^{168}Er(^{40}Ar,4nγ) 2002Do19

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. J. Chiara and F. G. Kondev	NDS 111,141 (2010)	1-Oct-2009

E(^{40}Ar)=177 MeV; measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using JUROSPHERE array consisting of different types of Compton-suppressed Ge detectors. The recoiling evaporation residues were separated using the gas-filled recoil separator RITU. Measured prompt and delayed γ rays.

No strongly populated isomers were found with $T_{1/2}$> 0.5 μs.

^{204}Rn Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0#	0^+		
542.90# *10*	2^+		
1131.50# *15*	4^+		
1627.8 *13*	(2,3,4)		
1772.79 *17*	6^+		
1806.20 *17*	6^+		
1911.9 *5*	(4,5)		
2032.72 *19*	8^+		
2105.11 *19*	8^+		
2182.7 *6*	(6,7)		
2218.81 *19*	9^-		Possible Configuration=$((\pi\, f_{5/2})^{+1}(\pi\, i_{13/2})^{+1})_{9-}$.
2239.2 *3*	(7)		
2248.13 *24*	8^+		
2365.5 *5*	(8,9)		
2371.2 *4*	(8,9)		
2452.8 *3*	10^+		
2461.9 *4*	10^-	34 ns *4*	$T_{1/2}$: From 243γ(t). Possible Configuration=$((\pi\, f_{7/2})^{+1}(\pi\, i_{13/2})^{+1})_{10-}$.
2540.0 *7*	(8^+)		
2597.2 *4*	11^-		Possible Configuration=$((\pi\, h_{9/2})^{+1}(\pi\, i_{13/2})^{+1})_{11-}$.
2636.61 *21*	10^+		
2681.1 *3*	10^+		
2688.1 *3*	10^+		
2794.3 *7*	9^+		J$^\pi$: π=+ from mult(761.6).
2894.9 *4*	(10^+)		
2933.11 *21*	(10^+)		
3035.3 *3*	12^+	14 ns *4*	$T_{1/2}$: From 234γ(t), 438γ(t), and 583γ(t), but the lifetime assignment to this level is not definite – the authors argue for presence of a low- energy transition (unobserved) that feeds this level.
3151.0 *4*	(12^+)		
3165.5 *4*	(11^-)		
3193.0 *4*	11		
3228.5 *4*	(11,12)		
3246.4 *12*	(10^+)		
3305.8 *4*	13^-		
3398.7 *11*	(11,12)		
3410.5 *4*	(12^+)		
3473.6 *5*	(11,12)		
3507.1 *4*	13^-		J$^\pi$: π=– from mult(471.8).
3677.2 *4*	12^+		
3736.5 *5*	(12,13,14)		
3782.3 *6*	(12,13,14)		
3895.0 *5*	(13,14,15)		
3949.0 *4*	14^+		

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^{168}Er(^{40}Ar,4nγ) 2002Do19 (continued)

^{204}Rn Levels (continued)

E(level)†	Jπ‡	Comments
3980.2 *13*	(12,13,14)	
4001.9 *5*	14^+	Jπ: π=+ from mult(494.8).
4087.4 *5*	(14,15,16)	
4120.7 *8*	(13,14)	
4413.9 *7*	(14 to 17)	
4583.2 *10*	(14 to 17)	

† From a least-squares fit to Eγ.
‡ From 2002Do19, unless otherwise specified.
# Band(A): g.s. band.

γ(^{204}Rn)

Eγ†	Iγ†	Ei(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
113.7 *1*	3.8 *2*	2218.81	9^-	2105.11	8^+	E1	DCO=0.81 *7* Mult.: α(exp) is consistent with E1 assignment.
135.2 *2*	11.1 *4*	2597.2	11^-	2461.9	10^-	M1	DCO=0.9 *2* DCO is for gate on ΔJ=1, dipole transition. Mult.: The intensity balance is consistent with M1 assignment.
138.4 *3*	0.9 *1*	4087.4	(14,15,16)	3949.0	14^+		
140.3 *4*	1.3 *1*	3305.8	13^-	3165.5	(11^-)		
186.1 *1*	4.7 *2*	2218.81	9^-	2032.72	8^+	E1	DCO=0.88 *6* Mult.: α(exp) is consistent with E1 assignment.
215.3 *2*	1.1 *2*	2248.13	8^+	2032.72	8^+	M1	DCO=1.1 *2* Mult.: ΔJ=0 transition.
234.0 *2*	2.2 *1*	2452.8	10^+	2218.81	9^-	E1	DCO=0.78 *10* Mult.: The intensity balance is consistent with E1 assignment.
242.8 *4*	0.87 *9*	2461.9	10^-	2218.81	9^-	M1	DCO=0.8 *2*
259.9 *1*	23 *1*	2032.72	8^+	1772.79	6^+	E2	DCO=0.97 *4*
262.9 *8*	0.33 *6*	3736.5	(12,13,14)	3473.6	(11,12)		
266.1 *3*	1.4 *1*	2371.2	(8,9)	2105.11	8^+		
271.8 *2*	2.8 *2*	3949.0	14^+	3677.2	12^+	E2	DCO=1.0 *3*
298.9 *1*	30 *1*	2105.11	8^+	1806.20	6^+	E2	DCO=0.95 *4*
327.0 *5*	1.0 *1*	2239.2	(7)	1911.9	(4,5)		
332.8 *4*	1.0 *1*	2365.5	(8,9)	2032.72	8^+		
371.8 *4*	1.0 *9*	3782.3	(12,13,14)	3410.5	(12^+)		
376.5 *5*	1.3 *2*	2182.7	(6,7)	1806.20	6^+		
433.2 *4*	2.4 *2*	2239.2	(7)	1806.20	6^+		
438.0 *4*	3.3 *3*	3035.3	12^+	2597.2	11^-	E1	DCO=1.0 *2* DCO is for gate on ΔJ=1, dipole transition.
465.6 *10*	0.4 *1*	3398.7	(11,12)	2933.11	(10^+)		
466.4 *4*	2.5 *2*	2239.2	(7)	1772.79	6^+		
469.9 *2*	3.8 *2*	3151.0	(12^+)	2681.1	10^+	(E2)	DCO=1.0 *2*
471.8 *2*	4.8 *3*	3507.1	13^-	3035.3	12^+	E1	DCO=1.0 *1* DCO is for gate on ΔJ=1, dipole transition.
475.6 *3*	3.1 *2*	2248.13	8^+	1772.79	6^+	E2	DCO=0.9 *2* Mult.: α(exp) is consistent with E2 assignment.
494.8 *2*	2.9 *2*	4001.9	14^+	3507.1	13^-	E1	DCO=0.9 *1* DCO is for gate on ΔJ=1, dipole transition.

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^{168}Er(^{40}Ar,4nγ) 2002Do19 (continued)

$\gamma(^{204}Rn)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
504.9 *3*	3.0 *2*	3193.0	11	2688.1	10^+	D	DCO=0.6 *1* Mult.: ΔJ=1 transition.
508.0 *4*	1.3 *1*	3736.5	(12,13,14)	3228.5	(11,12)		
511.6 *3*	2.7 *2*	3677.2	12^+	3165.5	(11^-)	E1	DCO=0.7 *1*
518.9 *5*	2.2 *2*	4413.9	(14 to 17)	3895.0	(13,14,15)		
542.9 *1*	100	542.90	2^+	0	0^+	E2	DCO=0.99 *2*
568.3 *3*	14 *1*	3165.5	(11^-)	2597.2	11^-	(M1)	DCO=0.8 *1* DCO is for gate on ΔJ=1, dipole transition.
576.0 *2*	3.2 *2*	2681.1	10^+	2105.11	8^+	E2	DCO=1.1 *2*
578.7 *3*	2.1 *2*	3473.6	(11,12)	2894.9	(10^+)		
582.6 *2*	5.6 *3*	3035.3	12^+	2452.8	10^+	E2	DCO=1.3 *2*
583.0 *2*	11.7 *5*	2688.1	10^+	2105.11	8^+	E2	DCO=1.2 *1*
588.6 *1*	99 *4*	1131.50	4^+	542.90	2^+	E2	DCO=1.04 *4*
589.2 *3*	10.5 *7*	3895.0	(13,14,15)	3305.8	13^-		
591.9 *3*	4.1 *2*	3228.5	(11,12)	2636.61	10^+		
603.9 *1*	15.5 *8*	2636.61	10^+	2032.72	8^+	E2	DCO=1.03 *5*
641.3 *1*	45 *2*	1772.79	6^+	1131.50	4^+	E2	DCO=0.98 *4*
646.8 *3*	3.8 *2*	2894.9	(10^+)	2248.13	8^+	(E2)	DCO=0.8 *2*
674.7 *1*	42 *2*	1806.20	6^+	1131.50	4^+	E2	DCO=0.99 *3*
688.2 *8*	1.3 *2*	4583.2	(14 to 17)	3895.0	(13,14,15)		
706.4 *10*	0.6 *1*	3246.4	(10^+)	2540.0	(8^+)		
708.6 *2*	18.2 *1*	3305.8	13^-	2597.2	11^-	E2	DCO=1.6 *2* DCO is for gate on ΔJ=1, dipole transition.
710.2 *7*	0.9 *1*	4120.7	(13,14)	3410.5	(12^+)		
722.4 *2*	5.1 *3*	3410.5	(12^+)	2688.1	10^+	(E2)	DCO=1.7 *3*
751.7 *12*	0.5 *1*	3980.2	(12,13,14)	3228.5	(11,12)		
761.6 *6*	1.3 *2*	2794.3	9^+	2032.72	8^+	M1	DCO=0.8 *1*
767.2 *6*	1.8 *2*	2540.0	(8^+)	1772.79	6^+		
779.9 *6*	1.8 *4*	1911.9	(4,5)	1131.50	4^+		
828.0 *1*	0.7 *1*	2933.11	(10^+)	2105.11	8^+		
1040.6 *3*	2.7 *2*	3677.2	12^+	2636.61	10^+	E2	DCO=1.0 *2*
1084.9 *13*	1.8 *4*	1627.8	(2,3,4)	542.90	2^+		

[†] From 2002Do19.
[‡] From 2002Do19 based on DCO ratios corresponding to gates on stretched quadrupole transitions, unless otherwise stated, and α(exp) from intensity balance considerations (values were not given in 2002Do19).

^{168}Er(^{40}Ar,4nγ) 2002Do19

Level Scheme

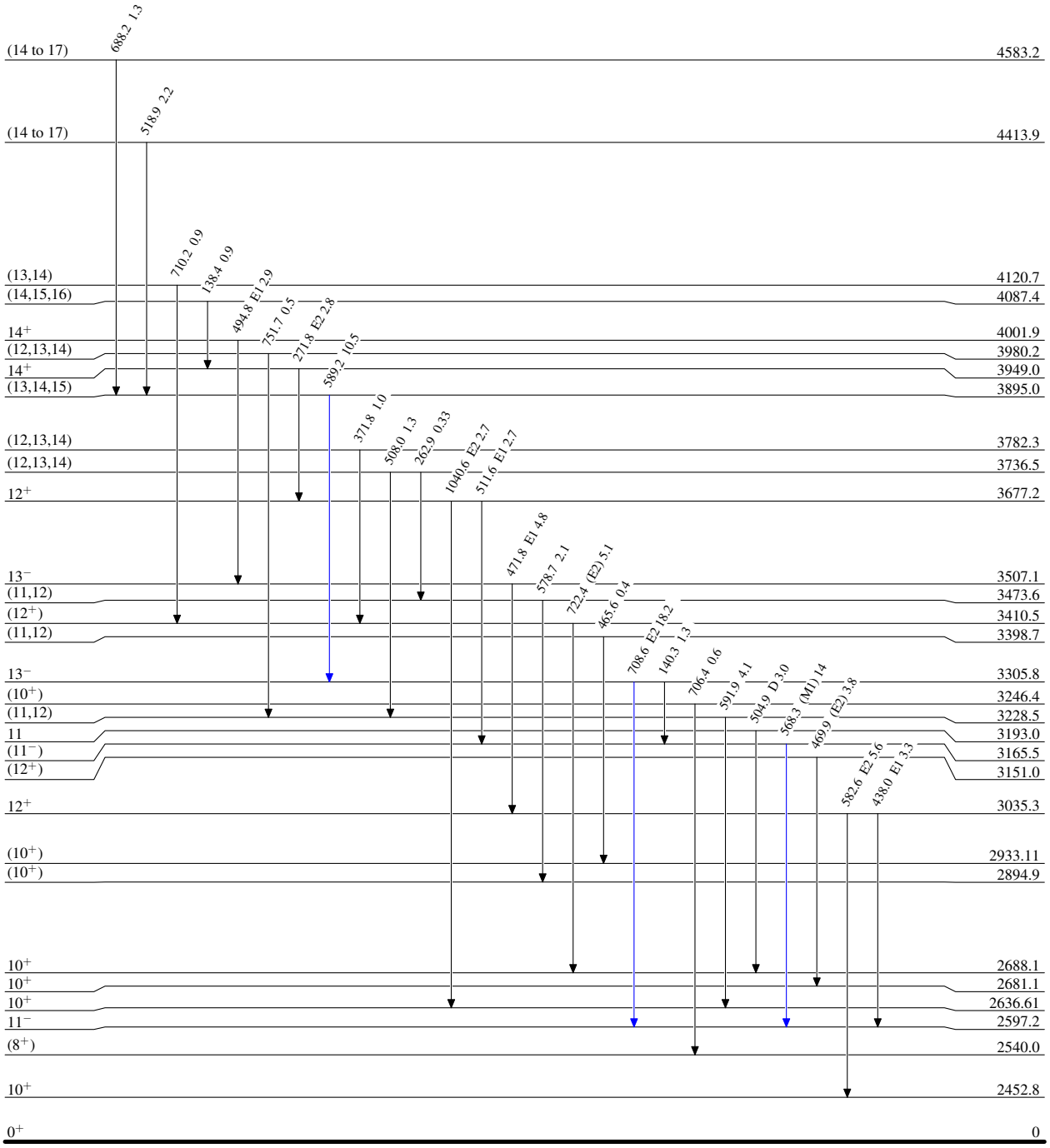
Intensities: Relative I_γ

Legend

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

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

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

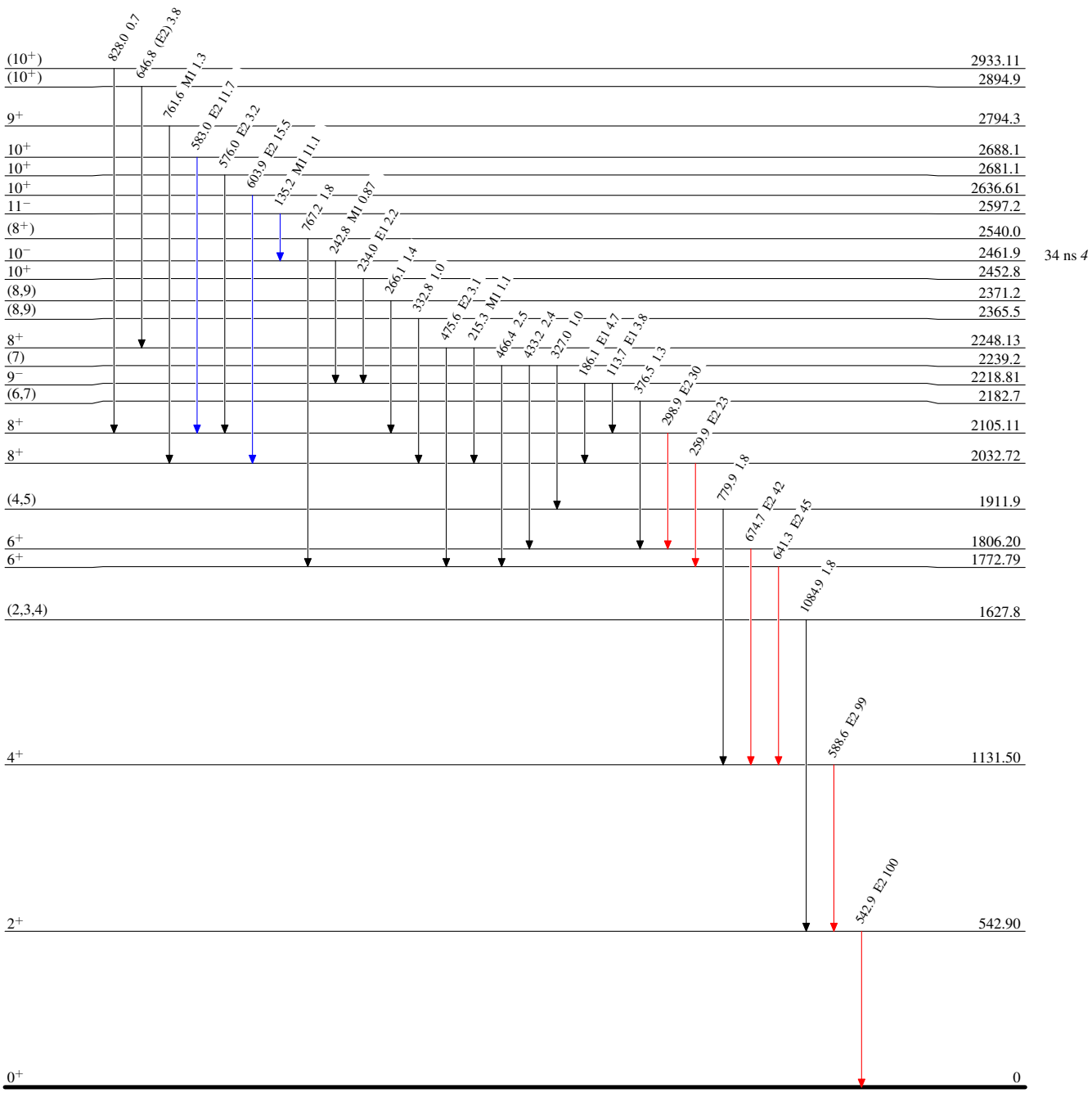


$^{204}_{86}Rn_{118}$

^{168}Er(^{40}Ar,4nγ) 2002Do19

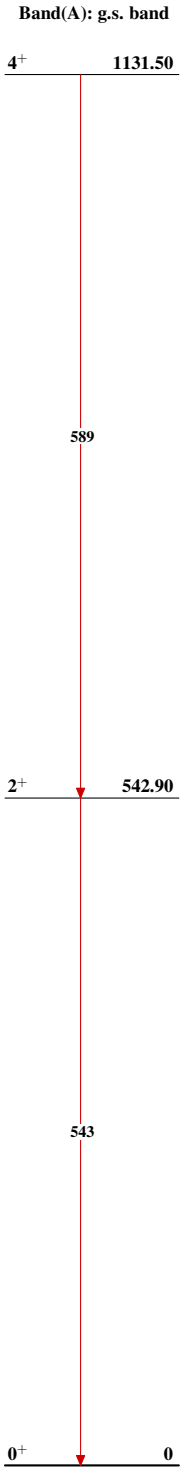
Level Scheme (continued)

Intensities: Relative I_γ



$^{204}_{86}Rn_{118}$

^{168}Er(^{40}Ar,4nγ) 2002Do19



$^{204}_{86}Rn_{118}$