(HI,xnγ) 2014Ku20

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 145, 25 (2017)	1-Jul-2017

All Data are from 2014Ku20 which is extension of earlier level schemes of 2013Su15 and 2000Si05.
2014Ku20: ^{75}As(^{28}Si,2n2pγ) E(^{28}Si)=120 MeV beam was provided by the 15UD Pelletron facility at IUAC, New Delhi. Target=3 mg/cm^2 on a 10 mg/cm^2 thick Pb backing. Measured Eγ, Iγ, γγ-coin, γγ(θ)(DCO), γγ(linear polarization) from oriented nuclei using INGA array of 18 Clover Ge detectors. Deduced high-spin levels, J, π, multipolarity, configurations, bands, alignments, Routhian plots. Comparison with cranked Nilsson Strutinsky (CNS) calculations.

2013Su15: ^{68}Zn(^{37}Cl,α2nγ) E(^{37}Cl)=125 MeV beam provided by the tandem accelerator at JAEA. Target=9 mg/cm^2 thick enriched ^{68}Zn foil. Measured Eγ, Iγ, γγ-coin, γγ(θ)(ADO ratios) using GEMINI array of 12 HPGe detectors with bismuth germanate Compton suppressors. Deduced high-spin levels, J, π, multipolarities, bands, B(M1)/B(E2) ratios. The following levels in 2013Su15 level scheme were not adopted: 4328.3 27/2$^-$, 4859.0 29/2$^-$, 5196.3 31/2$^-$, 5456.0 31/2$^+$, 5682.3 33/2$^+$, 6661.2 35/2$^+$, 6887.6 37/2$^+$.

2000Si05: ^{66}Zn(^{37}Cl,2p2nγ) E=130 MeV. Measured Eγ, γγ, Iγ, and γγ(θ)(DCO) using the Gamma Detector Array of 8 Compton-suppressed HPGe detectors and a 14 element BGO multiplicity filter. Target: 99% enriched ^{66}Zn. The following levels in 2013SU15 level scheme were not adopted: 3015.5 21/2, 4131.3 25/2, 4325.9 27/2, 4856.4 29/2, 5116.3 27/2, 5193.7 31/2, 5679.1 33/2, 5683.0 33/2, 5743.5, 5783.8 33/2, 5943, 6111.4 35/2$^+$, 6884.2 37/2$^+$, 7957.3 41/2$^+$, 9085.3 45/2$^+$, 10282.6 49/2$^+$.

1994Ra07: ^{89}Y(^{16}O,α2nγ) E=60-80 MeV. Measured: γ, excit, γγ, γ(θ). The levels at E=5782.6, 31/2; 7123.5, 35/2; 8015.5, 37/2 are proposed but not adopted.

1997AdZV: ^{90}Zr(^{12}C,p2nγ),^{91}Zr(^{11}B,3nγ); E(^{12}C)=56 MeV. Measured: excitation functions, ^{12}C,γ(θ), γγ. The observed cascades were erroneously assigned to ^{90}Zr(^{12}C,3nγ)^{99}Pd but later shown to be due to ^{99}Rh (1978Lu02). Also 1977Pi01 assigned this cascade to Z≤45.

1978Lu02: ^{90}Zr(^{12}C,p2nγ), ^{91}Zr(^{11}B,3nγ) E(^{12}C)=56 MeV. E(^{11}B)=40 MeV. Measured Eγ, pγ. 1975Ki13 measured linear polarization of γ transitions which were erroneously assigned to ^{99}Pd (1978Lu02). Since 1975Ki13 adopted the ^{99}Pd spin sequence in their analysis, their analysis does not apply to ^{99}Rh γ's.

^{99}Rh Levels

Configurations are discussed in detail by 2014Ku20 based on comparisons of band structures with alignments and Routhian plots from tilted-axis cranking (TAC) calculations, as well as from cranked Nilsson-Strutinsky (CNS) formalism.

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0[d]	1/2$^-$	16.1 d *2*	
63.9[&] *10*	9/2$^+$	4.7 h *1*	%ε+%β$^+$>99.84; %IT<0.16
200.5[a] *5*	(7/2)$^+$		E(level),Jπ: level taken from Adopted Levels.
427.1[d] *5*	5/2$^-$		
782.5[a] *12*	11/2$^+$		
841.9[&] *10*	13/2$^+$		
979.1[d] *7*	9/2$^-$		
1654.9[@] *15*	(17/2$^+$)		
1660.1[a] *12*	15/2$^+$		
1660.2[d] *9*	13/2$^-$		
1701.7[&] *11*	17/2$^+$		
2194.9[a] *11*	19/2$^+$		

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(HI,xnγ) 2014Ku20 (continued)

^{99}Rh Levels (continued)

E(level)[†]	Jπ[‡]
2300.0[d] *12*	17/2⁻
2504.7[@] *18*	(21/2⁺)
2508.1 *16*	(17/2⁻)
2593.2[&] *11*	21/2⁺
2619.8 *12*	17/2⁻
2890.2[b] *11*	21/2⁺
3113.2[d] *12*	21/2⁻
3149.9[a] *11*	23/2⁺
3433.5[e] *13*	21/2⁻
3547.4 *13*	21/2⁻
3586.5[&] *11*	25/2⁺
3633.2 *16*	
3698.1[c] *12*	23/2⁺
3710.6[f] *11*	23/2⁻
3878.2[b] *12*	25/2⁺
3988.8[e] *11*	25/2⁻
4005.6[c] *13*	25/2⁺
4098.5[d] *13*	25/2⁻
4249.5[b] *12*	27/2⁺
4264.0[a] *11*	27/2⁺
4328.4 *14*	(25/2⁻)
4579.6[f] *12*	27/2⁻
4628.0[&] *12*	29/2⁺
4678.0[c] *12*	27/2⁺
4690.2 *12*	29/2⁺
4825.3[b] *12*	29/2⁺
4916.9[e] *12*	29/2⁻
4961.3 *13*	27/2⁺
5113.4[c] *14*	29/2⁺
5145.9[d] *13*	29/2⁻
5319.9[a] *12*	31/2⁺
5366.9 *12*	29/2⁺
5447.5[f] *12*	31/2⁻
5517.8 *13*	29/2⁺
5693.9 *14*	(33/2⁺)
5701.2[&] *12*	33/2⁺
5785.2[e] *12*	33/2⁻
5826.3[c] *12*	31/2⁺
5972.6[b] *12*	31/2⁺
6299.9[d] *14*	33/2⁻
6665.7[f] *13*	35/2⁻
6829.1[&] *13*	37/2⁺
6878.9[c] *12*	35/2⁺
7126.9[e] *12*	37/2⁻
7282.0 *17*	
7302.5 *14*	37/2⁺
7461.9 *16*	
7675.9[d] *17*	37/2⁻
7871.6 *15*	(35/2⁺)

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(HI,xnγ) 2014Ku20 (continued)

^{99}Rh Levels (continued)

E(level)[†]	Jπ[‡]	Comments
7894.5[f] *13*	39/2⁻	
8018.6[e] *13*	41/2⁻	
8024.0 *17*		
8084.5 *13*	(37/2⁺)	
8319.2[&] *16*	41/2⁺	
8331.1 *16*		
8448.1 *16*		
8868.4[f] *13*	43/2⁻	
9336.3 *14*	(39/2)	
9482.6 *15*	43/2⁻	
9587.1 *19*		E(level): 9686 listed in table 1 and figure 1 of 2014Ku20 is a misprint if Eγ=1256 keV from this level is correct.
9766.6 *16*		
9957.6[e] *14*	45/2⁻	
9973.1 *15*	(43/2⁻)	
10174.2 *14*	45/2⁻	
10225.7[&] *19*	(45/2⁺)	
10380.1 *16*	(41/2)	
10738.1 *17*		
10989.9 *16*	(43/2)	
11054.4[h] *14*	(45/2,47/2)⁻	
11610.2 *15*		
11622.2[g] *15*	47/2⁻	
12178.1 *20*		
12302.1 *20*		
12414.0 *19*	(47/2)	
12478.5[h] *15*	(49/2,51/2)⁻	
12542.1[g] *18*	(51/2⁻)	
12577.9 *19*		
13397.9[h] *18*	(53/2,55/2)⁻	
13729.1 *23*		
13922.4 *21*		
14904.9 *21*		
15013.9[h] *21*	(57/2,59/2)⁻	
15014.5[g] *20*	(55/2⁻)	
15175.4 *23*		
15341.9 *21*	(57/2,59/2)⁻	
16308.9 *23*	(61/2,63/2)⁻	
16625.9 *23*		
16743.9 *23*		
16875.9 *23*		
16959.9[h] *23*	(61/2,63/2)⁻	

† From least-squares fit to Eγ data.
‡ From 2014Ku20 based on band assignments and band head configurations.
# From Adopted Levels.
@ Possible γ-vibrational state as discussed in 2014Ku20.
& Band(A): π5/2[422] band, α=+1/2. Based on $g_{9/2}$ proton orbital. Crossings observed at ħω≈0.40 and 0.50 MeV. Several scenarios are discussed in 2014Ku20 for these crossings, including possible terminating 5-qp state at 33/2⁺.
a Band(a): π5/2[422] band, α=−1/2. Based on $g_{9/2}$ proton orbital.

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(HI,xnγ) 2014Ku20 (continued)

^{99}Rh Levels (continued)

[b] Band(B): Band based on $21/2^+$. Configuration=$\pi g_{9/2}\otimes\nu g_{7/2}\otimes\nu d_{5/2}$.
[c] Band(C): Band based on $23/2^+$. Configuration=$\pi p_{1/2}\otimes\nu h_{11/2}\otimes\nu d_{5/2}$.
[d] Band(D): Band based on $1/2^-$. Configuration=$\pi p_{1/2}\otimes\nu g^2_{7/2}$.
[e] Band(E): Band based on $21/2^-$,α=+1/2. Configuration=$\pi g_{9/2}\otimes\nu h_{11/2}\otimes\nu g_{7/2}$.
[f] Band(e): Band based on $23/2^-$,α=−1/2. Configuration=$\pi g_{9/2}\otimes\nu h_{11/2}\otimes\nu g_{7/2}$.
[g] Band(F): Band based on $47/2^-$. Configuration=$\pi g_{9/2}\otimes\nu h_{11/2}\otimes\nu(g_{7/2}$ or $d_{5/2})$.
[h] Band(G): Band based on $(45/2,47/2)^-$. Configuration=$\pi g_{9/2}\otimes\nu h_{11/2}\otimes\nu(g_{7/2}$ or $d_{5/2})$.

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$

DCO ratios correspond to gates on ΔJ=2, quadrupole transitions, expected DCO values are ≥1.0 for ΔJ=2, quadrupole, and ≤0.6 for ΔJ=1, dipole transitions.
Integrated polarization directional correlation from oriented nuclei measurements (IPDCO) done to determine nature of transitions (2014Ku20).

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[#]	Comments
124		8018.6	41/2$^-$	7894.5	39/2$^-$			E_γ: from level-scheme figure 1 of 2014Ku20 only. In authors′ table 1, 124.9γ is listed only from 5826 level.
124.9 *10*	0.22 *4*	5826.3	31/2$^+$	5701.2	33/2$^+$	M1	0.185 *5*	α(K)=0.161 *5*; α(L)=0.0195 *6*; α(M)=0.00364 *10* α(N)=0.000602 *16*; α(O)=3.01×10^{-5} *8*
163.1 *10*	0.30 *6*	3710.6	23/2$^-$	3547.4	21/2$^-$	M1	0.0891 *20*	α(K)=0.0777 *17*; α(L)=0.00936 *21*; α(M)=0.00174 *4* α(N)=0.000289 *7*; α(O)=1.45×10^{-5} *4*
212.9 *10*	0.37 *7*	8084.5	(37/2$^+$)	7871.6	(35/2$^+$)	(M1)	0.0438 *9*	α(K)=0.0382 *8*; α(L)=0.00457 *9*; α(M)=0.000850 *16* α(N)=0.000141 *3*; α(O)=7.11×10^{-6} *14*
216.6 *5*	2.72 *27*	10174.2	45/2$^-$	9957.6	45/2$^-$			
230.0 *10*	0.052 *11*	4328.4	(25/2$^-$)	4098.5	25/2$^-$			
259.6 *10*	0.90 *15*	3149.9	23/2$^+$	2890.2	21/2$^+$	M1	0.0261 *5*	α(K)=0.0228 *4*; α(L)=0.00271 *5*; α(M)=0.000504 *9* α(N)=8.36×10^{-5} *15*; α(O)=4.23×10^{-6} *8*
277.1 *10*	0.11 *2*	3710.6	23/2$^-$	3433.5	21/2$^-$	M1	0.0221 *4*	α(K)=0.0193 *4*; α(L)=0.00229 *4*; α(M)=0.000425 *8* α(N)=7.05×10^{-5} *12*; α(O)=3.58×10^{-6} *6*
278.5 *3*	35.3 *20*	3988.8	25/2$^-$	3710.6	23/2$^-$	M1	0.0218	DCO=0.50 *4* α(K)=0.0190 *3*; α(L)=0.00226 *4*; α(M)=0.000419 *6* α(N)=6.96×10^{-5} *10*; α(O)=3.53×10^{-6} *5* IPDCO=−0.04 *1*.
296.8 *10*	1.72 *20*	2890.2	21/2$^+$	2593.2	21/2$^+$			
307.6 *10*	1.74 *20*	4005.6	25/2$^+$	3698.1	23/2$^+$	M1	0.0169 *3*	α(K)=0.01477 *24*; α(L)=0.00175 *3*; α(M)=0.000325 *6* α(N)=5.39×10^{-5} *9*; α(O)=2.74×10^{-6} *5*
308.5 *10*	0.67 *10*	5826.3	31/2$^+$	5517.8	29/2$^+$	M1	0.0168 *3*	α(K)=0.01466 *24*; α(L)=0.00173 *3*; α(M)=0.000322 *6* α(N)=5.35×10^{-5} *9*; α(O)=2.72×10^{-6} *5*
319.6 *10*	0.11 *2*	2619.8	17/2$^-$	2300.0	17/2$^-$			
320.3 *10*	0.18 *3*	3433.5	21/2$^-$	3113.2	21/2$^-$			
329.6 *10*	0.14 *3*	4579.6	27/2$^-$	4249.5	27/2$^+$	E1	0.00511 *9*	α(K)=0.00448 *8*; α(L)=0.000518 *9*; α(M)=9.57×10^{-5} *16* α(N)=1.58×10^{-5} *3*; α(O)=7.75×10^{-7} *13*
337.0 *3*	23.7 *17*	4916.9	29/2$^-$	4579.6	27/2$^-$	M1	0.01342	DCO=0.53 *4* α(K)=0.01174 *17*; α(L)=0.001384 *20*; α(M)=0.000257 *4* α(N)=4.27×10^{-5} *6*; α(O)=2.17×10^{-6} *3* IPDCO=−0.03 *1*.
337.7 *3*	20.0 *15*	5785.2	33/2$^-$	5447.5	31/2$^-$	M1	0.01335	DCO=0.47 *4* α(K)=0.01168 *17*; α(L)=0.001377 *20*; α(M)=0.000256 *4* α(N)=4.25×10^{-5} *6*; α(O)=2.16×10^{-6} *3*
364.4 *5*	3.2 *3*	4628.0	29/2$^+$	4264.0	27/2$^+$	M1	0.01104	DCO=0.46 *6* α(K)=0.00966 *14*; α(L)=0.001136 *17*; α(M)=0.000211 *3* α(N)=3.50×10^{-5} *5*; α(O)=1.79×10^{-6} *3*

$^{99}_{45}Rh_{54}$-5

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
371.0 *10*	0.05 *1*	4249.5	$27/2^+$	3878.2	$25/2^+$	M1	0.01056 *17*	α(K)=0.00924 *15*; α(L)=0.001086 *17*; α(M)=0.000202 *4* α(N)=3.35×10^{-5} *6*; α(O)=1.71×10^{-6} *3*
378.7 *10*	0.35 *6*	4628.0	$29/2^+$	4249.5	$27/2^+$	M1	0.01003 *16*	α(K)=0.00878 *14*; α(L)=0.001031 *16*; α(M)=0.000191 *3* α(N)=3.18×10^{-5} *5*; α(O)=1.62×10^{-6} *3*
381.0 *5*	3.3 *3*	5701.2	$33/2^+$	5319.9	$31/2^+$	M1	0.00989	DCO=0.50 *6* α(K)=0.00865 *13*; α(L)=0.001016 *15*; α(M)=0.000189 *3* α(N)=3.13×10^{-5} *5*; α(O)=1.599×10^{-6} *23*
385.9 *10*	1.74 *18*	4264.0	$27/2^+$	3878.2	$25/2^+$	M1	0.00958 *15*	DCO=0.43 *7* α(K)=0.00838 *13*; α(L)=0.000984 *16*; α(M)=0.000183 *3* α(N)=3.03×10^{-5} *5*; α(O)=1.549×10^{-6} *24*
398.4 *3*	20.5 *12*	2593.2	$21/2^+$	2194.9	$19/2^+$	M1	0.00885	DCO=0.56 *4* α(K)=0.00775 *11*; α(L)=0.000909 *13*; α(M)=0.0001687 *24* α(N)=2.80×10^{-5} *4*; α(O)=1.432×10^{-6} *21* IPDCO=−0.05 *1*.
419 *1*	1.65 *20*	4005.6	$25/2^+$	3586.5	$25/2^+$			DCO=0.38 *7*
425.8 *10*	1.52 *18*	4690.2	$29/2^+$	4264.0	$27/2^+$	M1	0.00752	DCO=0.40 *7* α(K)=0.00658 *10*; α(L)=0.000770 *12*; α(M)=0.0001430 *22* α(N)=2.38×10^{-5} *4*; α(O)=1.215×10^{-6} *19*
427.1 *5*	4.6 *4*	427.1	$5/2^-$	0.0	$1/2^-$	E2	0.00907	DCO=0.93 *10* α(K)=0.00784 *12*; α(L)=0.001005 *15*; α(M)=0.000187 *3* α(N)=3.05×10^{-5} *5*; α(O)=1.362×10^{-6} *20*
428.0 *10*	0.38 *6*	4678.0	$27/2^+$	4249.5	$27/2^+$			
434.4 *10*	0.23 *4*	3547.4	$21/2^-$	3113.2	$21/2^-$			
435.2 *10*	1.12 *15*	5113.4	$29/2^+$	4678.0	$27/2^+$	M1	0.00713	α(K)=0.00624 *10*; α(L)=0.000730 *11*; α(M)=0.0001355 *21* α(N)=2.25×10^{-5} *4*; α(O)=1.152×10^{-6} *18*
436.0 *5*	6.1 *5*	3586.5	$25/2^+$	3149.9	$23/2^+$	M1	0.00710	DCO=0.57 *5* α(K)=0.00621 *9*; α(L)=0.000727 *11*; α(M)=0.0001349 *20* α(N)=2.24×10^{-5} *4*; α(O)=1.147×10^{-6} *17*
459.5 *5*	3.6 *3*	5826.3	$31/2^+$	5366.9	$29/2^+$	M1	0.00625	DCO=0.59 *6* α(K)=0.00547 *8*; α(L)=0.000639 *10*; α(M)=0.0001185 *17* α(N)=1.97×10^{-5} *3*; α(O)=1.009×10^{-6} *15*
461.3 *10*	1.27 *17*	7126.9	$37/2^-$	6665.7	$35/2^-$	M1	0.00619	DCO=0.51 *9* α(K)=0.00542 *9*; α(L)=0.000633 *10*; α(M)=0.0001174 *18* α(N)=1.95×10^{-5} *3*; α(O)=9.99×10^{-7} *15*
473.4 *10*	0.18 *4*	7302.5	$37/2^+$	6829.1	$37/2^+$			
475.0 *10*	0.48 *8*	9957.6	$45/2^-$	9482.6	$43/2^-$	M1	0.00577	α(K)=0.00505 *8*; α(L)=0.000589 *9*; α(M)=0.0001093 *17* α(N)=1.82×10^{-5} *3*; α(O)=9.31×10^{-7} *14*
493.2 *3*	48.3 *26*	2194.9	$19/2^+$	1701.7	$17/2^+$	M1	0.00527	DCO=0.53 *4* α(K)=0.00461 *7*; α(L)=0.000537 *8*; α(M)=9.97×10^{-5} *14* α(N)=1.657×10^{-5} *24*; α(O)=8.50×10^{-7} *12* IPDCO=−0.06 *2*.
495 *1*	0.42 *7*	5319.9	$31/2^+$	4825.3	$29/2^+$	M1	0.00522	α(K)=0.00457 *7*; α(L)=0.000533 *8*; α(M)=9.88×10^{-5} *15* α(N)=1.643×10^{-5} *25*; α(O)=8.43×10^{-7} *13*

$^{99}_{45}Rh_{54}$-6

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
520.0 *10*	0.048 *6*	3633.2		3113.2	$21/2^-$			
524.5 *10*	0.63 *10*	13922.4		13397.9	$(53/2,55/2)^-$			
530.5 *3*	22.8 *14*	5447.5	$31/2^-$	4916.9	$29/2^-$	M1	0.00442	DCO=0.54 *4* α(K)=0.00388 *6*; α(L)=0.000451 *7*; α(M)=8.36×10^{-5} *12* α(N)=1.390×10^{-5} *20*; α(O)=7.14×10^{-7} *10* IPDCO=−0.04 *1*.
535 *1*	1.12 *14*	2194.9	$19/2^+$	1660.1	$15/2^+$	E2	0.00465	α(K)=0.00404 *6*; α(L)=0.000501 *8*; α(M)=9.32×10^{-5} *14* α(N)=1.529×10^{-5} *23*; α(O)=7.11×10^{-7} *11*
548.4 *10*	0.73 *10*	3698.1	$23/2^+$	3149.9	$23/2^+$			
551.4 *10*	0.22 *4*	4098.5	$25/2^-$	3547.4	$21/2^-$	E2	0.00427	α(K)=0.00371 *6*; α(L)=0.000458 *7*; α(M)=8.52×10^{-5} *13* α(N)=1.399×10^{-5} *21*; α(O)=6.54×10^{-7} *10*
552.0 *5*	2.89 *25*	979.1	$9/2^-$	427.1	$5/2^-$	E2	0.00426	DCO=0.97 *6* α(K)=0.00370 *6*; α(L)=0.000457 *7*; α(M)=8.49×10^{-5} *13* α(N)=1.395×10^{-5} *20*; α(O)=6.52×10^{-7} *10* IPDCO=+0.10 *4*.
555.4 *10*	0.18 *3*	3988.8	$25/2^-$	3433.5	$21/2^-$	E2	0.00418	α(K)=0.00364 *6*; α(L)=0.000449 *7*; α(M)=8.34×10^{-5} *13* α(N)=1.370×10^{-5} *21*; α(O)=6.41×10^{-7} *10*
556.6 *5*	6.70 *48*	3149.9	$23/2^+$	2593.2	$21/2^+$	M1	0.00395	DCO=0.54 *7* α(K)=0.00346 *5*; α(L)=0.000402 *6*; α(M)=7.45×10^{-5} *11* α(N)=1.238×10^{-5} *18*; α(O)=6.36×10^{-7} *9*
561.3 *10*	0.50 *8*	3710.6	$23/2^-$	3149.9	$23/2^+$	E1	1.36×10^{-3}	α(K)=0.001195 *18*; α(L)=0.0001368 *20*; α(M)=2.53×10^{-5} *4* α(N)=4.19×10^{-6} *7*; α(O)=2.11×10^{-7} *3*
576.0 *10*	0.64 *10*	4825.3	$29/2^+$	4249.5	$27/2^+$	M1	0.00364	α(K)=0.00319 *5*; α(L)=0.000370 *6*; α(M)=6.86×10^{-5} *10* α(N)=1.141×10^{-5} *17*; α(O)=5.87×10^{-7} *9*
579 *1*	0.055 *11*	6878.9	$35/2^+$	6299.9	$33/2^-$	E1	1.27×10^{-3}	α(K)=0.001113 *17*; α(L)=0.0001273 *19*; α(M)=2.35×10^{-5} *4* α(N)=3.90×10^{-6} *6*; α(O)=1.97×10^{-7} *3*
583 *1*	0.008 *2*	7461.9		6878.9	$35/2^+$			
590.7 *3*	21.2 *12*	4579.6	$27/2^-$	3988.8	$25/2^-$	M1	0.00343	DCO=0.54 *4* α(K)=0.00301 *5*; α(L)=0.000349 *5*; α(M)=6.46×10^{-5} *9* α(N)=1.075×10^{-5} *16*; α(O)=5.53×10^{-7} *8* IPDCO=−0.05 *1*.
597.4 *10*	0.23 *4*	3710.6	$23/2^-$	3113.2	$21/2^-$	M1	0.00334	α(K)=0.00293 *5*; α(L)=0.000339 *5*; α(M)=6.29×10^{-5} *10* α(N)=1.046×10^{-5} *16*; α(O)=5.38×10^{-7} *8*
598.4 *10*	0.38 *6*	2300.0	$17/2^-$	1701.7	$17/2^+$	E1	1.18×10^{-3}	α(K)=0.001033 *15*; α(L)=0.0001180 *18*; α(M)=2.18×10^{-5} *4* α(N)=3.62×10^{-6} *6*; α(O)=1.82×10^{-7} *3*
605.4 *10*	1.45 *18*	5972.6	$31/2^+$	5366.9	$29/2^+$	M1	0.00324	α(K)=0.00284 *5*; α(L)=0.000329 *5*; α(M)=6.10×10^{-5} *9* α(N)=1.014×10^{-5} *15*; α(O)=5.22×10^{-7} *8*
609.8 *10*	0.61 *10*	10989.9	(43/2)	10380.1	(41/2)	(M1)	0.00318	α(K)=0.00279 *4*; α(L)=0.000323 *5*; α(M)=5.99×10^{-5} *9* α(N)=9.97×10^{-6} *15*; α(O)=5.13×10^{-7} *8*
629.8 *10*	0.96 *14*	5319.9	$31/2^+$	4690.2	$29/2^+$	M1	0.00295	α(K)=0.00259 *4*; α(L)=0.000299 *5*; α(M)=5.55×10^{-5} *8* α(N)=9.23×10^{-6} *14*; α(O)=4.76×10^{-7} *7*
639.9 *5*	2.25 *26*	2300.0	$17/2^-$	1660.2	$13/2^-$	E2	0.00283	DCO=1.01 *14*

$^{99}_{45}Rh_{54}$-7

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
								α(K)=0.00247 *4*; α(L)=0.000300 *5*; α(M)=5.57×10^{-5} *8* α(N)=9.17×10^{-6} *13*; α(O)=4.38×10^{-7} *7* IPDCO=+0.09 *3*.
653.0 *10*	0.16 *3*	5972.6	31/2$^+$	5319.9	31/2$^+$			
662.7 *10*	0.33 *6*	4249.5	27/2$^+$	3586.5	25/2$^+$	M1	0.00262	α(K)=0.00230 *4*; α(L)=0.000266 *4*; α(M)=4.93×10^{-5} *8* α(N)=8.19×10^{-6} *12*; α(O)=4.22×10^{-7} *6*
672.4 *10*	0.65 *10*	4678.0	27/2$^+$	4005.6	25/2$^+$	M1	0.00254	DCO=0.57 *11* α(K)=0.00222 *4*; α(L)=0.000257 *4*; α(M)=4.76×10^{-5} *7* α(N)=7.92×10^{-6} *12*; α(O)=4.08×10^{-7} *6*
677.6 *10*	1.34 *18*	4264.0	27/2$^+$	3586.5	25/2$^+$	M1	0.00249	α(K)=0.00218 *4*; α(L)=0.000252 *4*; α(M)=4.68×10^{-5} *7* α(N)=7.78×10^{-6} *12*; α(O)=4.01×10^{-7} *6*
680.4 *10*	0.15 *3*	5826.3	31/2$^+$	5145.9	29/2$^-$	E1	8.85×10^{-4}	α(K)=0.000777 *12*; α(L)=8.85×10^{-5} *13*; α(M)=1.636×10^{-5} *24* α(N)=2.71×10^{-6} *4*; α(O)=1.376×10^{-7} *20*
681.1 *5*	2.67 *30*	1660.2	13/2$^-$	979.1	9/2$^-$	E2	0.00240	DCO=0.83 *15* α(K)=0.00209 *3*; α(L)=0.000253 *4*; α(M)=4.69×10^{-5} *7* α(N)=7.73×10^{-6} *11*; α(O)=3.72×10^{-7} *6* IPDCO=+0.17 *4*.
692.0 *10*	0.93 *12*	5319.9	31/2$^+$	4628.0	29/2$^+$	M1	0.00237	DCO=0.57 *8* α(K)=0.00208 *3*; α(L)=0.000240 *4*; α(M)=4.45×10^{-5} *7* α(N)=7.41×10^{-6} *11*; α(O)=3.82×10^{-7} *6*
695.2 *3*	10.0 *7*	2890.2	21/2$^+$	2194.9	19/2$^+$	M1	0.00235	DCO=0.69 *5* α(K)=0.00206 *3*; α(L)=0.000238 *4*; α(M)=4.41×10^{-5} *7* α(N)=7.33×10^{-6} *11*; α(O)=3.78×10^{-7} *6*
700.9 *10*	1.44 *18*	4579.6	27/2$^-$	3878.2	25/2$^+$	E1	8.30×10^{-4}	α(K)=0.000729 *11*; α(L)=8.30×10^{-5} *12*; α(M)=1.534×10^{-5} *22* α(N)=2.54×10^{-6} *4*; α(O)=1.291×10^{-7} *19*
712.8 *10*	0.85 *12*	5826.3	31/2$^+$	5113.4	29/2$^+$	M1	0.00222	α(K)=0.00194 *3*; α(L)=0.000224 *4*; α(M)=4.16×10^{-5} *6* α(N)=6.91×10^{-6} *10*; α(O)=3.57×10^{-7} *6*
719.0 *10*		782.5	11/2$^+$	63.9	9/2$^+$	M1	0.00217	α(K)=0.00191 *3*; α(L)=0.000220 *4*; α(M)=4.07×10^{-5} *6* α(N)=6.78×10^{-6} *10*; α(O)=3.50×10^{-7} *5*
728.2 *5*	4.5 *4*	3878.2	25/2$^+$	3149.9	23/2$^+$	M1	0.00211	DCO=0.62 *6* α(K)=0.00185 *3*; α(L)=0.000213 *3*; α(M)=3.96×10^{-5} *6* α(N)=6.58×10^{-6} *10*; α(O)=3.40×10^{-7} *5*
738.9 *5*	2.05 *24*	5366.9	29/2$^+$	4628.0	29/2$^+$			DCO=0.99 *12*
756.9 *10*	1.27 *16*	5447.5	31/2$^-$	4690.2	29/2$^+$	E1	7.05×10^{-4}	α(K)=0.000619 *9*; α(L)=7.03×10^{-5} *10*; α(M)=1.300×10^{-5} *19* α(N)=2.16×10^{-6} *3*; α(O)=1.098×10^{-7} *16*
767.6 *10*	1.45 *18*	7894.5	39/2$^-$	7126.9	37/2$^-$	M1	0.00187	α(K)=0.001643 *24*; α(L)=0.000189 *3*; α(M)=3.50×10^{-5} *5* α(N)=5.83×10^{-6} *9*; α(O)=3.01×10^{-7} *5*
777.9 *3*	100 *5*	841.9	13/2$^+$	63.9	9/2$^+$	E2	1.71×10^{-3}	DCO=0.90 *8* α(K)=0.001495 *21*; α(L)=0.0001781 *25*; α(M)=3.30×10^{-5} *5* α(N)=5.46×10^{-6} *8*; α(O)=2.67×10^{-7} *4*
811.7 *10*	1.14 *15*	4690.2	29/2$^+$	3878.2	25/2$^+$	E2	1.54×10^{-3}	α(K)=0.001347 *20*; α(L)=0.0001598 *23*; α(M)=2.97×10^{-5} *5* α(N)=4.90×10^{-6} *7*; α(O)=2.41×10^{-7} *4*

$^{99}_{45}Rh_{54}$-8

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
813.0 *10*		1654.9	(17/2$^+$)	841.9	13/2$^+$	(E2)	1.54×10^{-3}	α(K)=0.001342 *20*; α(L)=0.0001592 *23*; α(M)=2.95×10^{-5} *5* α(N)=4.88×10^{-6} *7*; α(O)=2.40×10^{-7} *4*
813.3 *10*	1.61 *21*	3113.2	21/2$^-$	2300.0	17/2$^-$	E2	1.53×10^{-3}	DCO=0.80 *15* α(K)=0.001341 *20*; α(L)=0.0001591 *23*; α(M)=2.95×10^{-5} *5* α(N)=4.87×10^{-6} *7*; α(O)=2.39×10^{-7} *4* IPDCO=+0.12 *4*.
818.0 *10*	0.80 *12*	1660.2	13/2$^-$	841.9	13/2$^+$	E1	6.00×10^{-4}	α(K)=0.000527 *8*; α(L)=5.98×10^{-5} *9*; α(M)=1.106×10^{-5} *16* α(N)=1.83×10^{-6} *3*; α(O)=9.36×10^{-8} *14*
818.4 *10*	1.80 *20*	1660.1	15/2$^+$	841.9	13/2$^+$	M1	1.62×10^{-3}	α(K)=0.001421 *21*; α(L)=0.0001633 *24*; α(M)=3.03×10^{-5} *5* α(N)=5.03×10^{-6} *8*; α(O)=2.60×10^{-7} *4*
820.0 *10*	1.30 *17*	5447.5	31/2$^-$	4628.0	29/2$^+$	E1	5.97×10^{-4}	α(K)=0.000525 *8*; α(L)=5.95×10^{-5} *9*; α(M)=1.100×10^{-5} *16* α(N)=1.83×10^{-6} *3*; α(O)=9.31×10^{-8} *14*
820.4 *5*	9.9 *6*	3710.6	23/2$^-$	2890.2	21/2$^+$	E1	5.96×10^{-4}	DCO=0.51 *5* α(K)=0.000524 *8*; α(L)=5.94×10^{-5} *9*; α(M)=1.099×10^{-5} *16* α(N)=1.82×10^{-6} *3*; α(O)=9.31×10^{-8} *13*
848.0 *10*	0.021 *5*	2508.1	(17/2$^-$)	1660.1	15/2$^+$	(E2)	1.39×10^{-3}	α(K)=0.001212 *18*; α(L)=0.0001433 *21*; α(M)=2.66×10^{-5} *4* α(N)=4.39×10^{-6} *7*; α(O)=2.17×10^{-7} *3*
849.8 *10*	0.40 *8*	2504.7	(21/2$^+$)	1654.9	(17/2$^+$)	(E2)	1.38×10^{-3}	α(K)=0.001206 *18*; α(L)=0.0001425 *21*; α(M)=2.64×10^{-5} *4* α(N)=4.37×10^{-6} *7*; α(O)=2.16×10^{-7} *3*
849.8 *5*	9.8 *6*	8868.4	43/2$^-$	8018.6	41/2$^-$	M1	1.49×10^{-3}	DCO=0.49 *4* α(K)=0.001306 *19*; α(L)=0.0001499 *21*; α(M)=2.78×10^{-5} *4* α(N)=4.62×10^{-6} *7*; α(O)=2.39×10^{-7} *4* IPDCO=−0.08 *3*.
859.8 *3*	94.4 *50*	1701.7	17/2$^+$	841.9	13/2$^+$	E2	1.34×10^{-3}	DCO=0.97 *4* α(K)=0.001173 *17*; α(L)=0.0001385 *20*; α(M)=2.57×10^{-5} *4* α(N)=4.25×10^{-6} *6*; α(O)=2.10×10^{-7} *3* IPDCO=+0.06 *3*.
865.4 *10*	0.51 *9*	5826.3	31/2$^+$	4961.3	27/2$^+$	E2	1.32×10^{-3}	α(K)=0.001155 *17*; α(L)=0.0001363 *20*; α(M)=2.53×10^{-5} *4* α(N)=4.18×10^{-6} *6*; α(O)=2.07×10^{-7} *3*
867.7 *5*	8.6 *6*	5447.5	31/2$^-$	4579.6	27/2$^-$	E2	1.31×10^{-3}	DCO=0.90 *8* α(K)=0.001147 *17*; α(L)=0.0001354 *19*; α(M)=2.51×10^{-5} *4* α(N)=4.15×10^{-6} *6*; α(O)=2.05×10^{-7} *3*
867.8 *10*	1.40 *16*	4579.6	27/2$^-$	3710.6	23/2$^-$	E2	1.31×10^{-3}	DCO=0.96 *15* α(K)=0.001147 *17*; α(L)=0.0001354 *20*; α(M)=2.51×10^{-5} *4* α(N)=4.15×10^{-6} *6*; α(O)=2.05×10^{-7} *3*
868.6 *5*	4.0 *2*	5785.2	33/2$^-$	4916.9	29/2$^-$	E2	1.31×10^{-3}	DCO=0.76 *12* α(K)=0.001145 *17*; α(L)=0.0001351 *19*; α(M)=2.50×10^{-5} *4* α(N)=4.14×10^{-6} *6*; α(O)=2.05×10^{-7} *3*
878.1 *10*	0.44 *8*	1660.2	13/2$^-$	782.5	11/2$^+$	E1	5.20×10^{-4}	α(K)=0.000457 *7*; α(L)=5.18×10^{-5} *8*; α(M)=9.57×10^{-6} *14* α(N)=1.588×10^{-6} *23*; α(O)=8.12×10^{-8} *12*
880 *1*	0.25 *4*	11054.4	(45/2,47/2)$^-$	10174.2	45/2$^-$			
880.6 *5*	2.70 *25*	6665.7	35/2$^-$	5785.2	33/2$^-$	M1	1.37×10^{-3}	DCO=0.59 *12*

$^{99}_{45}Rh_{54}$-9

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
								α(K)=0.001206 *17*; α(L)=0.0001384 *20*; α(M)=2.56×10^{-5} *4* α(N)=4.27×10^{-6} *6*; α(O)=2.21×10^{-7} *4*
891.6 *3*	36.5 *24*	2593.2	21/2$^+$	1701.7	17/2$^+$	E2	1.23×10^{-3}	DCO=0.94 *7* α(K)=0.001076 *15*; α(L)=0.0001267 *18*; α(M)=2.35×10^{-5} *4* α(N)=3.89×10^{-6} *6*; α(O)=1.93×10^{-7} *3*
891.7 *3*	25.2 *18*	8018.6	41/2$^-$	7126.9	37/2$^-$	E2	1.23×10^{-3}	IPDCO=+0.06 *2*. DCO=0.95 *7* α(K)=0.001076 *15*; α(L)=0.0001267 *18*; α(M)=2.35×10^{-5} *4* α(N)=3.88×10^{-6} *6*; α(O)=1.93×10^{-7} *3*
906.5 *10*	1.38 *17*	6878.9	35/2$^+$	5972.6	31/2$^+$	E2	1.18×10^{-3}	IPDCO=+0.01 *1*. α(K)=0.001035 *15*; α(L)=0.0001217 *18*; α(M)=2.26×10^{-5} *4* α(N)=3.73×10^{-6} *6*; α(O)=1.85×10^{-7} *3*
915.1 *10*	0.25 *4*	979.1	9/2$^-$	63.9	9/2$^+$	E1	4.79×10^{-4}	α(K)=0.000421 *6*; α(L)=4.76×10^{-5} *7*; α(M)=8.81×10^{-6} *13* α(N)=1.462×10^{-6} *21*; α(O)=7.49×10^{-8} *11*
918.0 *10*	0.42 *7*	2619.8	17/2$^-$	1701.7	17/2$^+$	E1	4.76×10^{-4}	α(K)=0.000418 *6*; α(L)=4.74×10^{-5} *7*; α(M)=8.75×10^{-6} *13* α(N)=1.453×10^{-6} *21*; α(O)=7.44×10^{-8} *11*
919.4 *10*	1.76 *20*	13397.9	(53/2,55/2)$^-$	12478.5	(49/2,51/2)$^-$	E2	1.14×10^{-3}	DCO=0.89 *14* α(K)=0.001002 *15*; α(L)=0.0001177 *17*; α(M)=2.18×10^{-5} *4* α(N)=3.61×10^{-6} *6*; α(O)=1.79×10^{-7} *3*
919.8 *10*	0.45 *8*	12542.1	(51/2$^-$)	11622.2	47/2$^-$	(E2)	1.14×10^{-3}	α(K)=0.001001 *15*; α(L)=0.0001175 *17*; α(M)=2.18×10^{-5} *4* α(N)=3.61×10^{-6} *6*; α(O)=1.79×10^{-7} *3*
927.7 *10*	0.14 *3*	3547.4	21/2$^-$	2619.8	17/2$^-$	E2	1.12×10^{-3}	α(K)=0.000981 *14*; α(L)=0.0001152 *17*; α(M)=2.13×10^{-5} *3* α(N)=3.53×10^{-6} *5*; α(O)=1.757×10^{-7} *25*
928.4 *3*	15.0 *8*	4916.9	29/2$^-$	3988.8	25/2$^-$	E2	1.12×10^{-3}	DCO=0.89 *8* α(K)=0.000979 *14*; α(L)=0.0001150 *17*; α(M)=2.13×10^{-5} *3* α(N)=3.53×10^{-6} *5*; α(O)=1.754×10^{-7} *25* IPDCO=+0.01.
947.4 *10*	0.45 *8*	4825.3	29/2$^+$	3878.2	25/2$^+$	E2	1.07×10^{-3}	α(K)=0.000935 *14*; α(L)=0.0001095 *16*; α(M)=2.03×10^{-5} *3* α(N)=3.36×10^{-6} *5*; α(O)=1.675×10^{-7} *24*
954.8 *3*	19.0 *12*	3149.9	23/2$^+$	2194.9	19/2$^+$	E2	1.05×10^{-3}	DCO=1.01 *8* α(K)=0.000918 *13*; α(L)=0.0001075 *15*; α(M)=1.99×10^{-5} *3* α(N)=3.30×10^{-6} *5*; α(O)=1.645×10^{-7} *23* IPDCO=+0.02 *1*.
960.0 *10*	0.18 *3*	2619.8	17/2$^-$	1660.1	15/2$^+$	E2	1.04×10^{-3}	DCO=0.8 *3* α(K)=0.000907 *13*; α(L)=0.0001062 *15*; α(M)=1.97×10^{-5} *3* α(N)=3.26×10^{-6} *5*; α(O)=1.625×10^{-7} *23*
967.0 *10*	0.51 *8*	16308.9	(61/2,63/2)$^-$	15341.9	(57/2,59/2)$^-$	(E2)	1.02×10^{-3}	α(K)=0.000892 *13*; α(L)=0.0001044 *15*; α(M)=1.93×10^{-5} *3* α(N)=3.20×10^{-6} *5*; α(O)=1.598×10^{-7} *23*
973.9 *10*	0.58 *9*	8868.4	43/2$^-$	7894.5	39/2$^-$	E2	1.00×10^{-3}	α(K)=0.000877 *13*; α(L)=0.0001026 *15*; α(M)=1.90×10^{-5} *3* α(N)=3.15×10^{-6} *5*; α(O)=1.573×10^{-7} *23*
980.0 *10*	0.40 *7*	4678.0	27/2$^+$	3698.1	23/2$^+$	E2	9.88×10^{-4}	α(K)=0.000865 *13*; α(L)=0.0001011 *15*; α(M)=1.87×10^{-5} *3* α(N)=3.10×10^{-6} *5*; α(O)=1.551×10^{-7} *22*

$^{99}_{45}Rh_{54}$-10

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[#]	Comments
985.2 *10*	0.57 *10*	4098.5	25/2$^-$	3113.2	21/2$^-$	E2	9.76×10^{-4}	α(K)=0.000855 *13*; α(L)=9.99×10^{-5} *15*; α(M)=1.85×10^{-5} *3* α(N)=3.07×10^{-6} *5*; α(O)=1.532×10^{-7} *22* IPDCO=+0.04 *1*.
987.8 *10*	1.95 *22*	3878.2	25/2$^+$	2890.2	21/2$^+$	E2	9.70×10^{-4}	α(K)=0.000850 *12*; α(L)=9.93×10^{-5} *14*; α(M)=1.84×10^{-5} *3* α(N)=3.05×10^{-6} *5*; α(O)=1.523×10^{-7} *22*
992.0 *10*	0.75 *10*	4579.6	27/2$^-$	3586.5	25/2$^+$	E1	4.10×10^{-4}	α(K)=0.000360 *5*; α(L)=4.07×10^{-5} *6*; α(M)=7.52×10^{-6} *11* α(N)=1.249×10^{-6} *18*; α(O)=6.41×10^{-8} *9*
992.7 *10*	0.45 *8*	7871.6	(35/2$^+$)	6878.9	35/2$^+$			
993.4 *3*	11.6 *7*	3586.5	25/2$^+$	2593.2	21/2$^+$	E2	9.58×10^{-4}	DCO=1.02 *8* α(K)=0.000839 *12*; α(L)=9.80×10^{-5} *14*; α(M)=1.82×10^{-5} *3* α(N)=3.01×10^{-6} *5*; α(O)=1.504×10^{-7} *21* IPDCO=+0.04 *1*.
1000.4 *10*	1.30 *16*	5826.3	31/2$^+$	4825.3	29/2$^+$	M1	1.04×10^{-3}	α(K)=0.000910 *13*; α(L)=0.0001041 *15*; α(M)=1.93×10^{-5} *3* α(N)=3.21×10^{-6} *5*; α(O)=1.665×10^{-7} *24*
1010.9 *10*	0.87 *12*	5972.6	31/2$^+$	4961.3	27/2$^+$	E2	9.21×10^{-4}	α(K)=0.000806 *12*; α(L)=9.41×10^{-5} *14*; α(M)=1.744×10^{-5} *25* α(N)=2.89×10^{-6} *4*; α(O)=1.447×10^{-7} *21*
1041.4 *5*	9.9 *6*	4628.0	29/2$^+$	3586.5	25/2$^+$	E2	8.62×10^{-4}	DCO=0.71 *5* α(K)=0.000755 *11*; α(L)=8.79×10^{-5} *13*; α(M)=1.628×10^{-5} *23* α(N)=2.70×10^{-6} *4*; α(O)=1.354×10^{-7} *19* IPDCO=+0.08 *3*.
1043.8 *10*	0.32 *6*	10380.1	(41/2)	9336.3	(39/2)	(M1)	9.45×10^{-4}	α(K)=0.000830 *12*; α(L)=9.48×10^{-5} *14*; α(M)=1.755×10^{-5} *25* α(N)=2.92×10^{-6} *5*; α(O)=1.517×10^{-7} *22*
1047.5 *10*	0.35 *6*	5145.9	29/2$^-$	4098.5	25/2$^-$	E2	8.51×10^{-4}	DCO=1.03 *20* α(K)=0.000745 *11*; α(L)=8.67×10^{-5} *13*; α(M)=1.607×10^{-5} *23* α(N)=2.66×10^{-6} *4*; α(O)=1.337×10^{-7} *19*
1052.5 *5*	8.1 *6*	6878.9	35/2$^+$	5826.3	31/2$^+$	E2	8.42×10^{-4}	DCO=0.84 *14* α(K)=0.000737 *11*; α(L)=8.58×10^{-5} *12*; α(M)=1.589×10^{-5} *23* α(N)=2.63×10^{-6} *4*; α(O)=1.323×10^{-7} *19* IPDCO=+0.05 *1*.
1055.6 *5*	5.9 *5*	5319.9	31/2$^+$	4264.0	27/2$^+$	E2	8.36×10^{-4}	DCO=1.07 *10* α(K)=0.000732 *11*; α(L)=8.52×10^{-5} *12*; α(M)=1.579×10^{-5} *23* α(N)=2.62×10^{-6} *4*; α(O)=1.314×10^{-7} *19* IPDCO=+0.010 *4*.
1065.9 *10*	0.47 *8*	5693.9	(33/2$^+$)	4628.0	29/2$^+$	E2	8.18×10^{-4}	DCO=1.20 *20* α(K)=0.000717 *11*; α(L)=8.33×10^{-5} *12*; α(M)=1.544×10^{-5} *22* α(N)=2.56×10^{-6} *4*; α(O)=1.287×10^{-7} *19*
1073.5 *5*	4.7 *4*	5701.2	33/2$^+$	4628.0	29/2$^+$	E2	8.06×10^{-4}	DCO=1.20 *15* α(K)=0.000706 *10*; α(L)=8.20×10^{-5} *12*; α(M)=1.520×10^{-5} *22* α(N)=2.52×10^{-6} *4*; α(O)=1.267×10^{-7} *18* IPDCO=+0.04 *1*.
1081.4 *10*	0.78 *12*	11054.4	(45/2,47/2)$^-$	9973.1	(43/2$^-$)			

$^{99}_{45}Rh_{54}$-11

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[#]	Comments
1089.2 *10*	1.02 *14*	9957.6	45/2$^-$	8868.4	43/2$^-$	M1	8.62×10^{-4}	α(K)=0.000757 *11*; α(L)=8.63×10^{-5} *13*; α(M)=1.599×10^{-5} *23* α(N)=2.66×10^{-6} *4*; α(O)=1.382×10^{-7} *20*
1091.0 *10*	0.57 *9*	4678.0	27/2$^+$	3586.5	25/2$^+$	M1	8.59×10^{-4}	α(K)=0.000754 *11*; α(L)=8.60×10^{-5} *13*; α(M)=1.593×10^{-5} *23* α(N)=2.65×10^{-6} *4*; α(O)=1.377×10^{-7} *20*
1099.4 *10*	1.70 *20*	4249.5	27/2$^+$	3149.9	23/2$^+$	E2	7.65×10^{-4}	DCO=0.82 *12* α(K)=0.000670 *10*; α(L)=7.77×10^{-5} *11*; α(M)=1.440×10^{-5} *21* α(N)=2.39×10^{-6} *4*; α(O)=1.203×10^{-7} *17*
1104.0 *10*	1.61 *18*	4690.2	29/2$^+$	3586.5	25/2$^+$	E2	7.58×10^{-4}	α(K)=0.000664 *10*; α(L)=7.70×10^{-5} *11*; α(M)=1.427×10^{-5} *21* α(N)=2.36×10^{-6} *4*; α(O)=1.192×10^{-7} *17*; α(IPF)=6.38×10^{-7} *24*
1104.3 *10*	1.20 *15*	3698.1	23/2$^+$	2593.2	21/2$^+$	M1	8.37×10^{-4}	α(K)=0.000734 *11*; α(L)=8.38×10^{-5} *12*; α(M)=1.552×10^{-5} *22* α(N)=2.58×10^{-6} *4*; α(O)=1.342×10^{-7} *19*; α(IPF)=5.21×10^{-7} *20*
1114.1 *3*	10.2 *6*	4264.0	27/2$^+$	3149.9	23/2$^+$	E2	7.44×10^{-4}	DCO=1.02 *8* α(K)=0.000651 *10*; α(L)=7.55×10^{-5} *11*; α(M)=1.398×10^{-5} *20* α(N)=2.32×10^{-6} *4*; α(O)=1.169×10^{-7} *17*; α(IPF)=8.92×10^{-7} *16*
1117.5 *3*	33.8 *20*	3710.6	23/2$^-$	2593.2	21/2$^+$	E1	3.35×10^{-4}	DCO=0.47 *4* α(K)=0.000288 *4*; α(L)=3.25×10^{-5} *5*; α(M)=6.00×10^{-6} *9* α(N)=9.97×10^{-7} *14*; α(O)=5.13×10^{-8} *8*; α(IPF)=7.42×10^{-6} *12* IPDCO=+0.02 *1*.
1127.9 *5*	2.45 *28*	6829.1	37/2$^+$	5701.2	33/2$^+$	E2	7.24×10^{-4}	DCO=0.89 *14* α(K)=0.000634 *9*; α(L)=7.34×10^{-5} *11*; α(M)=1.360×10^{-5} *19* α(N)=2.25×10^{-6} *4*; α(O)=1.138×10^{-7} *16*; α(IPF)=1.37×10^{-6} *3* IPDCO=+0.08 *3*.
1148.0 *5*	3.09 *34*	5826.3	31/2$^+$	4678.0	27/2$^+$	E2	6.98×10^{-4}	α(K)=0.000610 *9*; α(L)=7.06×10^{-5} *10*; α(M)=1.308×10^{-5} *19* α(N)=2.17×10^{-6} *3*; α(O)=1.096×10^{-7} *16*; α(IPF)=2.39×10^{-6} *5*
1148.0 *10*	0.24 *5*	5972.6	31/2$^+$	4825.3	29/2$^+$	M1	7.71×10^{-4}	α(K)=0.000676 *10*; α(L)=7.70×10^{-5} *11*; α(M)=1.426×10^{-5} *21* α(N)=2.37×10^{-6} *4*; α(O)=1.234×10^{-7} *18*; α(IPF)=1.95×10^{-6} *6*
1154.1 *10*	0.17 *3*	6299.9	33/2$^-$	5145.9	29/2$^-$	E2	6.91×10^{-4}	α(K)=0.000603 *9*; α(L)=6.98×10^{-5} *10*; α(M)=1.293×10^{-5} *19* α(N)=2.14×10^{-6} *3*; α(O)=1.083×10^{-7} *16*; α(IPF)=2.79×10^{-6} *8*
1162[&]	<0.01	7461.9		6299.9	33/2$^-$			
1188.4 *5*	2.45 *28*	2890.2	21/2$^+$	1701.7	17/2$^+$	E2	6.52×10^{-4}	α(K)=0.000567 *8*; α(L)=6.54×10^{-5} *10*; α(M)=1.212×10^{-5} *17* α(N)=2.01×10^{-6} *3*; α(O)=1.018×10^{-7} *15*; α(IPF)=5.98×10^{-6} *11*
1198.4 *5*	2.10 *25*	5826.3	31/2$^+$	4628.0	29/2$^+$	M1	7.08×10^{-4}	α(K)=0.000616 *9*; α(L)=7.02×10^{-5} *10*; α(M)=1.300×10^{-5} *19* α(N)=2.16×10^{-6} *3*; α(O)=1.125×10^{-7} *16*; α(IPF)=5.94×10^{-6} *10*
1205.6 *5*	5.5 *5*	8084.5	(37/2$^+$)	6878.9	35/2$^+$	D		DCO=0.52 *6*
1215.0 *10*	0.10 *2*	4328.4	(25/2$^-$)	3113.2	21/2$^-$	(E2)	6.26×10^{-4}	α(K)=0.000541 *8*; α(L)=6.24×10^{-5} *9*; α(M)=1.155×10^{-5} *17* α(N)=1.92×10^{-6} *3*; α(O)=9.72×10^{-8} *14*; α(IPF)=9.51×10^{-6} *20*
1218.0 *10*	0.35 *6*	6665.7	35/2$^-$	5447.5	31/2$^-$	E2	6.23×10^{-4}	α(K)=0.000538 *8*; α(L)=6.20×10^{-5} *9*; α(M)=1.149×10^{-5} *17* α(N)=1.91×10^{-6} *3*; α(O)=9.67×10^{-8} *14*; α(IPF)=9.96×10^{-6} *21*
1228.9 *10*	0.93 *17*	7894.5	39/2$^-$	6665.7	35/2$^-$	E2	6.14×10^{-4}	α(K)=0.000528 *8*; α(L)=6.09×10^{-5} *9*; α(M)=1.127×10^{-5} *16* α(N)=1.87×10^{-6} *3*; α(O)=9.49×10^{-8} *14*; α(IPF)=1.166×10^{-5} *23*
1238.9 *10*	0.90 *17*	4825.3	29/2$^+$	3586.5	25/2$^+$	E2	6.05×10^{-4}	DCO=0.75 *18*

$^{99}_{45}Rh_{54}$-12

(HI,xnγ) 2014Ku20 (continued)

γ(^{99}Rh) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
								α(K)=0.000519 *8*; α(L)=5.98×10^{-5} *9*; α(M)=1.108×10^{-5} *16* α(N)=1.84×10^{-6} *3*; α(O)=9.33×10^{-8} *14*; α(IPF)=1.33×10^{-5} *3*
1251.8 *5*	3.8 *4*	9336.3	(39/2)	8084.5	(37/2$^+$)	D		DCO=0.60 *9*
1253.0 *10*	0.27 *5*	15175.4		13922.4				
1256.0 *10*	0.25 *5*	9587.1		8331.1				
1282.3 *10*	0.08 *2*	5972.6	31/2$^+$	4690.2	29/2$^+$	M1	6.26×10^{-4}	α(K)=0.000534 *8*; α(L)=6.07×10^{-5} *9*; α(M)=1.124×10^{-5} *16* α(N)=1.87×10^{-6} *3*; α(O)=9.74×10^{-8} *14*; α(IPF)=1.79×10^{-5} *3*
1305.8 *5*	4.9 *4*	10174.2	45/2$^-$	8868.4	43/2$^-$	M1	6.07×10^{-4}	DCO=0.54 *6* α(K)=0.000514 *8*; α(L)=5.84×10^{-5} *9*; α(M)=1.081×10^{-5} *16* α(N)=1.80×10^{-6} *3*; α(O)=9.37×10^{-8} *14*; α(IPF)=2.21×10^{-5} *4*
1341.6 *3*	27.6 *16*	7126.9	37/2$^-$	5785.2	33/2$^-$	E2	5.36×10^{-4}	DCO=0.81 *5* α(K)=0.000440 *7*; α(L)=5.05×10^{-5} *7*; α(M)=9.35×10^{-6} *14* α(N)=1.552×10^{-6} *22*; α(O)=7.92×10^{-8} *11*; α(IPF)=3.45×10^{-5} *5* IPDCO=+0.02 *1*.
1376.0 *10*	0.069 *13*	7675.9	37/2$^-$	6299.9	33/2$^-$	E2	5.20×10^{-4}	α(K)=0.000418 *6*; α(L)=4.79×10^{-5} *7*; α(M)=8.87×10^{-6} *13* α(N)=1.473×10^{-6} *21*; α(O)=7.52×10^{-8} *11*; α(IPF)=4.33×10^{-5} *7*
1401.8 *10*	0.47 *8*	10738.1		9336.3	(39/2)			
1424.1 *10*	0.31 *5*	12414.0	(47/2)	10989.9	(43/2)	(E2)	5.02×10^{-4}	α(K)=0.000390 *6*; α(L)=4.46×10^{-5} *7*; α(M)=8.26×10^{-6} *12* α(N)=1.372×10^{-6} *20*; α(O)=7.02×10^{-8} *10*; α(IPF)=5.71×10^{-5} *9*
1424.1 *5*	2.31 *24*	12478.5	(49/2,51/2)$^-$	11054.4	(45/2,47/2)$^-$	E2	5.02×10^{-4}	DCO=0.75 *12* α(K)=0.000390 *6*; α(L)=4.46×10^{-5} *7*; α(M)=8.26×10^{-6} *12* α(N)=1.372×10^{-6} *20*; α(O)=7.02×10^{-8} *10*; α(IPF)=5.71×10^{-5} *9* IPDCO=+0.04 *1*.
1427 *1*	0.09 *2*	13729.1		12302.1				
1436.0 *5*	2.86 *34*	11610.2		10174.2	45/2$^-$			
1440.0 *10*	0.16 *3*	12178.1		10738.1				
1448.0 *5*	3.8 *3*	11622.2	47/2$^-$	10174.2	45/2$^-$	M1	5.27×10^{-4}	DCO=0.62 *8* α(K)=0.000414 *6*; α(L)=4.70×10^{-5} *7*; α(M)=8.70×10^{-6} *13* α(N)=1.448×10^{-6} *21*; α(O)=7.55×10^{-8} *11*; α(IPF)=5.58×10^{-5} *8*
1464.0 *10*	1.08 *14*	9482.6	43/2$^-$	8018.6	41/2$^-$			
1489.0 *10*	1.24 *14*	5366.9	29/2$^+$	3878.2	25/2$^+$	E2	4.85×10^{-4}	α(K)=0.000357 *5*; α(L)=4.08×10^{-5} *6*; α(M)=7.55×10^{-6} *11* α(N)=1.254×10^{-6} *18*; α(O)=6.42×10^{-8} *9*; α(IPF)=7.86×10^{-5} *12*
1490.1 *10*	0.51 *7*	8319.2	41/2$^+$	6829.1	37/2$^+$	E2	4.85×10^{-4}	DCO=0.89 *18* α(K)=0.000357 *5*; α(L)=4.07×10^{-5} *6*; α(M)=7.54×10^{-6} *11* α(N)=1.252×10^{-6} *18*; α(O)=6.41×10^{-8} *9*; α(IPF)=7.90×10^{-5} *12*
1502.0 *10*	0.25 *5*	8331.1		6829.1	37/2$^+$			
1503.4 *10*	0.32 *6*	3698.1	23/2$^+$	2194.9	19/2$^+$	E2	4.83×10^{-4}	α(K)=0.000350 *5*; α(L)=4.00×10^{-5} *6*; α(M)=7.40×10^{-6} *11* α(N)=1.229×10^{-6} *18*; α(O)=6.30×10^{-8} *9*; α(IPF)=8.38×10^{-5} *13*
1507.0 *10*	0.25 *5*	14904.9		13397.9	(53/2,55/2)$^-$			
1564.0 *10*	0.37 *7*	12302.1		10738.1				
1588.0[@] *10*	0.45[@] *9*	7282.0		5693.9	(33/2$^+$)			
1588.0[@] *10*	0.55[@] *10*	12577.9		10989.9	(43/2)			

$^{99}_{45}Rh_{54}$-13

(HI,xnγ) 2014Ku20 (continued)

$\gamma(^{99}Rh)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
1601.3 *10*	0.41 *8*	7302.5	$37/2^+$	5701.2	$33/2^+$	E2	4.75×10^{-4}	α(K)=0.000310 *5*; α(L)=3.53×10^{-5} *5*; α(M)=6.52×10^{-6} *10* α(N)=1.084×10^{-6} *16*; α(O)=5.57×10^{-8} *8*; α(IPF)=0.0001222 *18*
1608.5 *10*	0.38 *8*	7302.5	$37/2^+$	5693.9	$(33/2^+)$	(E2)	4.75×10^{-4}	α(K)=0.000307 *5*; α(L)=3.50×10^{-5} *5*; α(M)=6.47×10^{-6} *9* α(N)=1.075×10^{-6} *16*; α(O)=5.52×10^{-8} *8*; α(IPF)=0.0001252 *18*
1616.0 *10*	0.84 *13*	15013.9	$(57/2,59/2)^-$	13397.9	$(53/2,55/2)^-$	E2	4.75×10^{-4}	DCO=1.04 *20* α(K)=0.000304 *5*; α(L)=3.46×10^{-5} *5*; α(M)=6.41×10^{-6} *9* α(N)=1.065×10^{-6} *15*; α(O)=5.47×10^{-8} *8*; α(IPF)=0.0001284 *19*
1619.0 *10*	0.14 *3*	8448.1		6829.1	$37/2^+$			
1653.6 *10*	0.58 *9*	10989.9	(43/2)	9336.3	(39/2)	E2	4.76×10^{-4}	DCO=1.20 *20* α(K)=0.000291 *4*; α(L)=3.31×10^{-5} *5*; α(M)=6.12×10^{-6} *9* α(N)=1.018×10^{-6} *15*; α(O)=5.24×10^{-8} *8*; α(IPF)=0.0001443 *21*
1721 *1*	0.046 *11*	16625.9		14904.9				
1724 *1*	0.028 *7*	8024.0		6299.9	$33/2^-$			
1730 *1*	0.090 *21*	16743.9		15013.9	$(57/2,59/2)^-$			
1748 *1*	0.75 *13*	9766.6		8018.6	$41/2^-$			
1811.3 *10*	0.81 *14*	4961.3	$27/2^+$	3149.9	$23/2^+$	E2	4.93×10^{-4}	α(K)=0.000245 *4*; α(L)=2.77×10^{-5} *4*; α(M)=5.13×10^{-6} *8* α(N)=8.53×10^{-7} *12*; α(O)=4.41×10^{-8} *7*; α(IPF)=0.000214 *3*
1906.4 *10*	0.20 *3*	10225.7	$(45/2^+)$	8319.2	$41/2^+$	(E2)	5.12×10^{-4}	α(K)=0.000223 *4*; α(L)=2.52×10^{-5} *4*; α(M)=4.66×10^{-6} *7* α(N)=7.74×10^{-7} *11*; α(O)=4.00×10^{-8} *6*; α(IPF)=0.000259 *4*
1931.3 *10*	0.35 *7*	5517.8	$29/2^+$	3586.5	$25/2^+$	E2	5.18×10^{-4}	α(K)=0.000217 *3*; α(L)=2.46×10^{-5} *4*; α(M)=4.54×10^{-6} *7* α(N)=7.56×10^{-7} *11*; α(O)=3.91×10^{-8} *6*; α(IPF)=0.000271 *4*
1939.0 *10*	0.62 *11*	9957.6	$45/2^-$	8018.6	$41/2^-$	E2	5.20×10^{-4}	α(K)=0.000216 *3*; α(L)=2.44×10^{-5} *4*; α(M)=4.51×10^{-6} *7* α(N)=7.50×10^{-7} *11*; α(O)=3.88×10^{-8} *6*; α(IPF)=0.000274 *4*
1944 *1*	0.57 *12*	15341.9	$(57/2,59/2)^-$	13397.9	$(53/2,55/2)^-$	(E2)	5.21×10^{-4}	α(K)=0.000215 *3*; α(L)=2.43×10^{-5} *4*; α(M)=4.49×10^{-6} *7* α(N)=7.47×10^{-7} *11*; α(O)=3.86×10^{-8} *6*; α(IPF)=0.000277 *4*
1946.0 *10*	0.091 *27*	16959.9	$(61/2,63/2)^-$	15013.9	$(57/2,59/2)^-$	(E2)	5.21×10^{-4}	α(K)=0.000214 *3*; α(L)=2.42×10^{-5} *4*; α(M)=4.48×10^{-6} *7* α(N)=7.45×10^{-7} *11*; α(O)=3.85×10^{-8} *6*; α(IPF)=0.000278 *4*
1954.6 *10*	0.63 *11*	9973.1	$(43/2^-)$	8018.6	$41/2^-$	(M1)	5.15×10^{-4}	α(K)=0.000226 *4*; α(L)=2.55×10^{-5} *4*; α(M)=4.72×10^{-6} *7* α(N)=7.86×10^{-7} *11*; α(O)=4.11×10^{-8} *6*; α(IPF)=0.000258 *4*
1971.0 *10*	0.042 *9*	16875.9		14904.9				
2186.0 *10*	0.40 *8*	11054.4	$(45/2,47/2)^-$	8868.4	$43/2^-$			
2472.4 *10*	0.40 *9*	15014.5	$(55/2^-)$	12542.1	$(51/2^-)$	(E2)	6.90×10^{-4}	α(K)=0.0001394 *20*; α(L)=1.567×10^{-5} *22*; α(M)=2.90×10^{-6} *4* α(N)=4.82×10^{-7} *7*; α(O)=2.51×10^{-8} *4*; α(IPF)=0.000532 *8*

[†] 2014Ku20 state general uncertainty of 0.3 keV for intense γ rays, which increases to 1 keV for weak and Eγ>1.5 MeV. Evaluators assign 0.3 keV for I$\gamma\geq$10, 0.5 keV for Iγ=2-10, and 1 keV for Iγ<2.

[‡] As given by 2014Ku20 based on DCO ratios and ΔJ^π assignments.

[#] Additional information 1.

[@] Multiply placed with intensity suitably divided.

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

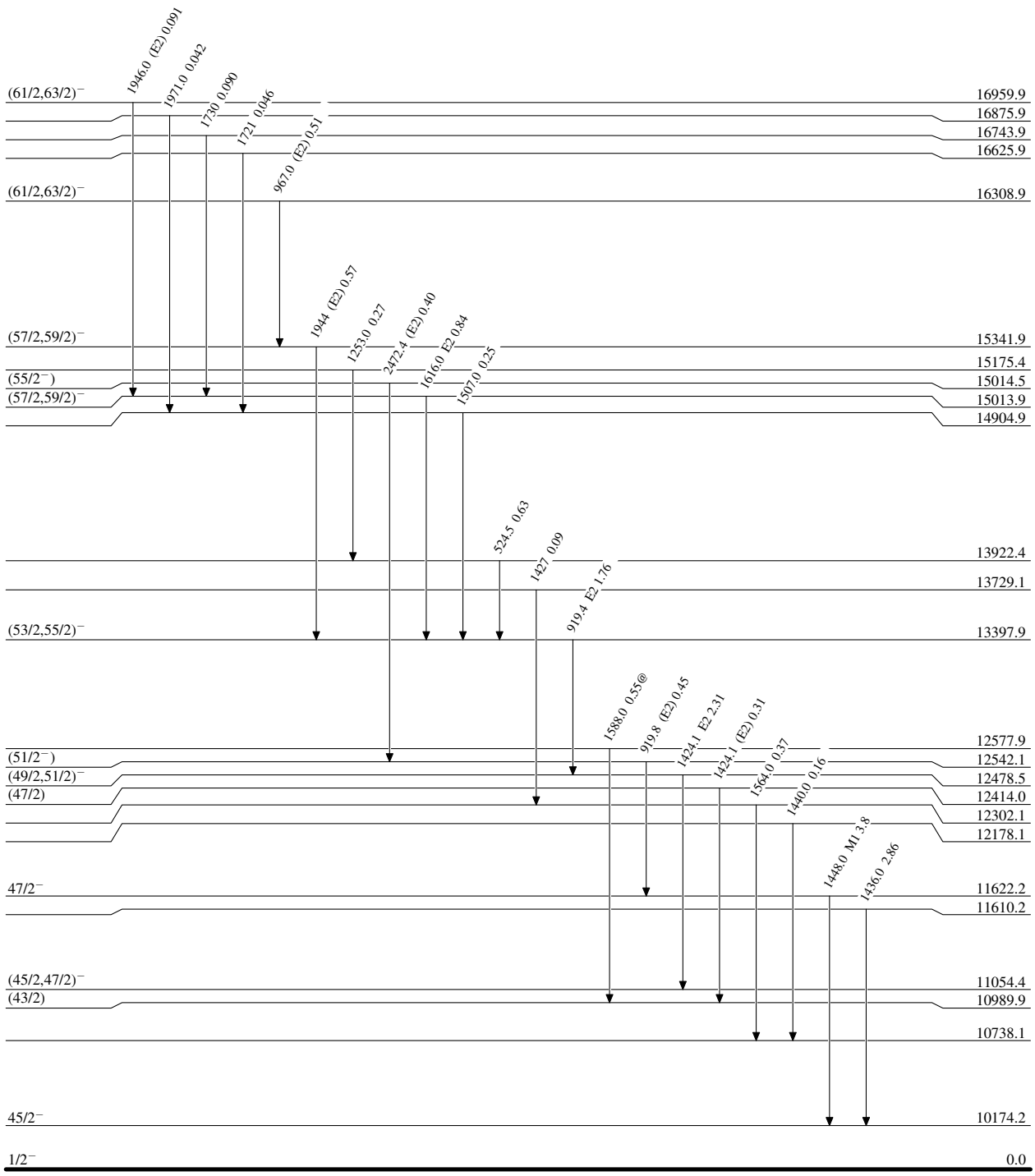
$^{99}_{45}Rh_{54}$-14

(HI,xnγ) 2014Ku20

Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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

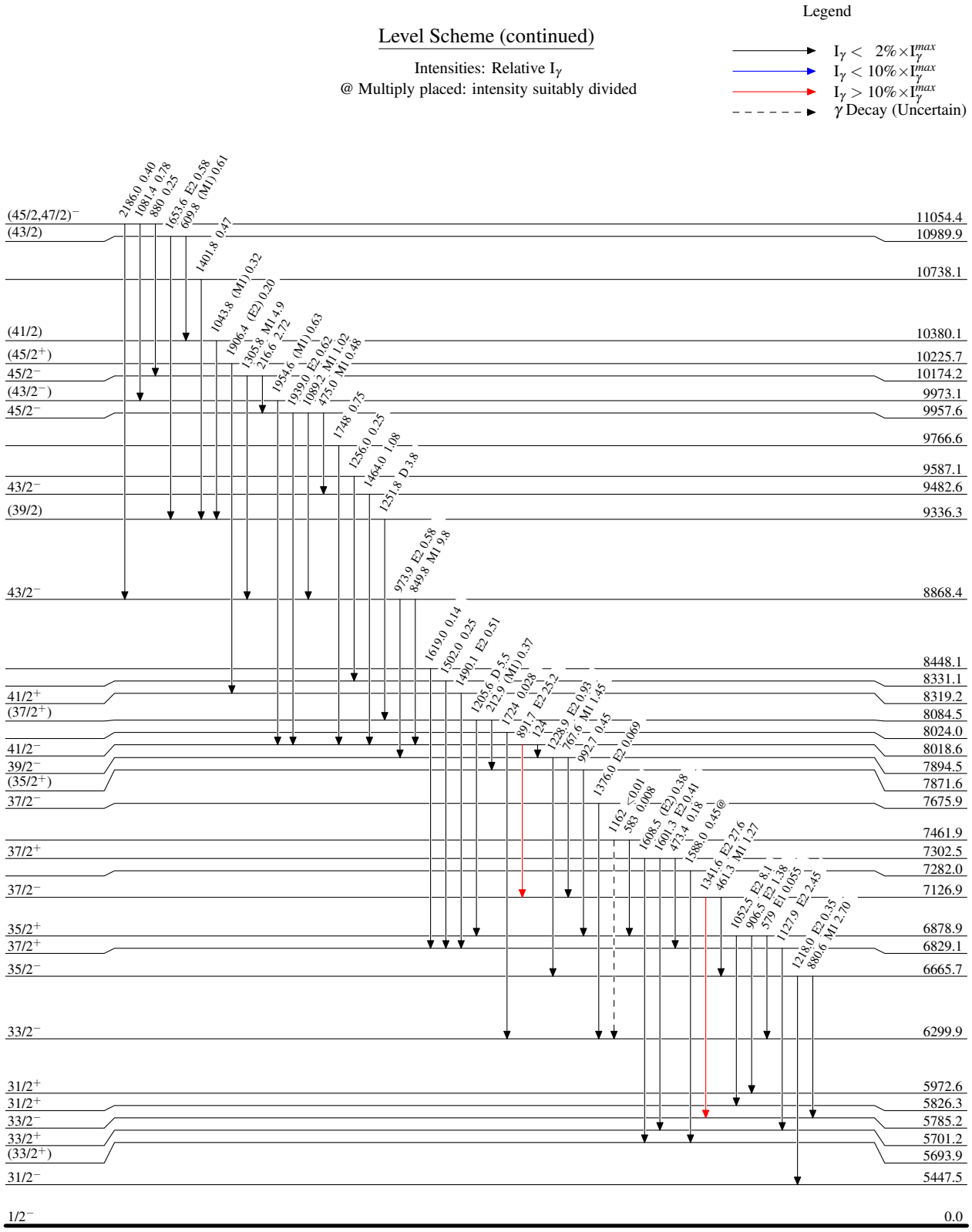


$^{99}_{45}Rh_{54}$

(HI,xnγ) 2014Ku20

Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

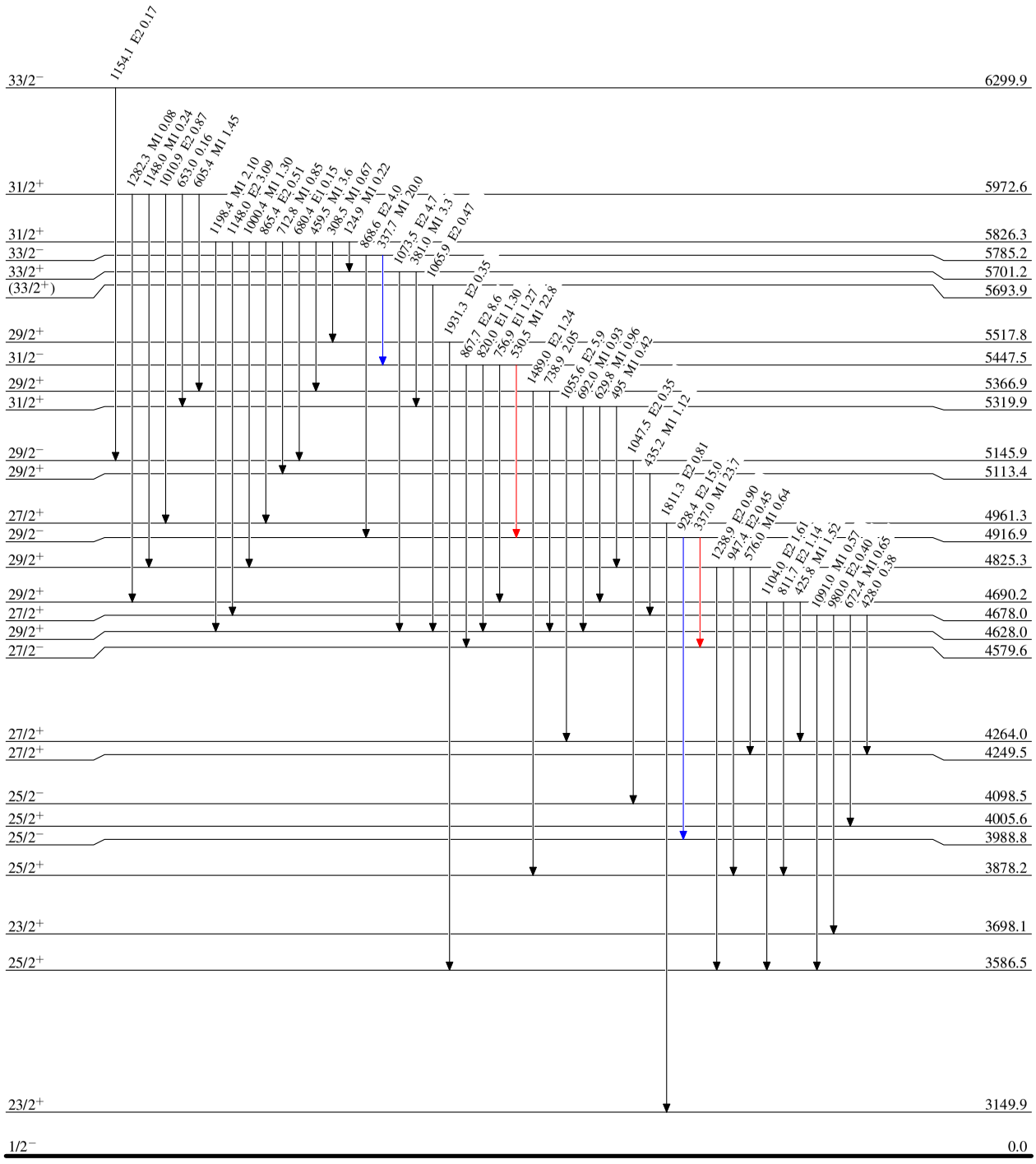


(HI,xnγ) 2014Ku20

Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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



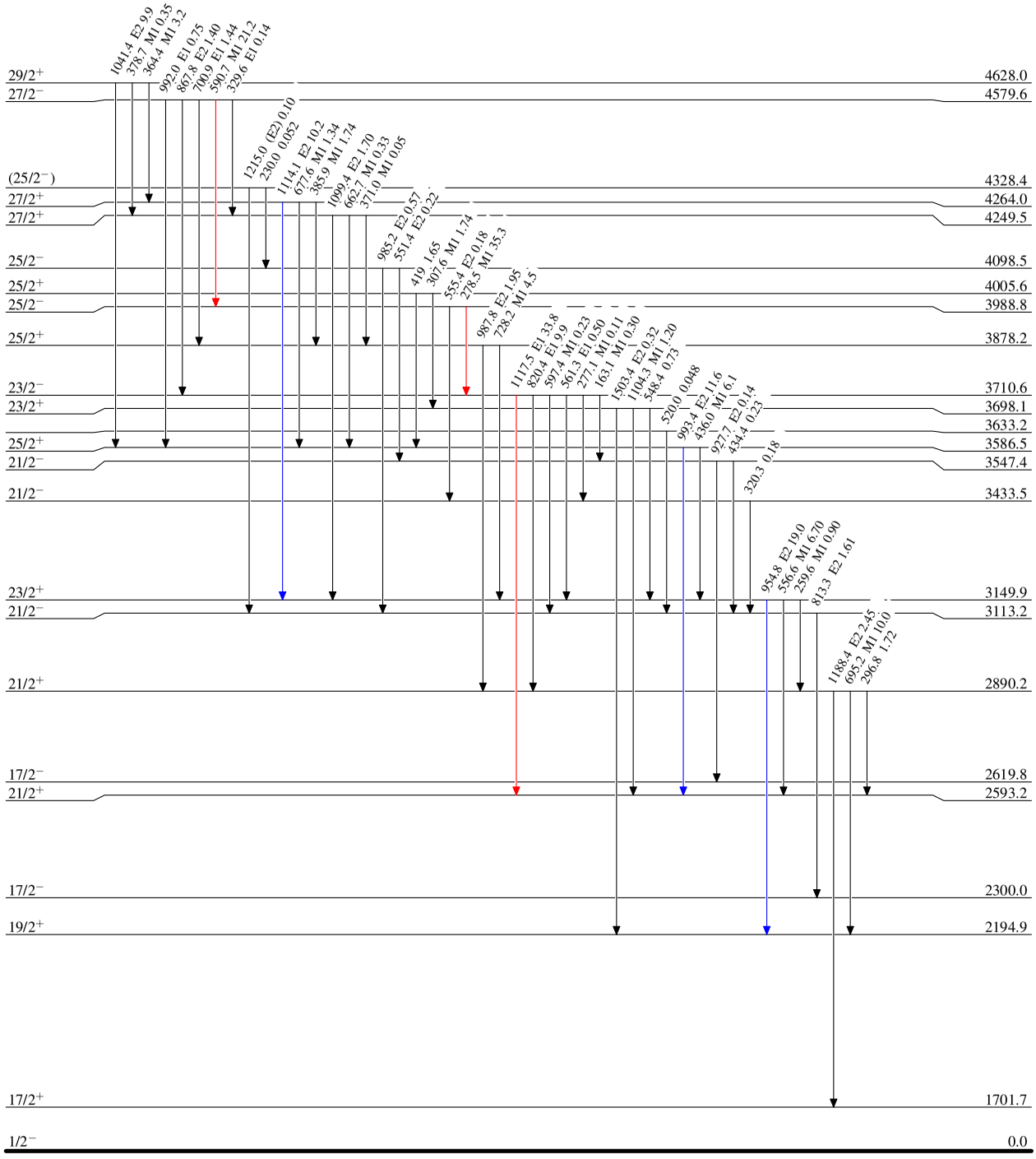
$^{99}_{45}Rh_{54}$

(HI,xnγ) 2014Ku20

Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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

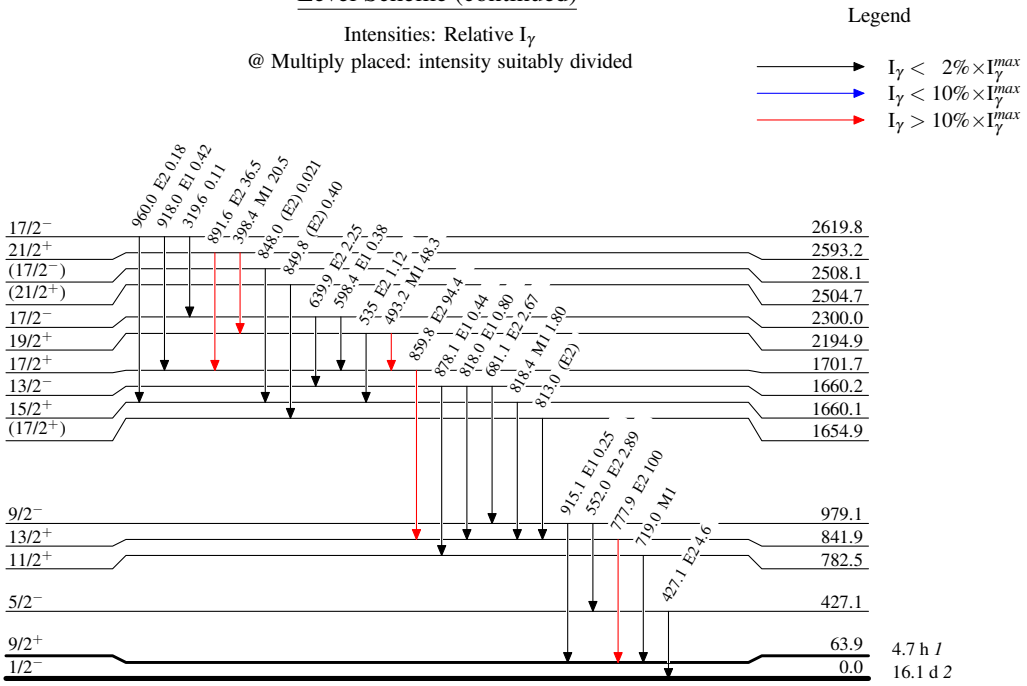


$^{99}_{45}Rh_{54}$

(HI,xnγ) 2014Ku20

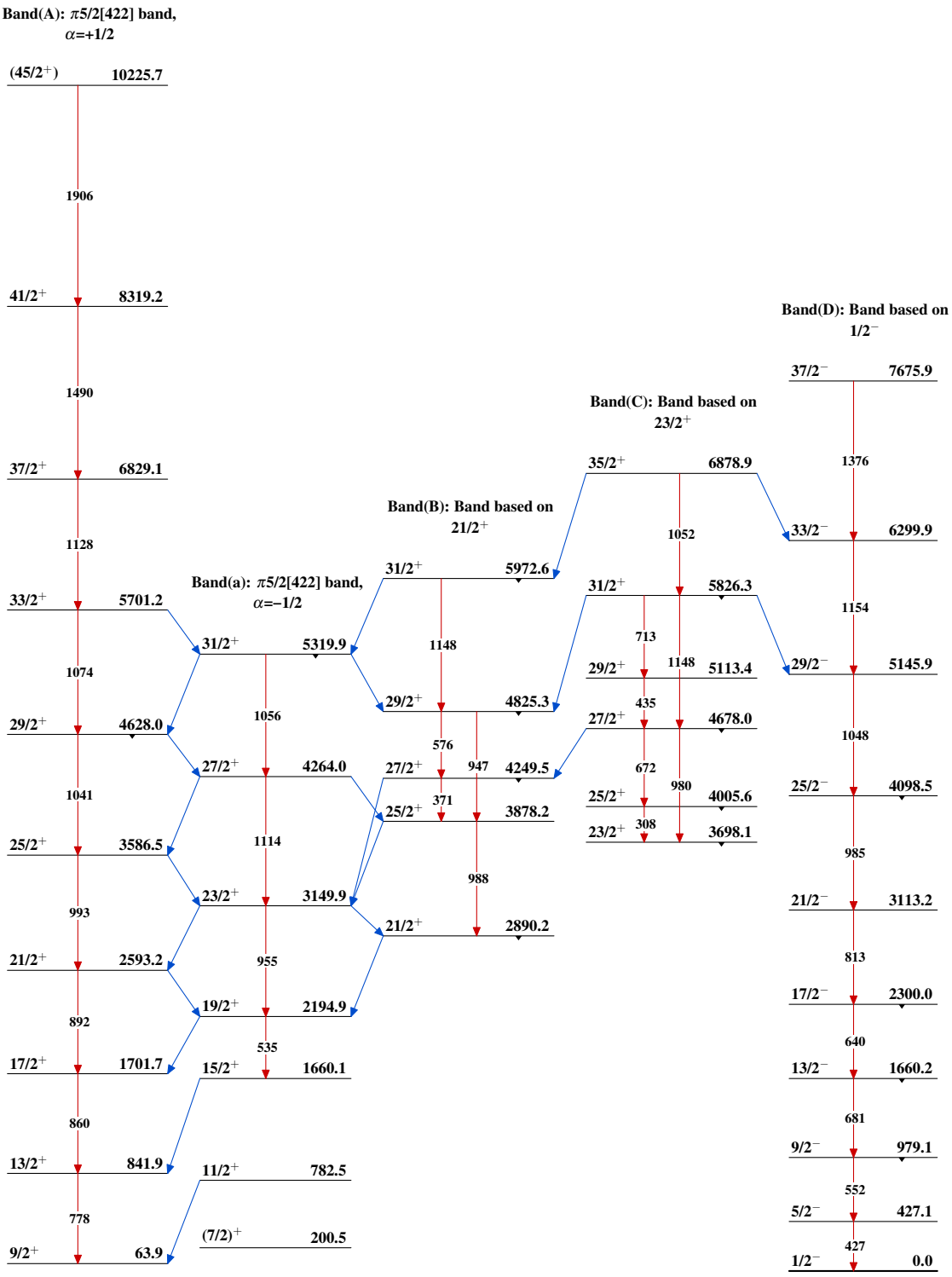
Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided



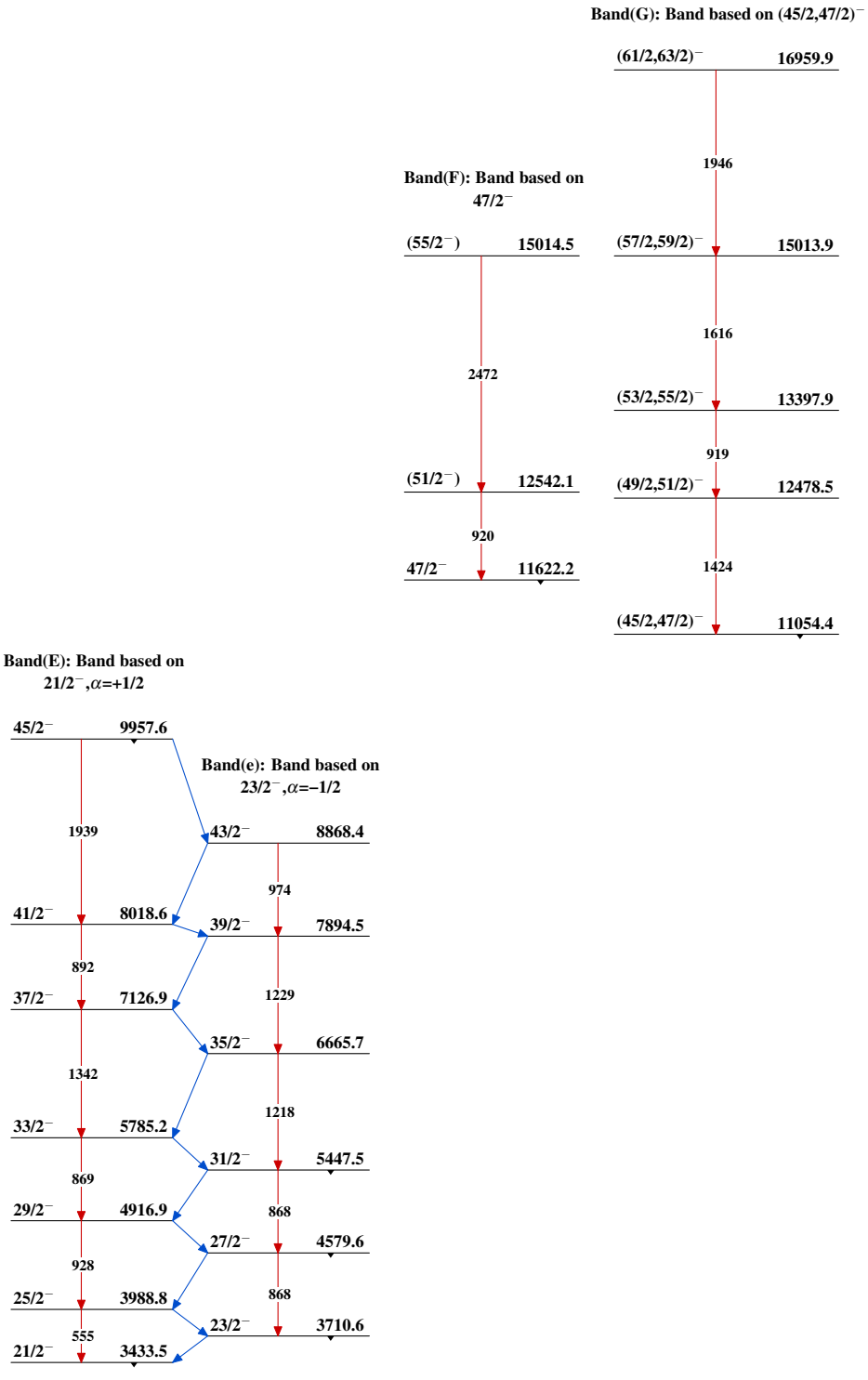
$^{99}_{45}Rh_{54}$

(HI,xnγ) 2014Ku20



$^{99}_{45}Rh_{54}$

(HI,xnγ) 2014Ku20 (continued)



$^{99}_{45}Rh_{54}$