

$^{104}\text{Ru}(n,\gamma)$ E=th 1978Gu14,1974Hr01

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, J. Timar and Z. Elekes		NDS 161, 1 (2019)	1-Apr-2019

1978Gu14: Facility: DIDO reactor at Julich; Target: metallic Ru powder enriched to 96.39% in ^{104}Ru ; Beam: flux= 1.3×10^8 $\text{cm}^{-2}\text{s}^{-1}$; Detectors: two planar Ge, one rectangular Ge(Li), one NaI(Tl); Measured: γ , γ - γ coinc., γ - $\gamma(\theta)$ coinc., $E\gamma$, $I\gamma$; Deduced: ^{105}Ru level scheme, γ -ray Mult., J^π ; Also, from the same collaboration: [1976SeZK](#), [1975GuZE](#), [1975GuZP](#).

1974Hr01: Facility: DIDO reactor at Julich; Target: 100 mg metal powder enriched to 99.7% in ^{104}Ru and enclosed in graphite container; Beam: $E(n) \leq 0.02$ eV, flux = 8.5×10^7 $\text{cm}^{-2}\text{s}^{-1}$; Detectors: one Si(Li), one planar Ge(Li), two coaxial Ge(Li); Measured: γ - γ conc., $E\gamma$, $I\gamma$, γ - $\gamma(\theta)$.

Others: [1982Ba69](#), [1981BaZH](#), [1975BaZS](#), [1974Ba22](#), [1974GuZM](#), [1973BaWR](#), [1973EiZU](#).

 ^{105}Ru Levels

$^{104}\text{Ru}(n,\gamma)$ resonances between 2660 and 12000 eV are studied by [1980Ma08](#).

E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]
0.0	$3/2^+$	578.04 12	$5/2^-$	956.63 10	$(1/2^+, 3/2, 5/2^+)$
20.567 13	$5/2^+$	582.07 6	$3/2^+, 5/2^+$	967.16 21	$(1/2^+, 3/2^+)$
107.913 14	$5/2^+$	625.81 14	$(7/2^+, 9/2^+)$	1058.82 14	$(3/2^+, 5/2, 7/2^+)$
159.297 17	$1/2^+$	631.22 7	$1/2^+$	1134.57 20	$(1/2^+ \text{ to } 7/2^+)$
163.774 14	$(5/2^+)$	644.02 10	$(1/2 \text{ to } 7/2)$	1180.09 16	$(3/2^+, 5/2^+)$
229.47 4	$7/2^+$	670.56 5	$(1/2^+, 3/2^+)$	1325.39 13	$(1/2, 3/2)$
244.39 5		725.89 11	$(3/2 \text{ to } 9/2)$	1328.98 17	$(1/2^+, 3/2^+)$
246.272 15	$(3/2^+, 5/2^+)$	756.61 13	$(3/2, 5/2)^+$	1693.4 5	$(1/2^+, 3/2^+)$
272.642 16	$3/2^+$	784.49 10	$(1/2, 3/2)^-$	1735.21 20	$(1/2^+, 3/2^+)$
301.65 5	$7/2^+$	805.55 15	$1/2^+$	1832.5 4	$(1/2, 3/2)$
321.531 19	$3/2^-$	824.29 7	$3/2^+$	1845.5 3	$(1/2^+, 3/2^+)$
441.86 5	$3/2^+, 5/2^+$	841.09 21	$(7/2, 9/2)^+$	2148.2 5	$(3/2^+)$
464.33? 15		873.40 20	$1/2^+$	2352.5 4	$(1/2^+, 3/2^+)$
466.04 5	$3/2^+$	886.52 9	$3/2^+$	2380.6 6	$(1/2^+, 3/2^+)$
490.83 4	$(1/2, 3/2)^-$	903.13 15		2404.4 7	$(1/2^-, 3/2)$

[†] From a least squares fit to $E\gamma$.

[‡] From the Adopted Levels.

¹⁰⁴Ru(n,γ) E=th **1978Gu14,1974Hr01** (continued)

<u>γ(¹⁰⁵Ru)</u>									
<u>E_γ[†]</u>	<u>I_γ^{†a}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>δ&</u>	<u>α^b</u>	<u>Comments</u>
20.56 2	4.4 5	20.567	5/2 ⁺	0.0	3/2 ⁺	(M1+E2)	0.065 35	5.7 8	α: from I(γ+ce) balance at 20.567-keV level; Others: 6.7 12 (1978Gu14) and α≈24 (1974Hr01).
48.94 15	0.04 2	321.531	3/2 ⁻	272.642	3/2 ⁺				
55.85 2	0.8 1	163.774	(5/2 ⁺)	107.913	5/2 ⁺				
75.25 4	2.2 3	321.531	3/2 ⁻	246.272	(3/2 ⁺ ,5/2 ⁺)	[E1]			
80.61 7	0.16 8	244.39		163.774	(5/2 ⁺)				
82.49 2	6.2 6	246.272	(3/2 ⁺ ,5/2 ⁺)	163.774	(5/2 ⁺)	M1+E2	0.07 2		Mult.: A ₂₂ =-0.112 9 and A ₄₄ =-0.005 15 (1978Gu14) and A ₂₂ =-0.112 8 and A ₄₄ =0 (1978Gu14). δ: Also 0.45 4 (1978Gu14). Mult.: A ₂ =-0.32 3 and A ₄ =0.04 4 (1974Hr01). δ: also -2.40 12 (1978Gu14).
107.92 2	13.8 4	107.913	5/2 ⁺	0.0	3/2 ⁺	M1+E2	-0.094 28		
^x 112.53 22	0.05 2								
113.34 3	1.10 8	272.642	3/2 ⁺	159.297	1/2 ⁺				Mult.: A ₂₂ =0.003 11 and A ₄₄ =-0.031 21 (1978Gu14) or A ₂₂ =-0.004 17 and A ₄₄ =0 (1978Gu14).
121.61 8	0.17 4	229.47	7/2 ⁺	107.913	5/2 ⁺				
136.53 12	0.12 6	244.39		107.913	5/2 ⁺				
138.36 1	6.4 4	246.272	(3/2 ⁺ ,5/2 ⁺)	107.913	5/2 ⁺	M1+E2	-0.55 3		Mult.: A ₂₂ =-0.311 18 and A ₄₄ =0.015 9 (1978Gu14) or A ₂₂ =-0.305 15 and 0 (1978Gu14). δ: also -0.13 4 (1978Gu14). Mult.: A ₂ =-0.12 2 and A ₄ =0.00 2 (1974Hr01). δ: Also >12 (1978Gu14). Mult.: A ₂₂ =-0.161 16 and A ₄₄ =0.013 26 (1978Gu14) and A ₂₂ =-0.157 16 and A ₄₄ =0 (1978Gu14).
143.21 1	16.3 12	163.774	(5/2 ⁺)	20.567	5/2 ⁺	M1+E2	0.25 6		
157.81 5	2.9 3	321.531	3/2 ⁻	163.774	(5/2 ⁺)	[E1]			
159.30 2	15.3 20	159.297	1/2 ⁺	0.0	3/2 ⁺				
162.25 8	0.7 2	321.531	3/2 ⁻	159.297	1/2 ⁺				Mult.: A ₂₂ =0.22 28 and A ₄₄ =0.17 26 (1978Gu14) or A ₂₂ =0.017 26 and A ₄₄ =0 (1978Gu14). I _γ : 0.17 9 was given by 1974Hr01 which is in better agreement with I(164.4γ)/I(252γ)=0.051 12 as measured in ¹⁰⁵ Tc β ⁻ decay.
164.67 12	0.07 3	272.642	3/2 ⁺	107.913	5/2 ⁺				
169.18 5	0.63 5	441.86	3/2 ⁺ ,5/2 ⁺	272.642	3/2 ⁺	M1+E2	1.0 +8-4		Mult.: A ₂₂ =0.10 5 and A ₄₄ =-0.12 6 (1978Gu14) or A ₂₂ =0.07 4 and A ₄₄ =0 (1978Gu14).
^x 174.26 6	0.8 3								
^x 191.52 10	0.13 5								
193.00 8	0.27 6	824.29	3/2 ⁺	631.22	1/2 ⁺				
208.89 4	0.8 2	229.47	7/2 ⁺	20.567	5/2 ⁺				
213.66 4	1.49 15	321.531	3/2 ⁻	107.913	5/2 ⁺	E1			Mult.: A ₂₂ =0.205 16 and A ₄₄ =-0.015 25 (1978Gu14) or A ₂₂ =0.202 15 and A ₄₄ =0 (1978Gu14); δ=0.02 +5-8 (1978Gu14).
218.18 3	0.26 5	490.83	(1/2,3/2) ⁻	272.642	3/2 ⁺				
223.79 8	0.17 9	244.39		20.567	5/2 ⁺				
225.70 4	3.5 3	246.272	(3/2 ⁺ ,5/2 ⁺)	20.567	5/2 ⁺	M1(+E2)	0.04 32		Mult.: A ₂ =0.00 4 and A ₄ =0.07 6 (1974Hr01).
229.51 8	0.19 9	229.47	7/2 ⁺	0.0	3/2 ⁺				
242.45 10	0.37 7	886.52	3/2 ⁺	644.02	(1/2 to 7/2)				

γ(¹⁰⁵Ru) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†a}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>δ&</u>	<u>Comments</u>
244.35 ^{cd} 12	0.17 ^c 7	244.39		0.0	3/2 ⁺			
244.35 ^{cd} 12	0.17 ^c 7	490.83	(1/2,3/2) ⁻	246.272	(3/2 ⁺ ,5/2 ⁺)			
246.29 5	0.27 8	246.272	(3/2 ⁺ ,5/2 ⁺)	0.0	3/2 ⁺			
252.07 2	5.3 2	272.642	3/2 ⁺	20.567	5/2 ⁺	E2(+M1)	11 +14-4	
272.65 3	3.2 2	272.642	3/2 ⁺	0.0	3/2 ⁺	M1+E2	0.29 +11-7	
280.26 8	1.06 10	582.07	3/2 ⁺ ,5/2 ⁺	301.65	7/2 ⁺			
280.99 10	0.14 7	301.65	7/2 ⁺	20.567	5/2 ⁺			
282.67 10	0.18 5	441.86	3/2 ⁺ ,5/2 ⁺	159.297	1/2 ⁺			
300.92 5	0.89 12	321.531	3/2 ⁻	20.567	5/2 ⁺			
301.61 6	0.35 12	301.65	7/2 ⁺	0.0	3/2 ⁺			
^x 302.98 10	0.19 9							
305.05 20	0.5 3	464.33?		159.297	1/2 ⁺			
306.76 6	1.5 4	466.04	3/2 ⁺	159.297	1/2 ⁺	M1+E2		I _γ : 0.30 14 was measured by 1974Hr01. I(307γ)/I(446γ) ratio does not agree well with the ratio of 0.63 21 obtained in ¹⁰⁵ Tc β ⁻ decay. Mult.: A ₂₂ =-0.019 41 and A ₄₄ =0.41 17 (1978Gu14) or A ₂₂ =-0.015 37 and A ₄₄ =0 (1978Gu14).
309.51 8	0.42 5	582.07	3/2 ⁺ ,5/2 ⁺	272.642	3/2 ⁺			
314.75 12	0.4 2	756.61	(3/2,5/2) ⁺	441.86	3/2 ⁺ ,5/2 ⁺			
321.50 3	8.7 12	321.531	3/2 ⁻	0.0	3/2 ⁺	[E1]		
322.38 16	0.9 4	644.02	(1/2 to 7/2)	321.531	3/2 ⁻			
323.27 20	0.05 3	967.16	(1/2 ⁺ ,3/2 ⁺)	644.02	(1/2 to 7/2)			
331.64 16	0.5 2	490.83	(1/2,3/2) ⁻	159.297	1/2 ⁺			
333.28 20	0.34 15	824.29	3/2 ⁺	490.83	(1/2,3/2) ⁻			
333.90 20	0.7 2	441.86	3/2 ⁺ ,5/2 ⁺	107.913	5/2 ⁺	M1+E2	-0.62 +4-7	Mult.: A ₂₂ =-0.352 29 and A ₄₄ =0.038 48 (1978Gu14) or A ₂₂ =-0.340 25 and A ₄₄ =0 (1978Gu14). δ: Also -3.7 +5-6 (1978Gu14).
352.78 12	0.52 15	582.07	3/2 ⁺ ,5/2 ⁺	229.47	7/2 ⁺			
356.39 20	0.20 10	464.33?		107.913	5/2 ⁺			
357.94 12	1.4 3	466.04	3/2 ⁺	107.913	5/2 ⁺	M1+E2	-0.06 3	Mult.: A ₂₂ =0.150 15 and A ₄₄ =0.013 25 (1978Gu14) or A ₂₂ =0.158 13 and A ₄₄ =0 (1978Gu14). Mult.: A ₂₂ =-0.08 21 and A ₄₄ =0.66 32 (1978Gu14) or A ₂₂ =0.13 16 and A ₄₄ =0 (1978Gu14).
358.51 12	0.5 3	631.22	1/2 ⁺	272.642	3/2 ⁺			
396.38 15	0.04 2	625.81	(7/2 ⁺ ,9/2 ⁺)	229.47	7/2 ⁺			
397.77	0.18 5	644.02	(1/2 to 7/2)	246.272	(3/2 ⁺ ,5/2 ⁺)			
397.77	0.04 2	670.56	(1/2 ⁺ ,3/2 ⁺)	272.642	3/2 ⁺			
^x 408.2 3	0.16 8							
418.6 2	0.18 7	578.04	5/2 ⁻	159.297	1/2 ⁺			
421.7 ^{cd} 3	0.08 ^c 5	441.86	3/2 ⁺ ,5/2 ⁺	20.567	5/2 ⁺			
421.7 ^{cd} 3	0.08 ^c 5	886.52	3/2 ⁺	464.33?				E _γ : if placement of γ is correct no final level within 1.3 keV.
^x 426.4 2	0.13 5							

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¹⁰⁴Ru(n,γ) E=th 1978Gu14,1974Hr01 (continued)

γ(¹⁰⁵Ru) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†a}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>δ&</u>	<u>Comments</u>
^x 432.8 3	0.13 5							
439.00 15	0.61 6	1325.39	(1/2,3/2)	886.52	3/2 ⁺			
442.00 15	1.6 2	441.86	3/2 ⁺ ,5/2 ⁺	0.0	3/2 ⁺			
445.60 15	1.10 15	466.04	3/2 ⁺	20.567	5/2 ⁺			
462.89 12	5.6 4	784.49	(1/2,3/2) ⁻	321.531	3/2 ⁻	M1+E2	0.33 +12-7	E _γ : 445.6γ from 886-keV level in 1974Hr01. Mult.: A ₂₂ =0.349 40 and A ₄₄ =0.019 59 (1978Gu14) or A ₂₂ =0.353 38 and A ₄₄ =0 (1978Gu14). δ: Also 0.88 +15-18 (1978Gu14).
466.2 3	1.0 3	466.04	3/2 ⁺	0.0	3/2 ⁺			
470.3 2	0.20 6	578.04	5/2 ⁻	107.913	5/2 ⁺			
471.62 20	0.21 6	631.22	1/2 ⁺	159.297	1/2 ⁺			
480.1 4	0.52 24	644.02	(1/2 to 7/2)	163.774	(5/2 ⁺)			
481.50 12	0.04 2	725.89	(3/2 to 9/2)	244.39				
490.78 10	2.5 3	490.83	(1/2,3/2) ⁻	0.0	3/2 ⁺			
^x 496.6 3	0.09 6							
538.3 6	0.28 12	784.49	(1/2,3/2) ⁻	246.272	(3/2 ⁺ ,5/2 ⁺)			
539.44 20	1.0 2	841.09	(7/2,9/2) ⁺	301.65	7/2 ⁺			
540.6 2	0.7 1	1325.39	(1/2,3/2)	784.49	(1/2,3/2) ⁻			
562.65 4	0.51 15	670.56	(1/2 ⁺ ,3/2 ⁺)	107.913	5/2 ⁺			
565.02 15	3.7 4	886.52	3/2 ⁺	321.531	3/2 ⁻	E1+M2		Mult.: A ₂₂ =-0.013 48 and A ₄₄ =-0.012 76 (1978Gu14) or A ₂₂ =-0.017 43 (1978Gu14).
578.00 ^c 18	1.6 ^c 4	578.04	5/2 ⁻	0.0	3/2 ⁺			
578.00 ^c 18	0.3 ^c 2	824.29	3/2 ⁺	246.272	(3/2 ⁺ ,5/2 ⁺)			
^x 581.6 2	0.2 1							
^x 582.8 3	0.31 15							
^x 591.0 3	0.11 5							
600.65 ^{cd} 3	0.15 ^c 7	873.40	1/2 ⁺	272.642	3/2 ⁺			
600.65 ^{cd} 3	0.15 ^c 7	903.13		301.65	7/2 ⁺			
600.65 ^c 3	0.15 ^c 7	1735.21	(1/2 ⁺ ,3/2 ⁺)	1134.57	(1/2 ⁺ to 7/2 ⁺)			
605.1 3	0.22 10	625.81	(7/2 ⁺ ,9/2 ⁺)	20.567	5/2 ⁺			
618.0 2	0.56 14	725.89	(3/2 to 9/2)	107.913	5/2 ⁺			
621.4 3	0.06 4	784.49	(1/2,3/2) ⁻	163.774	(5/2 ⁺)			
631.3 2	1.38 15	631.22	1/2 ⁺	0.0	3/2 ⁺			
640.34 15	10.6 5	886.52	3/2 ⁺	246.272	(3/2 ⁺ ,5/2 ⁺)	M1+E2	0.20 2	Mult.: A ₂₂ =-0.003 15 and A ₄₄ =-0.023 23 (1978Gu14) or A ₂₂ =-0.008 14 (1978Gu14). δ: -0.25 2 (1978Gu14). Mult.: A ₂₂ =0.025 55 and A ₄₄ =-0.043 99 (1978Gu14) and A ₂₂ =0.015 43 and A ₄₄ =0 (1978Gu14).
646.25 15	0.94 17	805.55	1/2 ⁺	159.297	1/2 ⁺			
665.0 2	0.12 7	824.29	3/2 ⁺	159.297	1/2 ⁺			
684.00 15	0.34 8	956.63	(1/2 ⁺ ,3/2,5/2 ⁺)	272.642	3/2 ⁺			
^x 686.95 20	0.35 10							
^x 692.3 3	0.20 7							
710.2 4	0.28 12	956.63	(1/2 ⁺ ,3/2,5/2 ⁺)	246.272	(3/2 ⁺ ,5/2 ⁺)			
714.1 2	0.7 2	873.40	1/2 ⁺	159.297	1/2 ⁺			E _γ : 714.1γ from 1180-keV level in 1974Hr01.

¹⁰⁴Ru(n,γ) E=th **1978Gu14,1974Hr01** (continued)

γ(¹⁰⁵Ru) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†a}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Comments</u>
						Mult.: A ₂₂ =-0.013 59 and A ₄₄ =-0.006 106 (1978Gu14) or A ₂₂ =-0.015 44 and A ₄₄ =0 (1978Gu14).
716.55 15	0.25 10	824.29	3/2 ⁺	107.913	5/2 ⁺	
^x 736.9 4	0.18 11					
738.3 4	0.17 8	1180.09	(3/2 ⁺ ,5/2 ⁺)	441.86	3/2 ⁺ ,5/2 ⁺	
739.35 15	0.9 1	903.13		163.774	(5/2 ⁺)	
757.20 15	0.83 8	1058.82	(3/2 ⁺ ,5/2,7/2 ⁺)	301.65	7/2 ⁺	E _γ : 757.2γ placed from 757-keV state in 1974Hr01.
763.5 2	0.12 7	784.49	(1/2,3/2) ⁻	20.567	5/2 ⁺	γ not placed in the level scheme in 1978Gu14, but in 1974Hr01.
^x 778.2 4	0.09 7					
^x 792.4 2	0.52 5					
^x 796.2 4	0.08 5					
797.4 2	0.37 6	956.63	(1/2 ⁺ ,3/2,5/2 ⁺)	159.297	1/2 ⁺	
803.8 4	0.15 10	824.29	3/2 ⁺	20.567	5/2 ⁺	
^x 804.9 4	0.30 10					
^x 813.0 2	0.17 5					
824.45 15	0.68 10	824.29	3/2 ⁺	0.0	3/2 ⁺	
829.2 4	0.04 3	1058.82	(3/2 ⁺ ,5/2,7/2 ⁺)	229.47	7/2 ⁺	
^x 831.5 4	0.07 5					
^x 839.3 4	0.09 3					
847.8 4	0.24 11	1735.21	(1/2 ⁺ ,3/2 ⁺)	886.52	3/2 ⁺	
848.65 20	0.32 10	956.63	(1/2 ⁺ ,3/2,5/2 ⁺)	107.913	5/2 ⁺	
862.85 20	0.32 8	1328.98	(1/2 ⁺ ,3/2 ⁺)	466.04	3/2 ⁺	
^x 867.2 4	0.25 12					
878.5 ^c 2	0.39 ^c 10	1180.09	(3/2 ⁺ ,5/2 ⁺)	301.65	7/2 ⁺	
878.5 ^c 2	0.39 ^c 10	1845.5	(1/2 ⁺ ,3/2 ⁺)	967.16	(1/2 ⁺ ,3/2 ⁺)	
887.3 3	0.12 4	1328.98	(1/2 ⁺ ,3/2 ⁺)	441.86	3/2 ⁺ ,5/2 ⁺	
^x 889.0 3	0.12 5					
894.9 4	0.25 12	1058.82	(3/2 ⁺ ,5/2,7/2 ⁺)	163.774	(5/2 ⁺)	
^x 895.7 3	0.22 15					
^x 896.5 3	0.31 15					
^x 909.1 4	0.2 1					
950.3 4	0.21 8	1180.09	(3/2 ⁺ ,5/2 ⁺)	229.47	7/2 ⁺	
971.7 4	0.07 4	1134.57	(1/2 ⁺ to 7/2 ⁺)	163.774	(5/2 ⁺)	
1004.1 [‡] 4	0.57 [‡] 15	1325.39	(1/2,3/2)	321.531	3/2 ⁻	
1008.2 [‡] 4	0.53 [‡] 18	1832.5	(1/2,3/2)	824.29	3/2 ⁺	
^x 1017.6 [‡] 4	0.20 [‡] 12					
1090.7 [‡] 4	0.83 [‡] 21	1735.21	(1/2 ⁺ ,3/2 ⁺)	644.02	(1/2 to 7/2)	
^x 1131.8 [‡] 4	0.7 [‡] 3					
1135.3 [‡] 4	0.42 [‡] 16	1134.57	(1/2 ⁺ to 7/2 ⁺)	0.0	3/2 ⁺	
1159.5 [‡] 5	0.41 [‡] 17	1180.09	(3/2 ⁺ ,5/2 ⁺)	20.567	5/2 ⁺	
1321.8 [‡] 5	0.32 [‡] 11	2380.6	(1/2 ⁺ ,3/2 ⁺)	1058.82	(3/2 ⁺ ,5/2,7/2 ⁺)	

$\gamma(^{105}\text{Ru})$ (continued)

E_γ †	I_γ † ^a	E_i (level)	J_i^π	E_f	J_f^π
1534.1 †	5 0.9 †	3 1693.4	(1/2 ⁺ ,3/2 ⁺)	159.297	1/2 ⁺
1575.3 †	6 0.39 †	17 1735.21	(1/2 ⁺ ,3/2 ⁺)	159.297	1/2 ⁺
1823.8 †	6 0.11 †	5 1845.5	(1/2 ⁺ ,3/2 ⁺)	20.567	5/2 ⁺
1826.3 †	6 0.32 †	12 2404.4	(1/2 ⁻ ,3/2 ⁻)	578.04	5/2 ⁻
^x 1907.3 †	6 0.22 †	8			
1910.5 †	5 0.38 †	10 2352.5	(1/2 ⁺ ,3/2 ⁺)	441.86	3/2 ⁺ ,5/2 ⁺
^x 1926.7 †	6 0.15 †	8			
^x 1930.9 †	7 0.07 †	4			
^x 2039.6 †	5 0.68 †	20			
^x 2044.2 †	6 0.14 †	6			
^x 2088.6 †	6 0.35 †	14			
^x 2092.4 †	6 0.37 †	15			
2127.6 †	5 0.32 †	10 2148.2	(3/2 ⁺)	20.567	5/2 ⁺
^x 2156.4 †	6 0.75 †	25			
^x 2162.1 †	7 0.62 †	21			
^x 2288.9 †	6 0.96 †	20			
^x 2302.3 †	6 0.31 †	15			
^x 2307.8 †	6 0.46 †	22			
2332.1 †	6 0.21 †	8 2352.5	(1/2 ⁺ ,3/2 ⁺)	20.567	5/2 ⁺
^x 2336.3 †	7 0.11 †	6			
^x 2357.1 †	7 0.15 †	8			
^x 2366.0 †	7 0.26 †	12			
^x 2375.0 †	7 0.20 †	8			
^x 2392.7 †	7 0.36 †	17			
^x 2398.4 †	7 0.23 †	12			
^x 2440.4 †	6 0.82 †	25			
^x 2451.8 †	6 0.87 †	21			
^x 2550.2 †	8 0.29 †	14			
^x 2578.0 †	7 0.45 †	13			
^x 2689.6 †	7 0.31 †	15			
^x 2721.1 †	6 0.43 †	12			
^x 2746.3 †	7 0.24 †	9			
^x 2799.3 †	8 0.31 †	15			
^x 2814.2 †	8 0.20 †	8			
^x 2890.2 †	7 0.22 †	12			

γ(¹⁰⁵Ru) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†a}</u>	<u>E_i(level)</u>	<u>Comments</u>
x3298.8 [‡] 7	0.24 [‡] 11		
x3300.9 [‡] 7	0.55 [‡] 20		
x3340.1 [‡] 6	0.28 [‡] 10		
x3345.3 [‡] 6	0.62 [‡] 21		
x3405.7 [‡] 6	0.55 [‡] 22		
x3475.0 [‡] 9	0.42 [‡] 21		
x3482.5 6	0.78 23		E _γ ,I _γ : From 1974Hr01.
x3492.3 6	0.66 20		E _γ ,I _γ : from 1974Hr01.
x3523.7 7	0.18 7		
x3539.5 6	0.36 12		
x3720.7 7	0.34 7		
x3776.2 7	0.24 8		
x5528 ^{#d} 4	0.5 [@] 3		
x5787 ^{#d} 4	0.38 [@] 15		

[†] From 1978Gu14, unless otherwise noted.

[‡] From 1974Hr01.

[#] Observed only by 1974Ba22.

[@] From 1974Ba22. Relative intensities of 1974Ba22 have been renormalized to I(5023γ)=12.5.

[&] From 1978Gu14, based on γ-γ(θ).

^a Intensity per 100 neutron captures.

^b Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^c Multiply placed with undivided intensity.

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

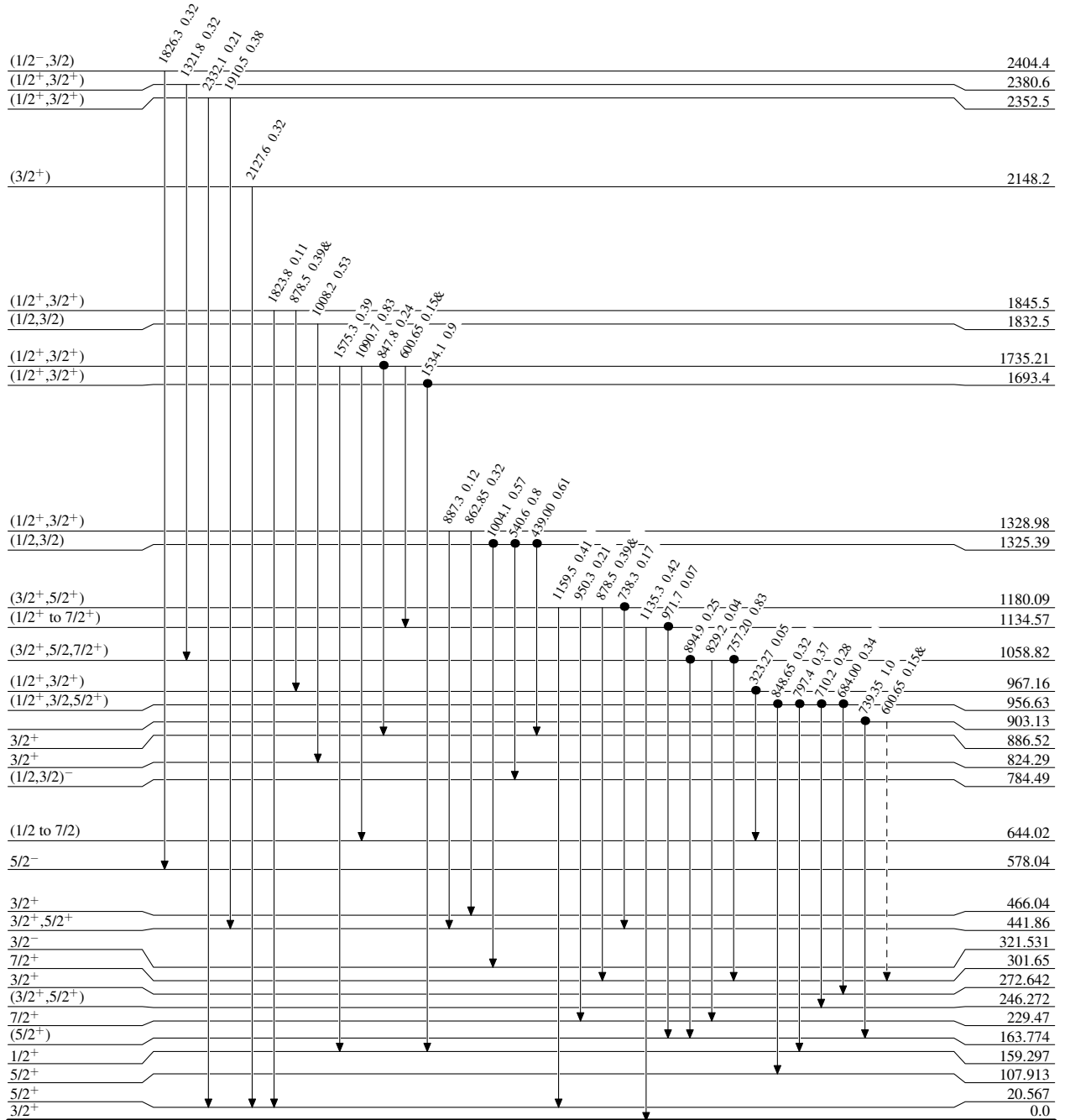
^x γ ray not placed in level scheme.

¹⁰⁴Ru(n,γ) E=th 1978Gu14,1974Hr01

Legend

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

- I_γ < 2% × I_γ^{max}
- I_γ < 10% × I_γ^{max}
- I_γ > 10% × I_γ^{max}
- - - - - → γ Decay (Uncertain)
- Coincidence



¹⁰⁵Ru₆₁

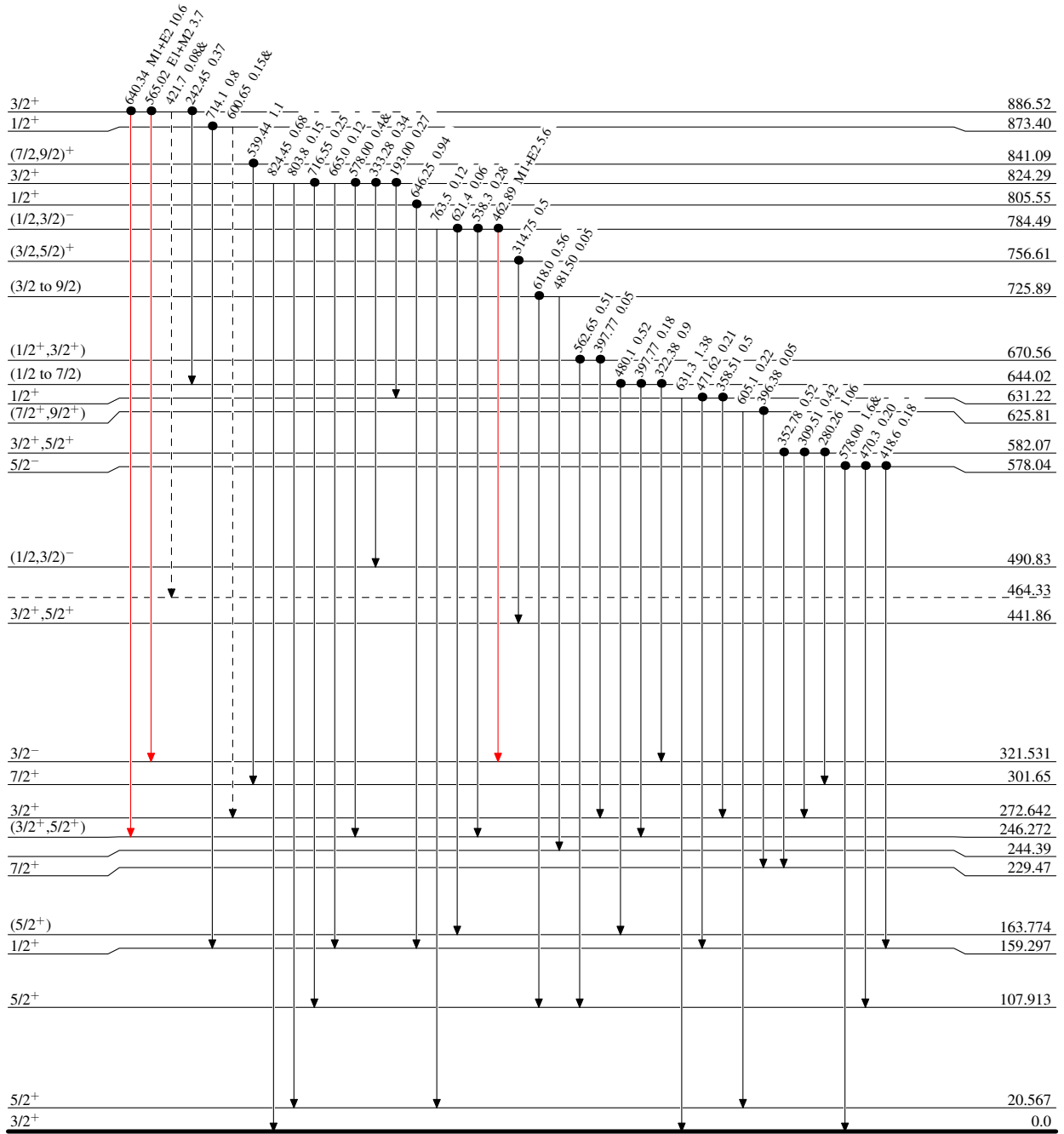
¹⁰⁴Ru(n,γ) E=th 1978Gu14,1974Hr01

Legend

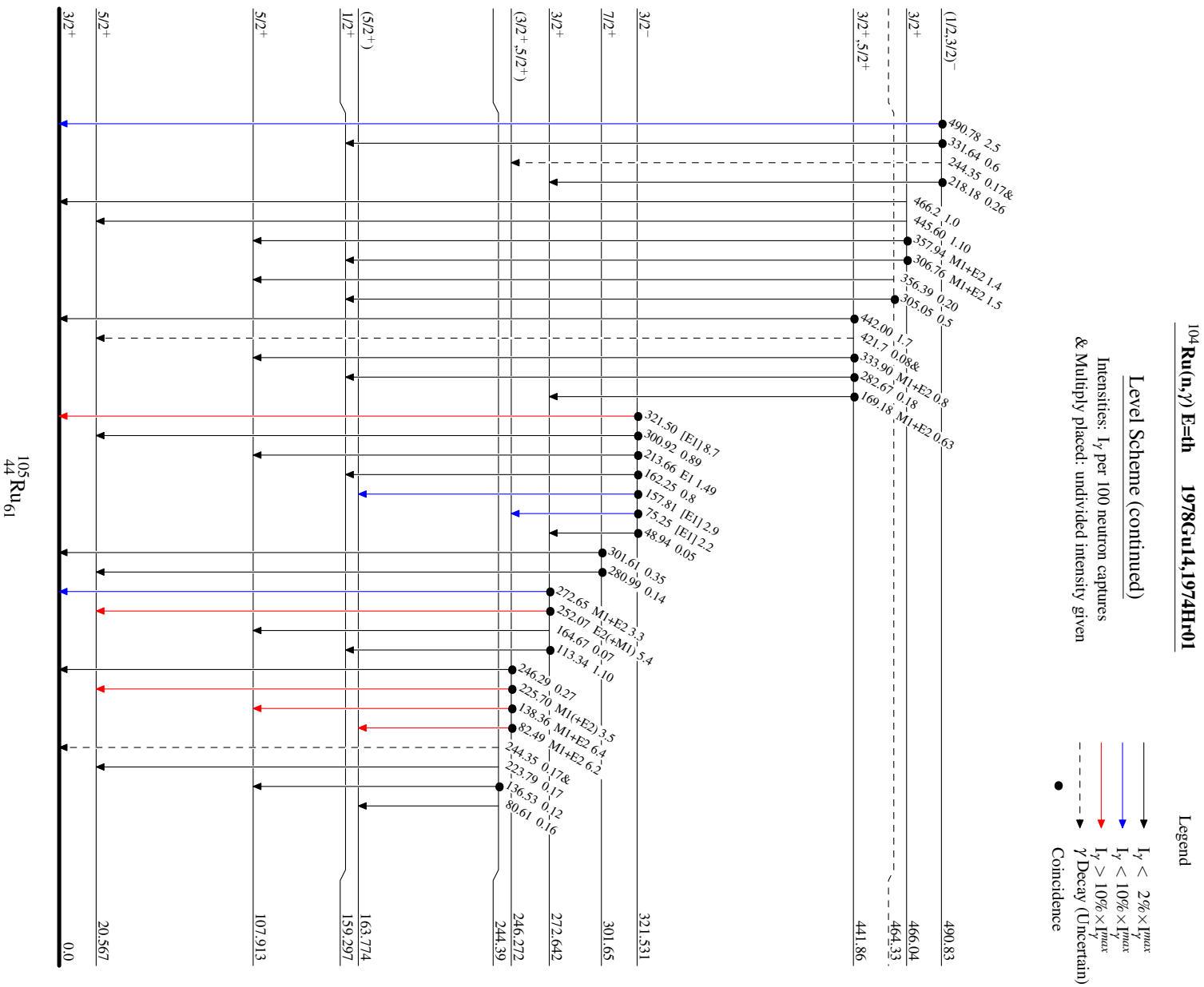
Level Scheme (continued)

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

- I_γ < 2% × I_γ^{max}
- I_γ < 10% × I_γ^{max}
- I_γ > 10% × I_γ^{max}
- - - - - γ Decay (Uncertain)
- Coincidence



¹⁰⁵Ru₆₁



$^{104}\text{Ru}(n,\gamma) \text{ E=th}$ 1978Gu14,1974Hr01

Level Scheme (continued)

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

Legend

- \blackrightarrow $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $\color{blue}\blackrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $\color{red}\blackrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- \bullet Coincidence

