2.09	2	2.25	2	1.8	5620(230)	Stable	94Du08
127.23(1)	3 ⁺	2	0.067	71(6)	0.08	2			2	0.013	$\langle 2 \rangle$	0.006	15(4)	0.65(1) ns	94Du08
306.86(1)	7 ⁺	4	5.3	490(140)					4	2.86	4	2.3	560(40)	0.05(1) ns	94Du08
311.37(2)	5 ⁺								2	0.29	2	0.2	incl	≤ 0.2 ns	94Du08
325.23(3)	1 ⁺	0	0.96	4200(300)	1.30	0			0	0.16	0	0.32	2430(120)	0.20(4) ns	94Du08
344.0(4)															
422.22(3)	3 ⁺	2	0.15	190(50)	0.17	2			2	0.20	2	0.22	380(60)	≥ 1 ps	94Du08
527.56(10)	11 ⁻	5	5.8						5	0.99	5	0.33	570(40)	17.5(4) μs	94Du08
535.0(12)	3 ⁺	2	0.75	1080(60)	1.03	2			2	0.3	2	0.26	incl		94Du08
545.11(1)	7 ⁺													1.5(3) ps	
598.34(18)	$\langle 5^- \rangle$	3	0.74	590(50)	3.62	4					3	0.1	150(20)		94Du08
616.30(10)	3 ⁺ , 5 ⁺										2	0.3	610(60)		94Du08
623(5)	3 ⁺ , 5 ⁺								2	0.4, 0.3			1070(100)		86Di10
623.59(19)	1 ⁺	0	0.063	260(20)	0.09	0			0	0.063	0	0.12		≥ 1 ps	94Du08
684(2)	5 ⁺ , 3 ⁺	2	0.2	250(20)	0.03, 0.2	0, 2			2	0.03	$\langle 1 \rangle$	0.008	62(7)		94Du08
720.0(24)	1 ⁻ , 3 ⁻	1	0.02	65(10)									135(15)		88Du12
720.02(5)	9 ⁺								4	0.29	4	0.72	incl	2.1(5) ps	94Du08
742(7)				55(10)											
824(2)	3 ⁺ , 5 ⁺	2	0.4	530(30)	0.39, 0.5	2			2	0.2, 0.1	2	0.2	320(30)		94Du08
842.76(4)	$\langle 7 \rangle^+$														
907(2)	1 ⁻ , 3 ⁻	1	0.06	260(20)							1	0.01	90(20)		94Du08
927(5)	3 ⁺ , 5 ⁺								2	0.06					86Di10
928.77(5)	9 ⁺														
938.36(1)	$\langle 7 \rangle^+$														
958.4(4)	15 ⁻														
973.4(12)	3 ⁺	2	0.70	880(60)	0.59	2			2	0.14	2	0.16	250(20)		94Du08
1001.2(1)	11 ⁺														
1038(2)	3 ⁺ , 5 ⁺								2	0.1	2	0.09	150(20)		94Du08
1051(7)	7 ⁺ , 9 ⁺	4	0.28	26(5)											88Du12
1098(7)	1 ⁺	0	0.028	230(40)											88Du12
1111(2)	1 ⁺	0	0.17	810(50)	0.19	0			0	0.012	0	0.02	130(20)		94Du08
1164(2)	3 ⁺ , 5 ⁺								2	0.04			54(8)		86Di10
1206.8(4)															
1219.0(3)															
1225(5)	7 ⁺ , 9 ⁺								4	0.3, 0.2					86Di10
1227(7)	1 ⁺	0	0.16	140(40)											88Du12
1266(2)	3 ⁺ , 5 ⁺	2	0.02	31(8)									26(10)		88Du12
1276(5)	1 ⁺								0	0.011					86Di10
1321.6(2)	$\langle 11^+ \rangle$														
1390.0(3)															
1425(2)													47(9)		
1477(2)	3 ⁺ , 5 ⁺								2	0.2	2	0.12	190(20)		94Du08
1499.3(11)	1, 3												14(6)		
1500.9(3)	13 ⁺			560(10)										0.6(2) ps	88Du12
1542(2)	3 ⁺ , 5 ⁺			74(26)					2	0.06			40(20)		86Di10

(continued)

¹⁰¹Ru
₄₄

E^*	$2J^\pi$	L	S'	σ (d,p)	$(2J+1)S$	L	S_N	S_N	L	C^2S	L	S'	σ (d,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	(d,p)	$\mu\text{b/sr}$	(d,p)	(d,p)	(p,d)	(p,d)		(p,d)		(d,t)	$\mu\text{b/sr}$	Γ_{cm}	
1587.3(2)	5^+	2	0.45	750(40)	0.46	2			2	0.1	2	0.08	82(9)		94Du08
1622.3(5)	19^-													>1.2 ps	
1659(7)				22(5)											88Du12
1688(2)	$11^-, 9^-$	5	3.7	260(30)	2.14	5							70(20)		88Du12
1701(5)	$\langle 3^+, 5^+ \rangle$								$\langle 2 \rangle$	0.08					86Di10
1714(2)	1^+	0	0.01	57(8)					0	0.026	0	0.02	100(10)		94Du08
1758(2)	1^+								0	0.021			100(10)		86Di10
1761.9(1)											0	0.02			94Du08
1774.1(5)	11^-													2.4(10) ps	
1779(7)	$3^-, 1^-$	1	0.03	130(14)											88Du12
1813	$5^+, 3^+$	2	0.06	100(20)									55(6)		98Bl03
1822(2)	$5^+, 3^+$	2	0.08	130(20)	0.1, 0.2	2			2	0.09	2	0.04	20(3)		98Bl03
1843.4(10)	3^+	2	0.04	80(20)									13(2)		88Du12
1858(2)	1^+	0	0.06	290(30)									13(2)		88Du12
1862.4(4)	15^+													>1.7 ps	
1880.1(10)	3^+	2	0.25	440(30)	0.46	2									88Du12
1893(7)				120(30)											88Du12
1936(7)	1^+	0	0.06	260(20)											88Du12
1961.5(11)															
1971.0(12)	3^+	2	0.21	350(20)					2	0.07	2	0.05	67(10)		94Du08
1997.0(10)	$3^+, 3^-$	2	0.12	210(20)							1	0.1	350(20)		94Du08
2017.0(13)															
2017.5(5)	$\langle 11-19 \rangle$														
2057(7)	1^+	0	0.076	330(30)											88Du12
2063.4(5)													21(2)		
2076(15)															
2086.7(10)	1,3			50(10)									20(10)		88Du12
2100(15)															
2131(3)	$1^-, 3^-$	1	0.038	140(20)									180(20)		88Du12
2147(7)	$\langle 1^-, 3^- \rangle$	$\langle 1 \rangle$	0.04	220(20)											88Du12
2156(15)															
2173.9(5)	17^+													>1.4 ps	
2222.7(5)	$\langle 11-19 \rangle$			75(9)											88Du12
2244(15)															
2299(7)	$3^+, 5^+$	2	0.1	160(60)											88Du12
2317.7(10)	1,3														
2326.8(9)															
2346.0(6)	$\langle 1^-, 3^- \rangle$	$\langle 1 \rangle$	0.02	100(10)											88Du12
2363(15)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$													
2377.2(5)*	17^+														02Ya13
2404(7)	$3^+, 5^+$	2	0.2	440(40)											88Du12
2420(15)															
2443(7)	$3^+, 5^+$	2	0.1	220(20)											88Du12
2459(7)	$\langle 5^-, 7^- \rangle$	$\langle 3 \rangle$	0.05	50(10)											88Du12
2473.2(6)	23^-														

(continued)

¹⁰¹Ru
₄₄

E^*	$2J^\pi$	L	S'	σ (d,p)	$(2J+1)S$	L	S_N	S_N	L	C^2S	L	S'	σ (d,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	(d,p)	$\mu\text{b/sr}$	(d,p)	(d,p)	(p,d)	(p,d)		(p,d)		(d,t)	$\mu\text{b/sr}$	Γ_{cm}	
2493(7)	$5^+, 3^+$	2	0.06	140(30)											88Du12
2544(7)				120(30)											88Du12
2560.9(9)	1,3														
2601.3(15)	$5^-, 7^-$	3	0.13	140(20)											88Du12
2625.5(15)	1,3			120(20)											88Du12
2659.6(9)	1,3			220(20)											88Du12
2694(7)	$5^+, 3^+$	2	0.04	80(10)											88Du12
2718(7)	$1^-, 3^-$	1	0.05	220(20)											88Du12
2752(7)				90(10)											88Du12
2768.5(13)															
2784(7)	$5^-, 7^-$	3	0.026	150(30)											88Du12
2797.5(8)	$\langle 15-23 \rangle$													0.55(7) ps	
2801.8(6)	$\langle 21^+ \rangle$														
2815(7)				80(20)											88Du12
2823.8(5)	19^+														
2844(7)	$\langle 5^-, 7^- \rangle$	$\langle 3 \rangle$	0.1	140(20)											88Du12
2869(7)				130(40)											88Du12
2878.4(11)	1,3														
2885.5(5)	19^+														02Ya13
2901(7)				60(10)											88Du12
2918(7)				150(40)											88Du12
2931(7)				140(20)											88Du12
2977(7)				80(20)											88Du12
2984.2(6)															
3019(7)				150(20)											88Du12
3052.0(8)*	21^+													1.0(4) ps	02Ya13
3065(7)				160(20)											88Du12
3083(7)				180(60)											88Du12
3120(7)				60(20)											88Du12
3173(7)				130(20)											88Du12
3228(7)	1^+	0	0.031	240(20)											88Du12
3237															02Ya13
3285.9(13)	1,3														
3395.4(11)	1,3														
3441.3(9)	$\langle 23^+ \rangle$														
3475.7(6)	27^-													1.0(2) ps	
3656															02Ya13
3681*	25^+														02Ya13
3714															02Ya13
4044.0(12)															
4141**	$\langle 27^+ \rangle$														02Ya13
4183	$\langle 27^+ \rangle$														02Ya13
4451*	$\langle 29^+ \rangle$														02Ya13
4613.6(7)	31^-													0.42(11) ps	
4967**	$\langle 31^+ \rangle$														02Ya13

(continued)

¹⁰¹₄₄Ru

E^*	$2J^\pi$	S'	σ (d,p)	$(2J+1)S$	L	S_N	S_N	C^2S	S'	σ (d,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	(d,p)	(d,p)	(p,d)	(p,d)	(p,d)	(d,t)	$\mu\text{b/sr}$	Γ_{cm}	
5233	$\langle 31^+ \rangle$											02Ya13
5265												02Ya13
5275												02Ya13
5375*	33^+											02Ya13
5849.3(8)	35^-										0.35(10) ps	
5903												02Ya13
5946**	$\langle 35^+ \rangle$											02Ya13
6469*	$\langle 37^+ \rangle$											02Ya13
7077**	$\langle 39^+ \rangle$											02Ya13
7096***	$\langle 39^- \rangle$											
7679*	$\langle 41^+ \rangle$											02Ya13
8318**	$\langle 43^+ \rangle$											02Ya13
8433***	$\langle 43^- \rangle$											
9002*	$\langle 45^+ \rangle$											02Ya13
9826***	$\langle 47^- \rangle$											
		88Du12	88Du12		77Ho02			83Ao01	86Di10	94Du08		Ref.
				77Ho02		83Ao01				94Du08		Ref.

Additional data on this isotope can be found in [03ReZY, 02Ya13, 98Fo08, 93Gi02, 86Di10, 82Kl02].

Abundance: 17.06(2) %.

* New levels of the ground state band (No 1 in [02Ya13]).

** New levels of the band built on $7/2^+$ state with $E^*=307$ keV (No 2 in [02Ya13]).*** New levels of the band built on $11/2^-$ state with $E^*=528$ keV (No 3 in [02Ya13]).

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [98Bl03]. Part 2

¹⁰¹₄₄Ru

E^*	$2J^\pi$	Branching ratios in percentage										
		E_f^* :	0.0	127	307	311	325	422	528	545	598.34	616.30
[keV]		$2J_f^\pi$:	5^+	3^+	7^+	5^+	1^+	3^+	11^-	7^+	$\langle 5^- \rangle$	$3^+, 5^+$
127.23(1)	3^+		100									
306.86(1)	7^+		99(4)	0.66(2)								
311.37(2)	5^+		11(2)	89(4)								
325.23(3)	1^+		13.9(1)	86(2)								
344.0(4)			100									
422.22(3)	3^+		22(1)	66(2)	2.0(3)	3.8(4)	7(3)					
527.56(10)	11^-				100							
545.11(1)	7^+		92(6)	≈ 0.1	4.34(3)	3.81(3)						
598.34(18)	$\langle 5^- \rangle$		75(3)		8.1(4)	17.1(7)						
616.30(10)	$3^+, 5^+$		32(8)	68(10)								
623.59(19)	1^+		26(4)	74(13)								
720.02(5)	9^+		80(2)		6.7(2)	2.6(2)				10.6(11)		

(continued)

 $^{101}_{44}\text{Ru}$

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		$E_f^*:$ $2J_f^\pi:$	0.0 5 ⁺	127 3 ⁺	307 7 ⁺	311 5 ⁺	325 1 ⁺	422 3 ⁺	528 11 [−]	545 7 ⁺	598.34 ⟨5 [−] ⟩	616.30 3 ⁺ ,5 ⁺
842.76(4)	⟨7 ⁺ ⟩		12(1)	35(1)		53(1)						
928.77(5)	9 ⁺		40(1)		28(1)	19(1)				13.1(3)		
938.36(1)	⟨7 ⁺ ⟩		9.7(6)	6.8(6)	4.7(3)	51(2)		12(1)		11.8(9)		4.3(5)
958.4(4)	15 [−]								100			
1001.2(1)	11 ⁺				87(3)							
1206.8(4)											100	
1219.0(3)										100		
1321.6(2)	⟨11 ⁺ ⟩									49(1)		
1390.0(3)					100							
4044.0(12)			100									

Energy levels and branching ratios [98Bl03]. Part 3

 $^{101}_{44}\text{Ru}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		$E_f^*:$ $2J_f^\pi:$	720.0 1 ⁻ , 3 ⁻	720.02 9 ⁺	842.76 7 ⁺	928.77 9 ⁺	958.4 15 ⁻	1001.15 11 ⁺	1500.9 13 ⁺	1622.3 19 ⁻	1862.4 15 ⁺
1001.2(1)	11 ⁺			12.5(3)							
1321.6(2)	11 ⁺			≈41		9.4(4)					
1500.9(3)	13 ⁺		100								
1587.3(2)	5 ⁺			<36	53(2)	47(2)					
1622.3(5)	19 ⁻						100				
1761.9(1)						100					
1774.1(5)	11 ⁻						100				
1862.4(4)	15 ⁺							100			
2017.5(5)	11–19						100				
2063.4(5)							100				
2173.9(5)	17 ⁺								100		
2222.7(5)	11–19						100				
2346.0(6)	1 ⁻ , 3 ⁻									100	
2377.2(5)*	17 ⁺								100		
2473.2(6)	23 ⁻									100	
2797.5(8)	15–23									100	
2823.8(5)	19 ⁺										100
3052.0(8)*	21 ⁺									100	

Energy levels and branching ratios [98Bl03]. Part 4

¹⁰¹₄₄Ru

E^* [keV]	$2J^\pi$	Branching ratios in percentage					
		$E_f^*:$ $2J_f^\pi:$	2173.9 17 ⁺	2473.2 23 ⁻	2823.8 19 ⁺	3475.7 27 ⁻	4613.6 31 ⁻
2801.8(6)	⟨21 ⁺ ⟩		100				
2885.5(5)	19 ⁺		100				
2984.2(6)				100			
3441.3(9)	⟨23 ⁺ ⟩				100		
3475.7(6)	27 ⁻			100			
4613.6(7)	31 ⁻					100	
5849.3(8)	35 ⁻						100

Energy levels and branching ratios [98De15].

¹⁰²₄₄Ru

E^* [keV]	J^π	L	S_N (d,p)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage					
						$E_f^*:$ $J_f^\pi:$	0 0 ⁺	475 2 ⁺	944 0 ⁺	1103 2 ⁺	1106 4 ⁺
0	0 ⁺	2	⟨0.54⟩	Stable	66So01						
475.079(24)	2 ⁺	2,0	0.03,0.07	18.3(2) ps	66So01		100				
943.69(6)	0 ⁺			25(4) ps		x		100			
1103.15(3)	2 ⁺			4.0(5) ps		37(1)		63(2)			
1106.35(5)	4 ⁺			3.0(5) ps				100			
1521.66(5)	3 ⁺							72(3)		23(2)	4.6(4)
1580.56(6)	2 ⁺					6(1)		61(4)	33(3)		
1602.9(4)	⟨3,4 ⁺ ⟩							16(1)			84(12)
1798.71(13)	⟨4 ⁺ ⟩							9(2)		58(8)	32(4)
1837.10(8)	0 ⁺							76(8)		20(4)	
1873.21(8)	6 ⁺										100
1968.65(21)	⟨0 ⁺ ⟩									100	
2036.99(13)	2 ⁺						12(8)	44(12)			12(8)
2043.50(6)	3 ⁻							47(5)		53	
2152.74(6)											100
2190.0(14)											
2219.16(7)	5 ⁺										27(1)
2240.54(20)											
2261.23(5)	2 ^{⟨-⟩}					1(1)		0.6(6)		34(2)	
2302.70(11)	⟨4⟩										100
2367.3(7)	⟨3 ⁻ ⟩										
2370.6(4)	5 ⁻										100
2385.7(11)											
2421.0(17)	⟨3,4 ⁺ ⟩							63(4)		37(3)	
2441.8(3)	⟨3,4 ⁺ ⟩							22.8(14)		64(3)	
2460(5)											
2467.39(6)											
2567(5)											
2592.2(11)	⟨4⟩										

(continued)

 $^{102}_{44}\text{Ru}$

E^* [keV]	J^π	L	S_N (d,p)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage					
						$E^*_f:$ $J^\pi_f:$	0 0 ⁺	475 2 ⁺	944 0 ⁺	1103 2 ⁺	1106 4 ⁺
2611.24(11)	$\langle 3,4^+ \rangle$										
2614								66(3)		34(3)	
2648.8(4)	6^-										
2652.70(9)											
2676.1(10)	$\langle 0-2 \rangle^+$							100			
2700.89(8)	$\langle 3,4^+ \rangle$							63(3)		30(2)	
2703.2(3)	8^+										
2704.3(3)	7^-										
2711.15(6)											
2719.1(4)	$\langle 3,4^+ \rangle$							34(1)		44(2)	
2789.84(6)											
2800.97(9)											
2814.2(3)	$\langle 3,4^+ \rangle$							7.2(9)		37(2)	
2822.9(11)											
2877.5(13)											
2899.0(14)											
2909.1(10)	$\langle 0-2 \rangle^+$							100			
2913.7(7)	$\langle 3,4^+ \rangle$							44(2)		56(2)	
2938**	7^-				05So09						
2940.3(8)	$\langle 8^- \rangle$										
2946.1(6)											
2956.4(17)											
2967.0(13)											
3010.2(7)	$\langle 3,4^+ \rangle$							17.6(12)		58(5)	
3033.52(6)											
3056.73(8)											
3085.6(18)											
3136	9^-										
3157.1(21)											
3234.2(11)											
3244.7(14)											
3329**	8^-				05So09						
3347.2(26)											
3385.0(11)	$\langle 9^- \rangle$										
3388.6(13)											
3431.3(5)	10^+										
3450.4(11)											
3458**	9^-				05So09						
3468.9(15)											
3535.3(9)	$\langle 10^- \rangle$										
3549.1(15)											
3576.7(14)											
3680.1(13)											
3688.6(12)											
3699.6(13)											

(continued)

¹⁰²Ru
44

E^*	J^π	L	S_N	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]			(d,p)	Γ_{cm}		E_f^* :	0	475	944	1103
						J_f^π :	0 ⁺	2 ⁺	0 ⁺	2 ⁺
3718.4(11)										
3733.0(22)										
3741.3(11)										
3749.3(13)										
3758.5(10)										
3770.3(9)										
3782.1(11)										
3791.3(13)										
3816.3(7)	11 ⁻									
3821.1(11)										
3840.9(12)										
3860***	10 ⁺									
3875.7(16)										
3885.6(11)										
3937.0(13)										
3972.9(14)										
4014**	10 ⁻				05So09					
4033.5(14)										
4052.3(7)	12 ⁺									
4066.2(13)										
4081.0(13)										
4087.9(13)										
4113.9(22)										
4125.3(14)										
4179.1(15)										
4179.8(13)										
4185**	11 ⁻				05So09					
4366**	12 ⁻				05So09					
4613.3(10)										
4706.3(9)	$\langle 13 \rangle^-$									
4721***	12 ⁺				05So09					
4803.3(12)	14 ⁺									
4841**	$\langle 12^- \rangle$				05So09					
5071**	13 ⁻				05So09					
5371**	14 ⁻				05So09					
5678***	14 ⁺				05So09					
5717.3(13)	$\langle 16^+ \rangle$									
5725*	16 ⁺				05So09					
5750*	15 ⁻				05So09					
5768**	$\langle 14^- \rangle$				05So09					
6059**	15 ⁻				05So09					
6081***	$\langle 14^+ \rangle$				05So09					
6508**	16 ⁻				05So09					
6727**	$\langle 16^- \rangle$				05So09					
6791*	18 ⁺				05So09					

(continued)

¹⁰²Ru
44

E^*	J^π	L	S_N	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,p)	Γ_{cm}		E_f^* : J_f^π :	0 0 ⁺	475 2 ⁺	944 0 ⁺	1103 2 ⁺	1106 4 ⁺
6919*	17 ⁻				05So09						
7001***	16 ⁺				05So09						
7119**	17 ⁻				05So09						
7751**	18 ⁻				05So09						
7999*	20 ⁺				05So09						
8054***	18 ⁺				05So09						
8128*	19 ⁻				05So09						
8248**	19 ⁻				05So09						
9038**	⟨20 ⁻ ⟩				05So09						
9249***	20 ⁺				05So09						
9305*	22 ⁺				05So09						
9373*	21 ⁻				05So09						
9511**	⟨21 ⁻ ⟩				05So09						
10684*	⟨23 ⁻ ⟩				05So09						
10709*	24 ⁺				05So09						
			66So01		Ref.						

Additional data on this isotope can be found in [03ReZY, 03Re10, 00De60, 98Hi01, 95Ef01, 93Fa11, 91Is05, 66So01].

Abundance: 31.55(14) %.

* New level of the ground state band and the band built on 3⁻ state with $E^*=2046$ keV (No 1 and 2 in [05So09]).

** New level of the ground state band and the band built on 6⁻ state with $E^*=2661$ keV, 7⁻ state with $E^*=2938$ keV and 8⁻ state with $E^*=3329$ keV (No 3,4,5 in [05So09]).

*** New levels of the band built on 10⁺ state with $E^*=3860$ keV (No 6-7 in [05So09]).

Comparison of presented $S_N=S(2J_f+1)/(2J_i+1)$ with the theory is given in [66So01, 98De15].

Energy levels and branching ratios [98De15]. Part 2

¹⁰²Ru
44

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1522 3 ⁺	1581 2 ⁺	1799 ⟨4 ⁺ ⟩	1873.21 6 ⁺	2043.50 3 ⁻	2370.6 5 ⁻	2648.8 6 ⁻	2704.3 7 ⁻	2940.3 ⟨8 ⁻ ⟩	3136 9 ⁻
1837.10(8)	0 ⁺			4(2)								
2036.99(13)	2 ⁺			32(8)								
2043.50(6)	3 ⁻			x								
2219.16(7)	5 ⁺		67(3)		4.9(5)	1.33(15)						
2261.23(5)	2 ^{⟨-⟩}		31(5)	34(2)			0.6(6)					
2441.8(3)	⟨3,4 ⁺ ⟩		13(2)									
2592.2(11)	⟨4⟩						100					
2648.8(4)	6 ⁻					76(7)		24(3)				
2700.89(8)	⟨3,4 ⁺ ⟩		6.7(9)									
2703.2(3)	8 ⁺					100						
2704.3(3)	7 ⁻					92(5)		8.3(17)				

(continued)

 $^{102}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	1522 3 ⁺	1581 2 ⁺	1799 4 ⁺	1873.21 6 ⁺	2043.50 3 ⁻	2370.6 5 ⁻	2648.8 6 ⁻	2704.3 7 ⁻	2940.3 8 ⁻	3136 9 ⁻
2719.1(4)	3,4 ⁺		22(3)									
2814.2(3)	3,4 ⁺		56(6)									
2940.3(8)	8 ⁻								65(3)	35(3)		
3010.2(7)	3,4 ⁺		24.0(12)									
3136	9 ⁻									100		
3385.0(11)	9 ⁻									100		
3431.3(5)	10 ⁺									100		
3535.3(9)	10 ⁻										100	
3770.3(9)											100	
3816.3(7)	11 ⁻											100

Energy levels and branching ratios [98De15]. Part 3

 $^{102}_{44}\text{Ru}$

E^* [keV]	J^π	Branching ratios in percentage					
		$E_f^*:$ $J_f^\pi:$	3431.3 10 ⁺	3770.3	3816.3 11 ⁻	4052.3 12 ⁺	4803.3 14 ⁺
4052.3(7)	12 ⁺		100				
4613.3(10)				100			
4706.3(9)	13 ⁻				100		
4803.3(12)	14 ⁺					100	
5717.3(13)	16 ⁺						100

Energy levels and branching ratios [01De37].

 $^{103}_{44}\text{Ru}$

E^*	$2J^\pi$	L	C^2S'	C^2S'	C^2S'	C^2S	S_{pd}/S_{dp}	L	C^2S	σ (d,t)	S_N	σ (d,t)	Ref.
[keV]		(d,p)	(d,p)	(d,p)	(d,p)	(p,d)	R		(d,t)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	
0.0	3 ⁺	2		1.40	1.44								98Ba89
2.81(5)	5 ⁺	2	1.35	incl	incl	1.29		2	1.11	3800(20)	1.97	4293	98Ba89
136.079(3)	5 ⁺	2	0.012	≤0.01	≤0.03	0.13	≥4	2	0.072	240(10)	0.14	233	98Ba89
174.26(4)	1 ⁺	0	0.75	0.85	1.05	0.28		0	0.29	2420(20)	0.43	1799	98Ba89
213.56(7)	7 ⁺	4	1.80	2.35	1.57	0.96		4	2.07	310(30)	2.36	295	98Ba89
238.2(7)	11 ⁻	5	3.2	3.25	2.35	1.55		5	1.47	200(20)	1.92	201	98Ba89
297.48(10)	7 ⁻	3	0.40	1.5	0.26	0.17		3	0.02	380(30)	0.08	323	98Ba89
297.6(10)	3 ⁺		incl	incl	incl					incl			98Ba89
346.38(1)	3 ⁺	2	0.060	≤0.06	0.05	0.14	2.8	2	0.1	300(20)	0.16	304	98Ba89
404.15(10)	7 ⁺							2	0.4	1000(60)			98Ba89
406.08(7)	3 ⁺ ,5 ⁺	2	0.8,0.9	0.85	1.0	0.35	0.33			incl	0.62	914	70Di05
432.06(9)	1 ⁺	0	0.027	0.055	0.08	0.09		0	0.07	600(30)	0.12	463	82Be19

(continued)

¹⁰³Ru
44

E^*	$2J^\pi$	L	C^2S'	C^2S'	C^2S'	C^2S	S_{pd}/S_{dp}	L	C^2S	σ (d,t)	S_N	σ (d,t)	Ref.
[keV]		(d,p)	(d,p)	(d,p)	(d,p)	(p,d)	R		(d,t)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	
475.9(9)													
501.15(7)	$\langle 5 \rangle^+$	2	0.032	≤ 0.05	0.02	0.22	11.0	2	0.2	460(30)	0.26	450	94Du08
535.4(16)	$3^+, 5^+$			0.14	0.03	0.05	1.67			145(13)			82Be19
548.21(12)	$\langle 1^+ \rangle$	0	0.046	0.06		0.02	≥ 5			incl	0.07	205	70Di05
554.58(16)	$\langle 1^+ \rangle$		incl	incl						incl			
557.7(4)	$\langle 9^+ \rangle$			incl						incl			
562.87(7)	$3^+, 5^+$				0.13	≤ 0.02	≤ 0.15						
568.17(15)													
591.97(6)	$\langle 5 \rangle^+$	2	0.35	0.33	0.22	0.21	0.95	2	0.2	540(30)	0.38	514	98Ba89
622.0(5)	$\langle 5^+ \rangle$	$\langle 2 \rangle$	0.009		0.04	0.05	1.25	2	0.05				98Ba89
653.7(8)	15^-												
661.55(5)	$\langle 3 \rangle^+$	2	0.251	0.24	0.18	0.05	0.28	2	0.05	40(9)	0.03	47	82Be19
697.2(3)	$7^+, 9^+$	4	0.71	1.00	0.37	0.34		4	0.34	40(10)	0.47	49	82Be19
735.2(4)	$\langle 5^+ \rangle$	0	0.053	0.064	0.17	0.09				710(50)			82Be19
736.89(13)	1^+		incl	incl	incl			0	0.09	incl	0.15	509	94Du08
748.8(5)	$\langle 5^+ \rangle$									incl			
771(3)	$7^+, 9^+$	4	0.30					2	0.1	280(10)			98Ba89
774.1(3)	11^+									incl			
774.77(8)	$3^+, 5^+$				0.03	0.17	5.7			incl			
855(2)										25(4)			94Du08
873.71(22)	$3^+, 5^+$												
903.05(19)	$\langle \leq 5^+ \rangle$							$\langle 2 \rangle$	0.17	108(8)	0.07	105	94Du08
905.36(13)	$3^+, 5^+$	2	0.5	0.67	0.52	0.09	0.14			incl			82Be19
907.64(19)	$\langle \leq 5^+ \rangle$			incl						incl			
911.6(9)	$\langle 7^+ \rangle$									incl			
927.24(18)	$\langle 1^+ \rangle$	0	0.008							40(10)			98Ba89
931.3(5)	$\langle 3, 5 \rangle$									incl			
940.50(13)										40(5)			94Du08
954.4(9)	$\langle 3 \rangle$												
988.8													
991.6(5)													
1004.0(15)	$3^+, 5^+$	2	0.05	0.09						34(5)			94Du08
1018.1(8)	$\langle 5, 7 \rangle$												
1020.4(11)	$\langle 13^- \rangle$												
1057(5)	$7^+, 9^+$	$\langle 4 \rangle$	0.017		0.02								98Ba89
1065.1(1)	$3^+ - 7^+$									26(4)			
1079.6(9)	$7^+, 9^+$	$\langle 4 \rangle$	0.1					$\langle 4 \rangle$	0.4	80(10)			94Du08
1106.7(7)	1^+	0	0.066	0.076	0.07					50(5)			98Ba89
1110.1(3)	$3^+, 5^+$							$\langle 2 \rangle$	0.02	incl			94Du08
1110.6(3)	$\langle 11^+ \rangle$									incl			
1133.7(7)													
1140.6(9)	$\langle 3, 5 \rangle$												
1171.3(7)	$\langle 1, 3 \rangle$												
1174.1(2)	$\langle 3 \rangle$												
1182(5)	$3^+, 5^+$	2	0.04										98Ba89

(continued)

 $^{103}_{44}\text{Ru}$

E^*	$2J^\pi$	L	C^2S'	C^2S'	C^2S'	C^2S	$S_{\text{pd}}/S_{\text{dp}}$	L	C^2S	σ (d,t)	S_{N}	σ (d,t)	Ref.
[keV]		(d,p)	(d,p)	(d,p)	(d,p)	(p,d)	R		(d,t)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	
1199.9(5)	13^+												
1215		2	0.03										
1238(2)	$3^+, 5^+$			0.26				2	0.05	100(9)			94Du08
1250.6(19)	$3^+, 5^+$	2	0.17	incl				2	0.04	77(8)			94Du08
1269.8(9)		$\langle 1,2 \rangle$	0.02										98Ba89
1288.2(9)													
1301.5(11)	19^-												
1313.6(7)	11^+												
1322(5)	11^-	5	1.37	$\langle 1.0 \rangle$	1.37					180(30)			98Ba89
1324.2(4)										incl			
1338(2)										160(20)			94Du08
1347.1(2)		≤ 3											98Ba89
1370(5)		$\langle 4,5 \rangle$	0.3										98Ba89
1378.4(9)													
1400.98(12)										260(80)			94Du08
1431.1(2)		$\langle 2,3 \rangle$	0.04										98Ba89
1443.7(9)	15^+												
1461(5)		$\langle 2,3 \rangle$	0.05										98Ba89
1473.8(9)													
1490.3(19)										270(20)			94Du08
1558.3(19)	$3^+, 5^+$	2	0.14	0.15				2	0.2	51(6)			94Du08
1604.47(15)	$\langle X^+ \rangle$	$\langle 2 \rangle$	0.02										
1642(5)													
1662(5)		$\langle 2 \rangle$											98Ba89
1699(5)													
1717.0(4)		≤ 2											98Ba89
1730.4(3)													
1755.3(19)	$1^-, 3^-$	$\langle 1,2 \rangle$	0.02		0.02			1	0.05	230(20)			98Ba89
1780(5)		$\langle 2,3 \rangle$	0.03		0.03								98Ba89
1809(5)	1^+	0	0.081	0.07	0.08								98Ba89
1817(2)										110(10)			94Du08
1835.9(2)													
1880.5(2)		$\langle 2,3 \rangle$	0.05		0.05								98Ba89
1892(2)										29(6)			94Du08
1906.1(2)		$\langle 1 \rangle$	0.02		0.02					35(5)			98Ba89
1961.9(2)	$3^+, 5^+$	2	0.26	0.35	0.35								98Ba89
2003.6(8)		$\langle 1,2 \rangle$	0.03		0.03								98Ba89
2022(2)										114(13)			94Du08
2058(6)	$3^+, 5^+$	$\langle 2 \rangle$	0.02		0.02								98Ba89
2082(6)	$3^+, 5^+$	2	0.05		0.05								98Ba89
2118(6)	$3^+, 5^+$	$\langle 2 \rangle$	0.08		0.08								98Ba89
2129.7(9)	23^-												
2131.8(10)	19^+												
2137(6)	$3^+, 5^+$	$\langle 2 \rangle$	0.02		0.02								98Ba89
2167	$7^+, 9^+$	4	0.08		0.08			4	1.6,3	230(7)			98Ba89

(continued)

¹⁰³Ru
44

E^*	$2J^\pi$	L	C^2S'	C^2S'	C^2S'	C^2S	S_{pd}/S_{dp}	L	C^2S	σ (d,t)	S_N	σ (d,t)	Ref.
[keV]		(d,p)	(d,p)	(d,p)	(d,p)	(p,d)	R		(d,t)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	
2206.0(2)													
2217(2)										39(5)			94Du08
2223.6(4)													
2232(2)										145(15)			94Du08
2248(6)													
2280(6)													
2299(2)	$1^-, 3^-$							1	0.04	240(20)			94Du08
2384(2)	$1^-, 3^-$							1	0.07	370(20)			94Du08
2405(6)													
2443.2(24)										130(30)			94Du08
2489(6)		≤ 2											98Ba89
2507(2)	$1^-, 3^-$							1	0.01	76(8)			94Du08
2515(6)	1^+	0	0.033										98Ba89
2520(2)										155(15)			94Du08
2548(6)	$1^-, 3^-$	1	0.034		0.03								98Ba89
2576.2(2)													
2627(6)	$5^+, 3^+$	2	0.044		0.04								98Ba89
2657(6)													
2679.6(20)	23^+												
2694(6)													
2723(6)													
2918													
2960(6)													
3015(6)		$\langle 0,1 \rangle$	0.03		0.03								98Ba89
3062(6)													
3078.7(18)	27^-												
3204(6)													
3275.6(23)	$\langle 27^+ \rangle$												
3325(6)													
3512(6)													
4058.6(25)	$\langle 31^+ \rangle$												
4083.0(19)	$\langle 31^- \rangle$												
5028(3)	$\langle 35^+ \rangle$												
			71Fo01	82Be19		82Be19		94Du08		70Di05			Ref.
		98Ba89	98Ba89		82Be19					94Du08		70Di05	Ref.

Additional data on this isotope can be found in [05Re11, 98Bo04, 98Fo08, 75Kl04].

The ratios $S_{pd}/S_{dp} = R = C^2S_{pd}/(2j+1)C^2S_{dp}$ and $S_{dt}/S_{dp} = R = S_{dt}/(2J+1)S_{dp}$ were used in [82Be19, 71Fo01] for the spin determination.

Parameter for the (d,p) reaction is deduced from $C^2S'=(2J+1)[\sigma_{exp}/\sigma_{DWBA}]/1.55$ [98Ba89].

Parameter for the (p,d) reaction is deduced from $C^2S=(2J+1)[\sigma_{exp}/\sigma_{DWBA}]/3.33$ [94Du08].

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [01De37]. Part 2

¹⁰³Ru
44

E^* [keV]	$2J^\pi$	σ (d,p)	S_{dt}/S_{dp}	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
		$\mu\text{b/sr}$	R	Γ_{cm}		$E_f^*:$ $2J_f^\pi:$	0.0 3 ⁺	2.81 5 ⁺	136.1 5 ⁺	174 1 ⁺	214 7 ⁺
0.0	3 ⁺	1.00		39.26(2) d	98Ba89						
2.81(5)	5 ⁺		1.4		98Ba89		100				
136.079(3)	5 ⁺		≈ 10		98Ba89		98(4)	2.2(3)			
174.26(4)	1 ⁺	0.85			98Ba89		97(4)	3(2)			
213.56(7)	7 ⁺	0.12		<15 ns	98Ba89		4.7(1)	94(4)	1.7(4)		
238.2(7)	11 ⁻	0.12		1.69(7) ms	98Ba89						100
297.48(10)	7 ⁻				98Ba89			100			
297.6(10)	3 ⁺				98Ba89			100			
346.38(1)	3 ⁺		≈ 3		98Ba89		60(2)	14.2(5)	26(2)	0.23(2)	
404.15(10)	7 ⁺	0.6			98Ba89			77(14)	16(6)		6(1)
406.08(7)	3 ⁺ , 5 ⁺		0.73		70Di05		2.0(5)	77(2)	18(2)	3.4(5)	
432.06(9)	1 ⁺	0.05			82Be19		87(3)			13(1)	
475.9(9)										x	
501.15(7)	$\langle 5 \rangle^+$		≈ 5		94Du08		69(2)		12(1)		19(1)
535.4(16)	3 ⁺ , 5 ⁺				82Be19						
548.21(12)	$\langle 1^+ \rangle$	0.07			70Di05			39(2)		8(2)	
554.58(16)	$\langle 1^+ \rangle$	incl					85(3)			13(1)	
557.7(4)	$\langle 9^+ \rangle$							47(3)	14(1)		33(2)
562.87(7)	3 ⁺ , 5 ⁺	0.026					71(3)	2.1(6)	4(1)	23(1)	
568.17(15)							7(2)				
591.97(6)	$\langle 5 \rangle^+$	0.3	1.15		98Ba89		19(1)	18(1)	13(1)	8(2)	30(2)
622.0(5)	$\langle 5^+ \rangle$				98Ba89						
653.7(8)	15 ⁻										
661.55(5)	$\langle 3 \rangle^+$	0.03	0.15		82Be19		32(1)	22(2)	4.4(5)	17(2)	
697.2(3)	7 ⁺ , 9 ⁺				82Be19				100		
735.2(4)	$\langle 5^+ \rangle$				82Be19			37(3)	40(12)		<9
736.89(13)	1 ⁺	0.45			94Du08		41(10)		10(2)	33(4)	
748.8(5)	$\langle 5^+ \rangle$										
771(3)	7 ⁺ , 9 ⁺				98Ba89						
774.1(3)	11 ⁺										89
774.77(8)	3 ⁺ , 5 ⁺						36(3)	6(4)	19(3)		
855(2)					94Du08						
873.71(22)	3 ⁺ , 5 ⁺										
903.05(19)	$\langle \leq 5^+ \rangle$	0.035	0.13		94Du08		60(17)			14(4)	
905.36(13)	3 ⁺ , 5 ⁺				82Be19		23(4)	41(4)	35(2)		x
907.64(19)	$\langle \leq 5^+ \rangle$						36(9)		36(10)	20(9)	9(3)
911.6(9)	$\langle 7^+ \rangle$										
927.24(18)	$\langle 1^+ \rangle$				98Ba89				5(1)	2.2(9)	
931.3(5)	$\langle 3, 5 \rangle$										
940.50(13)					94Du08		10(4)	61(5)	22(5)		7(2)
954.4(9)	$\langle 3 \rangle$								100		
988.8											x
991.6(5)											100
1004.0(15)	3 ⁺ , 5 ⁺				94Du08						
1018.1(8)	$\langle 5, 7 \rangle$										

(continued)

¹⁰³Ru
44

E^*	$2J^\pi$	σ (d,p)	$S_{\text{dt}}/S_{\text{dp}}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		$\mu\text{b/sr}$	R	Γ_{cm}		E_{f}^* : $2J_{\text{f}}^\pi$:	0.0 3 ⁺	2.81 5 ⁺	136.1 5 ⁺	174 1 ⁺	214 7 ⁺
1020.4(11)	$\langle 13^- \rangle$										
1057(5)	7 ⁺ ,9 ⁺				98Ba89						
1065.1(1)	3 ⁺ –7 ⁺						13(2)	15(2)	12(2)		22(3)
1079.6(9)	7 ⁺ ,9 ⁺				94Du08						
1106.7(7)	1 ⁺				98Ba89					100	
1110.1(3)	3 ⁺ ,5 ⁺				94Du08		65(22)				
1110.6(3)	$\langle 11^+ \rangle$										
1133.7(7)											50
1140.6(9)	$\langle 3,5 \rangle$										
1171.3(7)	$\langle 1,3 \rangle$										
1174.1(2)	$\langle 3 \rangle$										
1182(5)	3 ⁺ ,5 ⁺				98Ba89						
1199.9(5)	13 ⁺										
1215											
1238(2)	3 ⁺ ,5 ⁺				94Du08						
1250.6(19)	3 ⁺ ,5 ⁺				94Du08						
1269.8(9)					98Ba89						
1288.2(9)											
1301.5(11)	19 [–]										
1313.6(7)	11 ⁺										
1322(5)	11 [–]				98Ba89						
1324.2(4)											
1338(2)					94Du08						
1347.1(2)					98Ba89				29(14)		
1370(5)					98Ba89						
1378.4(9)											
1400.98(12)					94Du08		30(11)				
1431.1(2)					98Ba89				12(5)		
1443.7(9)	15 ⁺										
1461(5)					98Ba89						
1473.8(9)											
1490.3(19)					94Du08						
1558.3(19)	3 ⁺ ,5 ⁺				94Du08						
1604.47(15)	$\langle X^+ \rangle$						30(6)		7(3)	19(5)	
1642(5)											
1662(5)					98Ba89						
1699(5)											
1717.0(4)					98Ba89		63(16)		37(15)		
1730.4(3)							88(11)				
1755.3(19)	1 [–] ,3 [–]				98Ba89						
1780(5)					98Ba89						
1809(5)	1 ⁺				98Ba89						
1817(2)					94Du08						
1835.9(2)									52(10)		
1880.5(2)					98Ba89		12(4)		9(2)		

(continued)

¹⁰³Ru
44

E^*	$2J^\pi$	σ (d,p)	S_{dt}/S_{dp}	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		$\mu\text{b/sr}$	R	Γ_{cm}		E_f^* : $2J_f^\pi$:	0.0 3 ⁺	2.81 5 ⁺	136.1 5 ⁺	174 1 ⁺	214 7 ⁺
1892(2)					94Du08						
1906.1(2)					98Ba89					35(8)	
1961.9(2)	3 ⁺ ,5 ⁺				98Ba89			27(11)			
2003.6(8)					98Ba89						
2022(2)					94Du08						
2058(6)	3 ⁺ ,5 ⁺				98Ba89						
2082(6)	3 ⁺ ,5 ⁺				98Ba89						
2118(6)	3 ⁺ ,5 ⁺				98Ba89						
2129.7(9)	23 ⁻										
2131.8(10)	19 ⁺										
2137(6)	3 ⁺ ,5 ⁺				98Ba89						
2167	7 ⁺ ,9 ⁺				98Ba89						
2206.0(2)										15(5)	
2217(2)					94Du08						
2223.6(4)							100				
2232(2)					94Du08						
2248(6)											
2280(6)											
2299(2)	1 ⁻ ,3 ⁻				94Du08						
2384(2)	1 ⁻ ,3 ⁻				94Du08						
2405(6)											
2443.2(24)					94Du08						
2489(6)					98Ba89						
2507(2)	1 ⁻ ,3 ⁻				94Du08						
2515(6)	1 ⁺				98Ba89						
2520(2)					94Du08						
2548(6)	1 ⁻ ,3 ⁻				98Ba89						
2576.2(2)							27(6)				
2627(6)	5 ⁺ ,3 ⁺				98Ba89						
2657(6)											
2679.6(20)	23 ⁺										
2694(6)											
2723(6)											
2918											
2960(6)											
3015(6)					98Ba89						
3062(6)											
3078.7(18)	27 ⁻										
3204(6)											
3275.6(23)	$\langle 27^+ \rangle$										
3325(6)											
3512(6)											
4058.6(25)	$\langle 31^+ \rangle$										
4083.0(19)	$\langle 31^- \rangle$										
5028(3)	$\langle 35^+ \rangle$										

(continued)

¹⁰³Ru
44

E^*	$2J^\pi$	σ (d,p)	$S_{\text{dt}}/S_{\text{dp}}$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		$\mu\text{b/sr}$	R	Γ_{cm}		E_{f}^* : $2J_{\text{f}}^\pi$:	0.0 3 ⁺	2.81 5 ⁺	136.1 5 ⁺	174 1 ⁺	214 7 ⁺
		70Di05			Ref.						
			71Fo01		Ref.						

Energy levels and branching ratios [01De37]. Part 3

¹⁰³Ru
44

E^*	$2J^\pi$	E_{f}^* : $2J_{\text{f}}^\pi$:	238 11 ⁻	297 7 ⁻	298 3 ⁺	346.4 3 ⁺	404.1 7 ⁺	406.1 3 ⁺ ,5 ⁺	432.1 1 ⁺	501.1 <5> ⁺	548.2 <1> ⁺	554.6 <1> ⁺
[keV]												
548.21(12)	<1 ⁺ >				49(2)	4.8(5)						
554.58(16)	<1 ⁺ >								1.9(11)			
557.7(4)	<9 ⁺ >						5.5(6)					
568.17(15)					94(6)							
591.97(6)	<5> ⁺					10(2)						
622.0(5)	<5 ⁺ >			100								
653.7(8)	15 ⁻		100									
661.55(5)	<3> ⁺					16(2)				9(2)		
735.2(4)	<5 ⁺ >						23(2)					
736.89(13)	1 ⁺							8(2)	4(2)			5(1)
774.77(8)	3 ⁺ ,5 ⁺					16(4)	10(2)	13(3)				
873.71(22)	3 ⁺ ,5 ⁺			100								
903.05(19)	<≤5 ⁺ >			14(5)						13(7)		
911.6(9)	<7 ⁺ >			100								
927.24(18)	<1 ⁺ >			11(3)							44(3)	
931.3(5)	<3,5>										100	
988.8										100		
1018.1(8)	<5,7>			100								
1065.1(1)	3 ⁺ -7 ⁺						38(3)					
1079.6(9)	7 ⁺ ,9 ⁺						100					
1110.1(3)	3 ⁺ ,5 ⁺							22(13)	13(8)			
1110.6(3)	<11 ⁺ >						79(6)					
1133.7(7)							50					
1140.6(9)	<3,5>						100					
1171.3(7)	<1,3>			x							x	
1174.1(2)	<3>										100	
1269.8(9)							x					
1324.2(4)						100						
1347.1(2)				49(19)						22(4)		
1400.98(12)				19(6)				20(5)	12(4)			
1473.8(9)							100					
1604.47(15)	<X ⁺ >							29(8)	8(3)			
1730.4(3)									12(4)			
1880.5(2)											56(11)	

(continued)

 $^{103}_{44}\text{Ru}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E^*_f : $2J^\pi_f$:	238 11 ⁻	297 7 ⁻	298 3 ⁺	346.4 3 ⁺	404.1 7 ⁺	406.1 3 ⁺ ,5 ⁺	432.1 1 ⁺	501.1 <5> ⁺	548.2 <1 ⁺ >	554.6 <1 ⁺ >
1906.1(2)						13(5)						
1961.9(2)	3 ⁺ ,5 ⁺					6(3)				12(4)		
2206.0(2)						16(5)						
2576.2(2)										20(11)	22(11)	

Energy levels and branching ratios [01De37]. Part 4

 $^{103}_{44}\text{Ru}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E^*_f : $2J^\pi_f$:	557.7 <9 ⁺ >	562.9 <3 ⁺ ,5 ⁺ >	568.2	592.0 <5> ⁺	622.0 <5 ⁺ >	653.7 15 ⁻	661.5 <3> ⁺	736.9 1 ⁺	774.1 11 ⁺	907.6 <≤5 ⁺ >
748.8(5)	<5 ⁺ >		100									
774.1(3)	11 ⁺		10.8(12)									
873.71(22)	3 ⁺ ,5 ⁺				<59							
927.24(18)	<1 ⁺ >				38(2)		0.6(3)					
1020.4(11)	<13 ⁻ >							100				
1110.6(3)	<11 ⁺ >		21(2)									
1199.9(5)	13 ⁺		100								<15	
1288.2(9)					x							
1301.5(11)	19 ⁻							100				
1313.6(7)	11 ⁺		28(2)								72(7)	
1378.4(9)					x							
1400.98(12)				11(4)					8(3)			
1431.1(2)				34(9)		55(13)						
1443.7(9)	15 ⁺										100	
1604.47(15)	<X ⁺ >				6(2)							
1835.9(2)						24(10)			18(7)			
1880.5(2)						16(5)						
1906.1(2)									44(11)			
1961.9(2)	3 ⁺ ,5 ⁺					30(6)						
2206.0(2)									13(3)			22(11)
2576.2(2)										32(8)		

Energy levels and branching ratios [01De37]. Part 5

 $^{103}_{44}\text{Ru}$

E^*	$2J^\pi$	Branching ratios in percentage											
[keV]	E^*_f : $2J^\pi_f$:	927.2 (1 ⁺)	1174.1 (3)	1301.5 19 [−]	1338	1401.0	1443.7 15 ⁺	2131.8 19 ⁺	2679.6 23 ⁺	3078.7 27 [−]	3275.6 (27 ⁺)	4058.6 (31 ⁺)	
1835.9(2)		5(2)											
1880.5(2)			7(2)										

(continued)

¹⁰³Ru
44

E^* [keV]	$2J^\pi$	Branching ratios in percentage											
		E_f^* : $2J_f^\pi$:	927.2 $\langle 1^+ \rangle$	1174.1 $\langle 3 \rangle$	1301.5 19^-	1338	1401.0	1443.7 15^+	2131.8 19^+	2679.6 23^+	3078.7 27^-	3275.6 $\langle 27^+ \rangle$	4058.6 $\langle 31^+ \rangle$
1906.1(2)				9(4)									
1961.9(2)	$3^+, 5^+$		19(5)				7(4)						
2003.6(8)			100										
2129.7(9)	23^-				100								
2131.8(10)	19^+							100					
2167	$7^+, 9^+$					100							
2206.0(2)			7(3)	13(4)			16(5)						
2679.6(20)	23^+								100				
3078.7(18)	27^-								100				
3275.6(23)	$\langle 27^+ \rangle$									100			
4058.6(25)	$\langle 31^+ \rangle$											100	
4083.0(19)	$\langle 31^- \rangle$										100		
5028(3)	$\langle 35^+ \rangle$												100

Energy levels and branching ratios [84Bl13, 91Bl09].

¹⁰⁴Ru
44

E^* [keV]	J^π	σ (t,p) <i>rel.</i>	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage							
					E_f^* : J_f^π :	0.0 0^+	358 2^+	888 4^+	893 2^+	988 0^+	1242 3^+	1503 3
0.0	0^+	100.0	Stable									
358.03(7)	2^+	6.0	56(1) ps			100						
888.49(9)	4^+	2.1	5.6(6) ps				100					
893.11(8)	2^+	incl	5.0(5) ps			41(4)	59(4)					
988.28(17)	0^+	19.6	7.9(9) ps				100					
1242.37(9)	3^+						76(10)	7(1)	17(2)			
1502.60(10)	3						12(2)	33(3)	56(8)			
1515.44(9)	2					19(2)	67(6)	5(1)		9(2)		
1556.3(3)	6^+							100				
1872.39(12)								25(4)			75(30)	
1970.44(10)	3^-						100					
1974.7(4)	$\langle 6^-, 7 \rangle$											
2034.85(9)	2^+						70(6)				22(2)	
2080.84(10)							37(4)		18(2)		41(4)	
2232.7(3)	$\langle 5, 6^+ \rangle$							100				
2269.05(10)	$\langle 3, 4 \rangle$						48(4)	41(4)	9(1)			
2285.08(12)	2^+							93(10)				
2320.3(4)	8^+											
2329.23(18)	$\langle 1-3 \rangle$						81(9)		19(5)			
2373.76(12)	$\langle 3, 1 \rangle$						100					
2429.85(12)								85(7)				
2481.90(11)	3^-						77(6)	12(2)			6.2(9)	
2489.91(10)								3.8(8)	85(8)		11(1)	

(continued)

¹⁰⁴Ru
44

E^* [keV]	J^π	σ (t,p) <i>rel.</i>	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage							
					E_f^* : J_f^π :	0.0 0 ⁺	358 2 ⁺	888 4 ⁺	893 2 ⁺	988 0 ⁺	1242 3 ⁺	1503 3
2524.28(10)								18(2)			59(5)	14(1)
2597.31(16)							74(10)			26(7)		
2600.6(4)	$\langle 7, 8^+ \rangle$											
2613.8(4)	$\langle 7, 8^+ \rangle$											
2618.97(18)												
2629.99(12)									95(10)			
2759.97(16)								18(7)			61(7)	
2823.43(17)							69(6)	13(2)			17(3)	
3075.03(11)							48(5)		36(4)			
3075.1(5)	$\langle 8, 9 \rangle$											
3111.8(5)	10 ⁺											
3284.6(5)	$\langle 9, 10^+ \rangle$											
3333.81(23)							48(6)					
3414.43(20)							54(6)	17(3)				
3443.35(14)							9(2)		56(5)			
3501.59(11)							19(2)		38(4)			
3507.33(12)							52(4)					
3582.81(14)											33(8)	
3583.90(15)							31(3)		18(3)			
3618.17(15)							23(4)		51(6)		26(6)	
3676.74(19)							35(5)	65(6)				
3691.1(6)	$\langle 9-11 \rangle$											
3713.4(6)	$\langle 12^+ \rangle$											
3875.41(18)							30(5)		20(3)		18(7)	
3919.46(19)									40(5)		60(8)	
4170.10(17)							15(5)		17(4)		17(6)	
4263.73(20)									72(9)			
4267.70(19)									41(6)			
4439.2(7)	$\langle 14^+ \rangle$											
5357	$\langle 16^+ \rangle$											
		72Ca10		Ref.								

Additional data on this isotope can be found in [05Re11, 01Ro22, 00De60, 00De33, 98Hi01, 97Re08, 86Cl01].

Abundance: 18.62(27) %.

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [84Bl13, 91Bl09]. Part 2

 $^{104}_{44}\text{Ru}$

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1515 2	1556.3 6 ⁺	1872.39	1970.44 3 ⁻	2034.85 2 ⁺	2080.84	2232.7 ⟨5,6 ⁺ ⟩	2285.08 2 ⁺	2320.3 8 ⁺	2373.76 ⟨3,1⟩
1974.7(4)	⟨6 ⁻ ,7⟩			100								
2034.85(9)	2 ⁺		7.9(8)									
2080.84(10)			4.7(8)									
2269.05(10)	⟨3,4⟩					2.6(7)						
2285.08(12)	2 ⁺					7.2(18)						
2320.3(4)	8 ⁺			100								
2429.85(12)						8(3)		7(3)				
2481.90(11)	3 ⁻					4.9(12)						
2524.28(10)						9(2)						
2600.6(4)	⟨7,8 ⁺ ⟩			100								
2613.8(4)	⟨7,8 ⁺ ⟩			87(10)					13(3)			
2618.97(18)						15(3)	42(6)			43(6)		
2629.99(12)						4.6						
2759.97(16)										21(6)		
3111.8(5)	10 ⁺										100	
3284.6(5)	⟨9,10 ⁺ ⟩										100	
3333.81(23)						52(9)						
3443.35(14)			27(3)									
3501.59(11)			4(2)			10(2)	21(2)					7(2)
3507.33(12)						8(2)	31(3)					10(4)
3583.90(15)												29(4)
3875.41(18)							33(8)					
4170.10(17)								51(6)				
4267.70(19)					59(8)							

Energy levels and branching ratios [84Bl13, 91Bl09]. Part 3

 $^{104}_{44}\text{Ru}$

E^*	J^π	Branching ratios in percentage										
[keV]		E^*_f : J^π_f :	2489.91	2524.28	2597.31	2613.8 $\langle 7,8^+ \rangle$	2618.97	2629.99	3075.1 $\langle 8,9 \rangle$	3111.8 10^+	3713.4 $\langle 12^+ \rangle$	4439.2 $\langle 14^+ \rangle$
3075.03(11)			16(4)									
3075.1(5)	$\langle 8,9 \rangle$					100						
3414.43(20)							30(8)					
3443.35(14)				8(3)								
3582.81(14)			67(7)									
3583.90(15)					22(4)							
3691.1(6)	$\langle 9-11 \rangle$								100			
3713.4(6)	$\langle 12^+ \rangle$									100		
4263.73(20)								28(9)				
4439.2(7)	$\langle 14^+ \rangle$										100	
5357	$\langle 16^+ \rangle$											x

Energy levels and branching ratios [93De15].

¹⁰⁵Ru
44

E^*	$2J^\pi$	L	$G_{\ell j}$	$(2J+1)S$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,p)	(d,p)	Γ_{cm}		E^*_f : $2J^\pi_\text{f}$:	0.0 3 ⁺	20.6 ⟨5⟩ ⁺	108 5 ⁺	159 1 ⁺	164 3 ⁺ ,5 ⁺
0.0	3 ⁺	⟨2⟩	0.009(4)		4.44(2) h	76Ma49						
20.610(13)	⟨5⟩ ⁺	2	1.54(6)	1.34	340(15) ns	76Ma49		100				
107.937(8)	5 ⁺	2	0.07(1)	0.05		76Ma49		100	<1.1			
159.518(6)	1 ⁺	0	0.74(6)	0.79	0.055(7) μs	76Ma49		100				
163.82(2)	3 ⁺ ,5 ⁺	2	0.18(4)	3.36	55(7) ns	76Ma49			95(5)	4.9(5)		
208.6(7)**	⟨11⟩ [−]	5	2.7(4)	incl		76Ma49						
229.48(4)	7 ⁺	4	0.75(8)	1.25		76Ma49		16(5)	72(7)	12(3)		
244.41(5)				incl				27(11)	27(15)	19(10)		26(13)
246.37(1)	⟨5 [−] ,3⟩	4,3	0.15,0.04	incl		76Ma49		3(2)	22(2)	38(2)		37(3)
272.72(2)	⟨3,5 ⁺ ⟩							33(2)	55(2)	1.2(9)	11(1)	
301.68(5)	7 ⁺	4	0.24(8)			76Ma49		71(24)	29(14)			
321.59(2)	3 [−]	1	0.080(8)			76Ma49		55(6)	5.7(8)	7.9(6)	3.5(7)	16(1)
441.95(4)	3 ⁺ ,5 ⁺	2	0.36,0.31	0.28		76Ma49		52(6)		22(6)	7(2)	
466.27(5)	⟨3⟩ ⁺	2	1.32(7)	1.09		76Ma49		23(2)	24(3)	34(5)	19(7)	
490.89(3)	⟨3⟩ [−]	3,1	0.02,0.03			76Ma49		77(6)			15(5)	
573.9**	⟨15 [−] ⟩					05De52						
578(2)	5 [−] ,7 [−]	3	0.21,0.15	0.19		76Ma49						
578.11(13)	⟨5 ⁺ ,3⟩		incl			76Ma49		76(8)		12(3)	11(3)	
582.12(6)	3 ⁺ ,5 ⁺	2	0.14,0.12			76Ma49						
625.83(14)	7 ⁺ ,9 ⁺	4,5	0.70,1.1			76Ma49			85(38)			
631.27(7)	1 ⁺	0	0.06(1)	0.09		76Ma49		66(7)			10(3)	
644.03(9)	⟨5,3⟩							18(3)		<4		37(4)
670.8(3)	⟨1 ⁺ ,3,5 ⁺ ⟩									93(27)		
725.92(11)	⟨5 [−] ,7,9 ⁺ ⟩	≥3	≥0.46			76Ma49				93(23)		
756.71(12)	3 ⁺ ,5 ⁺	2		0.19*		71Fo01		38(5)		24(5)		
784.56(7)	⟨1 [−] ⟩											1.0(7)
805.77(14)	1 ⁺	0	0.20	0.20*		76Ma49					100	
824.33(6)	3 ⁺ ,5 ⁺	2		0.46*		71Fo01		32(3)	7(4)	13(4)	8(3)	
841.12(21)	7 ⁺ ,9 ⁺	4		0.61*		71Fo01						
873.43(4)	1 ⁺	0		0.14		71Fo01					83(24)	
886.57(6)	3 ⁺	2		0.11*		71Fo01						
903.09(8)												79(6)
914(5)	⟨3 ⁺ ,5 ⁺ ⟩	2		0.11*		71Fo01						
956.73(10)	⟨3,5 ⁺ ⟩									24(8)	28(5)	
967.09(20)	⟨1,3,5 ⁺ ⟩											
994(5)	⟨3 ⁺ ,5 ⁺ ⟩			0.15*		71Fo01						
1058.78(14)	⟨3 ⁺ ,5,7 ⁺ ⟩											22(10)
1114(5)	⟨3 ⁺ ,5 ⁺ ⟩			0.24*		71Fo01						
1134.95(23)				⟨0.1⟩		71Fo01		85(32)				15(9)
1142.7**	⟨19 [−] ⟩					05De52						
1145(5)	⟨3 ⁺ ,5 ⁺ ⟩	2		0.10*		71Fo01						
1180.13(16)	⟨5 ⁺ ,3 ⁺ ⟩	2		0.15*		71Fo01			35(14)			
1325.5(1)	⟨1,3⟩											
1329.19(17)	⟨1,3,5 ⁺ ⟩											
1580(10)	⟨3 ⁺ ,5 ⁺ ⟩	⟨2⟩		0.15*		71Fo01						

(continued)

¹⁰⁵Ru
44

E^*	$2J^\pi$	L	$G_{\ell j}$	$(2J+1)S$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,p)	(d,p)	Γ_{cm}		E_{f}^* : $2J_{\text{f}}^\pi$:	0.0 3 ⁺	20.6 5 ⁺	108 5 ⁺	159 1 ⁺	164 3 ⁺ ,5 ⁺
1693.6(4)	⟨1,3,5 ⁺ ⟩										100	
1735.13(18)	⟨1,3⟩										24(10)	
1832.71(11)	⟨3,5 ⁺ ⟩										<1	
1843.2(3)											<18	
1845.4(3)	⟨1 ⁺ ,3,5 ⁺ ⟩								22(10)			
1867.4**	⟨23 ⁻ ⟩					05De52						
1930(10)		⟨2⟩		0.20*		71Fo01						
2148.4(3)	⟨1 ⁺ ,3,5 ⁺ ⟩								100			
2155.42(10)								72(8)				
2326.7(4)											17(3)	
2352.8(4)	⟨1 ⁺ ,3,5 ⁺ ⟩								35(14)			
2379.7(4)	⟨1,3,5 ⁺ ⟩											
2403.6(4)												
2404.08(20)	⟨1,3,5 ⁺ ⟩											
2710.6**	⟨27 ⁻ ⟩					05De52						
3641.2**	⟨31 ⁻ ⟩					05De52						
		76Ma49				Ref.						
				71Fo01		Ref.						

Additional data on this isotope can be found in [05De52, 98Fo08, 71Fo01].

* C^2S' calculated for $J^\pi=5/2^+$ and $J^\pi=7/2^+$ in the case of $L=2$ and $L=4$, respectively; energies are systematically higher than the adopted E^* by about 20-30 keV [71Fo01].

** band structure discussed in [05De52]

 $G_{\ell j}$ is determined by the relation $(d\sigma/d\Omega)_{\text{exp}}=1.53(d\sigma/d\Omega)_{\text{DWBA}}G_{\ell j}/(2j+1)$ [76Ma49].

Energy levels and branching ratios [93De15]. Part 2

¹⁰⁵Ru
44

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	229 7 ⁺	244	246 (5 ⁻ , 3)	272.7 (3, 5 ⁺)	301.7 7 ⁺	321.6 3 ⁻	441.9 3 ⁺ , 5 ⁺	466.3 (3) ⁺	490.9 (3) ⁻	578 5 ⁻ , 7 ⁻
321.59(2)	3 ⁻				12.4(13)	0.22(8)						
441.95(4)	3 ⁺ , 5 ⁺					20(2)						
490.89(3)	(3) ⁻					8.0(12)						
582.12(6)	3 ⁺ , 5 ⁺		27(7)			21(3)	52(4)					
625.83(14)	7 ⁺ , 9 ⁺		15(8)									
631.27(7)	1 ⁺					24(15)						
644.03(9)	(5, 3)				7(3)			38(12)				
670.8(3)	(1 ⁺ , 3, 5 ⁺)					7(4)						
725.92(11)	(5 ⁻ , 7, 9 ⁺)			7(4)								
756.71(12)	3 ⁺ , 5 ⁺					14(3)			24(10)			
784.56(7)	(1 ⁻)				5.1(18)			94(6)				
824.33(6)	3 ⁺ , 5 ⁺				14(7)						16(5)	
841.12(21)	7 ⁺ , 9 ⁺						100					

(continued)

¹⁰⁵Ru
44

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	229 7 ⁺	244	246 5 ⁻ ,3	272.7 3,5 ⁺	301.7 7 ⁺	321.6 3 ⁻	441.9 3 ⁺ ,5 ⁺	466.3 3 ⁺	490.9 3 ⁻	578 5 ⁻ ,7 ⁻
873.43(4)	1 ⁺					17(8)						
886.57(6)	3 ⁺				69(3)			28(3)		0.6(3)		
903.09(8)					8(8)		13(6)					
956.73(10)	3,5 ⁺				21(9)	26(6)						
1058.78(14)	3 ⁺ ,5,7 ⁺		4(3)				74(7)					
1180.13(16)	5 ⁺ ,3 ⁺		18(7)				33(8)		14(7)			
1325.5(1)	1,3							32(10)	<17			
1329.19(17)	1,3,5 ⁺								28(9)	72(18)		
1832.71(11)	3,5 ⁺					18(2)		21(2)		29(3)		
1843.2(3)						<18						
2155.42(10)						5.1(10)						
2326.7(4)						83(17)						
2352.8(4)	1 ⁺ ,3,5 ⁺								65(17)			
2403.6(4)			22(3)					78(16)				
2404.08(20)	1,3,5 ⁺											100

Energy levels and branching ratios [93De15]. Part 3

¹⁰⁵Ru
44

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E_f^* : $2J_f^\pi$:	631.3 1 ⁺	644.0 ⟨5,3⟩	784.6 ⟨1 ⁻ ⟩	824.3 3 ⁺ ,5 ⁺	886.6 3 ⁺	967.1	1058.8	1134.9
824.33(6)	3 ⁺ ,5 ⁺		9(2)							
886.57(6)	3 ⁺			2.4(3)						
967.09(20)	⟨1,3,5 ⁺ ⟩			100						
1325.5(1)	⟨1,3⟩				36(5)		32(3)			
1735.13(18)	⟨1,3⟩			52(13)			15(7)			9(4)
1832.71(11)	⟨3,5 ⁺ ⟩		10(1)		5(3)	16(1)				
1843.2(3)					100					
1845.4(3)	⟨1 ⁺ ,3,5 ⁺ ⟩							78(20)		
2155.42(10)					23(5)					
2379.7(4)	⟨1,3,5 ⁺ ⟩								100	

Energy levels and branching ratios [94De15].

¹⁰⁶Ru
44

E^*	J^π	L	σ (t,p)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	Γ_{cm}		$E_{\text{f}}^*:$ $J_{\text{f}}^\pi:$	0.0 0 ⁺	270 2 ⁺	715 $\langle 4^+ \rangle$	792 2 ⁺	991 0 ⁺
0.0	0 ⁺	0	714	373.59(15) d	72Ca10						
270.07(4)	2 ⁺	2	199		72Ca10		100				

(continued)

¹⁰⁶Ru
44

E^*	J^π	L	σ (t,p)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	Γ_{cm}		$\begin{smallmatrix} E_f^*: \\ J_f^\pi: \end{smallmatrix}$	$\begin{smallmatrix} 0.0 \\ 0^+ \end{smallmatrix}$	$\begin{smallmatrix} 270 \\ 2^+ \end{smallmatrix}$	$\begin{smallmatrix} 715 \\ \langle 4^+ \rangle \end{smallmatrix}$	$\begin{smallmatrix} 792 \\ 2^+ \end{smallmatrix}$	$\begin{smallmatrix} 991 \\ 0^+ \end{smallmatrix}$
714.69(10)	$\langle 4^+ \rangle$	$\langle 4 \rangle$	1.0		72Ca10		x	100			
792.31(4)**	2^+	2	72		72Ca10		41(3)	59(4)			
990.62(5)	0^+	0	135		72Ca10		x	100			
1091.6(1)**	$\langle 3^+ \rangle$							78(9)	9(5)	13(5)	
1295.8(2)*	6^+								100		
1307**	$\langle 4^+ \rangle$										
1392.21(7)	2^+						15(2)	65(7)	15(2)		5(2)
1642**	$\langle 5^+ \rangle$										
1688.41(21)										100	
1774.37(8)	$\langle 2^+ \rangle$	$\langle 2 \rangle$	40		72Ca10			75(8)			
1885.61(9)	$\langle 2^+ \rangle$	$\langle 2 \rangle$	70		72Ca10			100			
1908**	$\langle 6^+ \rangle$										
1973.4(4)	$\langle 8^+ \rangle$		38		72Ca10						
2151(8)			40		72Ca10						
2239.40(7)	$\langle 1 \rangle$						58(5)	38(4)			2.4(5)
2285**	$\langle 7^+ \rangle$										
2367(5)	$\langle 4^+ \rangle$	$\langle 4 \rangle$	58		72Ca10						
2467(10)			50		72Ca10						
2486*	$\langle 6^- \rangle$										
2544*	$\langle 7^- \rangle$										
2569(10)***			≈ 30		72Ca10						
2632.82(9)	$\langle 0^+ \rangle$	$\langle 0 \rangle$	≈ 88		72Ca10			18(5)		75(9)	
2701.43(8)	$\langle 1 \rangle$						65(6)	29(3)			6.5(6)
2705*	10^+										
2729***											
2771(5)	$\langle 2^+ \rangle$	$\langle 2 \rangle$	27		72Ca10						
2872*	$\langle 8^- \rangle$										
2876(10)			61		72Ca10						
2931(10)			≈ 45		72Ca10						
2945.94(15)	$\langle 1,2 \rangle$						91(7)			8.9(15)	
2961**	$\langle 9^+ \rangle$										
3000***											
3015***											
3047.13(15)	$\langle 1 \rangle$						54(5)	46(3)			
3059.53(10)	$\langle 1 \rangle$						5.9(5)	76(6)		14(3)	2.1(5)
3068*	$\langle 9^- \rangle$										
3186.43(15)	$\langle 1 \rangle$						61(6)	39(4)			
3210***											
3259.43(15)	$\langle 1 \rangle$						82(8)	18.3(16)			
3364.13(9)	$\langle 1 \rangle$						29(3)	18(2)		32(3)	
3424*	$\langle 10^- \rangle$										
3450*	$\langle 12^+ \rangle$										
3550.98(16)	$\langle 1 \rangle$						46(4)	19(2)		35(4)	
3705*	$\langle 11^- \rangle$										
3930.4(3)	$\langle 1,2 \rangle$						46(8)	54(8)			

(continued)

¹⁰⁶Ru
44

E^*	J^π	L	σ (t,p)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	Γ_{cm}		E_{f}^* : J_{f}^π :	0.0 0 ⁺	270 2 ⁺	715 $\langle 4^+ \rangle$	792 2 ⁺	991 0 ⁺
4120*	$\langle 12^- \rangle$										
4241*	$\langle 14^+ \rangle$										
4446*	$\langle 13^- \rangle$										
		72Ca10			Ref.						
		70Ca08			Ref.						

Additional data on this isotope can be found in [00De60, 00De33, 70Ca08].

* Level of the ground state band and the negative parity band based on 6⁻ and 7⁻ states with $E^*=2486$ and 2544 keV.** Level of the positive parity band based on 2⁺ state with $E^*=792$ keV.

*** Level of the additional band; levels of all bands were introduced in [00De33].

Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [94De15]. Part 2

¹⁰⁶Ru
44

E^*	J^π	Branching ratios in percentage					
[keV]		E_{f}^* : J_{f}^π :	1092 $\langle 3^+ \rangle$	1296 $\langle 6^+ \rangle$	1392 2^+	1774.37 $\langle 2^+ \rangle$	1885.61 $\langle 2^+ \rangle$
1774.37(8)	$\langle 2^+ \rangle$		25(4)				
1973.4(4)	$\langle 8^+ \rangle$			100			
2239.40(7)	$\langle 1 \rangle$						1.7(5)
2632.82(9)	$\langle 0^+ \rangle$				6.6(14)		
3059.53(10)	$\langle 1 \rangle$				2.6(11)		
3364.13(9)	$\langle 1 \rangle$					8(3)	13(2)