Coulomb excitation 1993Wo05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Y. A. Akovali	NDS 77,433 (1996)	1-Feb-1996

Earlier Coulomb excitation work: 1980Zi04.
(^{4}He,^{4}He′): the inelastically scattered ^{4}He particles were detected by 1993Wo05 at angles of θ=120° and θ=145°.
(^{16}O,^{16}O′), (^{32}S,^{32}S′): the scattered particles were counted by 1993Wo05 at a range of angles between 112° and 168° with a resolution better than 9° in the scattering angle.
(^{208}Pb,^{208}Pb′): the ^{208}Pb nuclei were detected at scattering-angles between 53° and 90°, and at azimuth angles between 0° and 84°. The γ radiations were detected in coincidence with the scattered ^{208}Pb nuclei.
The particle-$\gamma(\theta)$ results were used in determining/confirming the spin assignments. See 1993Cl04 and 1993Wo05 for E1, E2 and E3 matrix elements calculated from the measured γ yields, and for discussions on the spin dependence of the collective properties of ^{226}Ra.
1993Wo05 calculated charge deformation parameters for ^{226}Ra from the intrinsic multipole moments which were obtained from the B(EL) values. They compared the deduced deformation parameters with the theoretical calculations of 1982Le19. See 1993Sr01 for the intrinsic multipole moments obtained from experimental B(EL) values.

^{226}Ra(^{4}He,^{4}He′), E=15-17 MeV (1993Wo05);
^{226}Ra(^{16}O,^{16}O′), E=63 MeV (1993Wo05);
^{226}Ra(^{32}S,^{32}S′), E=135 MeV (1993Wo05);
^{226}Ra(^{208}Pb,^{208}Pb′), E=978 MeV (1993Wo05).

^{226}Ra Levels

E(level)[†]	J$^{\pi}$	Comments
0.0[‡]	0^{+}	
67.67[‡] *1*	2^{+}	B(E2)↑=5.15 *14* (1993Wo05)
211.54[‡] *2*	4^{+}	B(E4)↑=1.08 *15* (1993Wo05)
253.73[#] *1*	1^{-}	
321.54[#] *6*	3^{-}	B(E3)↑=1.10 *11* (1993Wo05)
416.5[‡] *3*	6^{+}	
446.3[#] *2*	5^{-}	
626.7[#] *2*	7^{-}	
650	(0^{+})	
669.4[‡] *3*	8^{+}	
857.6[#] *3*	9^{-}	
959.9[‡] *3*	10^{+}	
1133.1[#] *3*	11^{-}	
1280.5[‡] *4*	12^{+}	
1446[#]	13^{-}	
1625[‡]	14^{+}	
1793[#]	15^{-}	
1993[‡]	16^{+}	
2170[#]	17^{-}	
2382[‡]	18^{+}	

[†] Adopted level energies.
[‡] Band(A): K=0 g.s. band.
[#] Band(B): K=0 octupole-vibrational band.

Coulomb excitation 1993Wo05 (continued)

$\gamma(^{226}Ra)$

E_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
143.8	211.54	4^+	67.67	2^+	[E2]	2.11	
166[‡]	1446	13^-	1280.5	12^+			
168[‡]	1793	15^-	1625	14^+			
173[‡]	1133.1	11^-	959.9	10^+			
177[‡]	2170	17^-	1993	16^+			
179[‡]	1625	14^+	1446	13^-			
180	626.7	7^-	446.3	5^-			
189[‡]	857.6	9^-	669.4	8^+			
200[‡@]	1993	16^+	1793	15^-			
205.1	416.5	6^+	211.54	4^+			
210.4[‡]	626.7	7^-	416.5	6^+			
231	857.6	9^-	626.7	7^-			
235[‡]	446.3	5^-	211.54	4^+			
253	669.4	8^+	416.5	6^+			
274	1133.1	11^-	857.6	9^-			
290	959.9	10^+	669.4	8^+			
313	1446	13^-	1133.1	11^-			
320	1280.5	12^+	959.9	10^+			
345	1625	14^+	1280.5	12^+			
347	1793	15^-	1446	13^-			
368	1993	16^+	1625	14^+			
377	2170	17^-	1793	15^-			
389	2382	18^+	1993	16^+			
396	650	(0^+)	253.73	1^-			E_γ: from R. Zimmermann, Ph.D.thesis, as quoted by 1984Va13.

[†] From 1993Wo05. The observed γ transitions were not listed but are shown in the authors′ decay scheme. According to 1993Wo05, it is a partial scheme. Therefore, the list of transitions given here probably does not represent the complete observed spectrum of 1993Wo05. The gammas known from the decay and the reaction works are not added here (see the adopted gammas for the complete list of gammas deexciting each level). The energy resolution was about 3 keV for the high-spin transitions (1993Wo05).

[‡] The interband transitions between the positive and negative parity bands shown in the level scheme of 1993Wo05 are presumably observed transitions. Their energies are deduced from the level energies shown in the authors′ level scheme.

[#] 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.

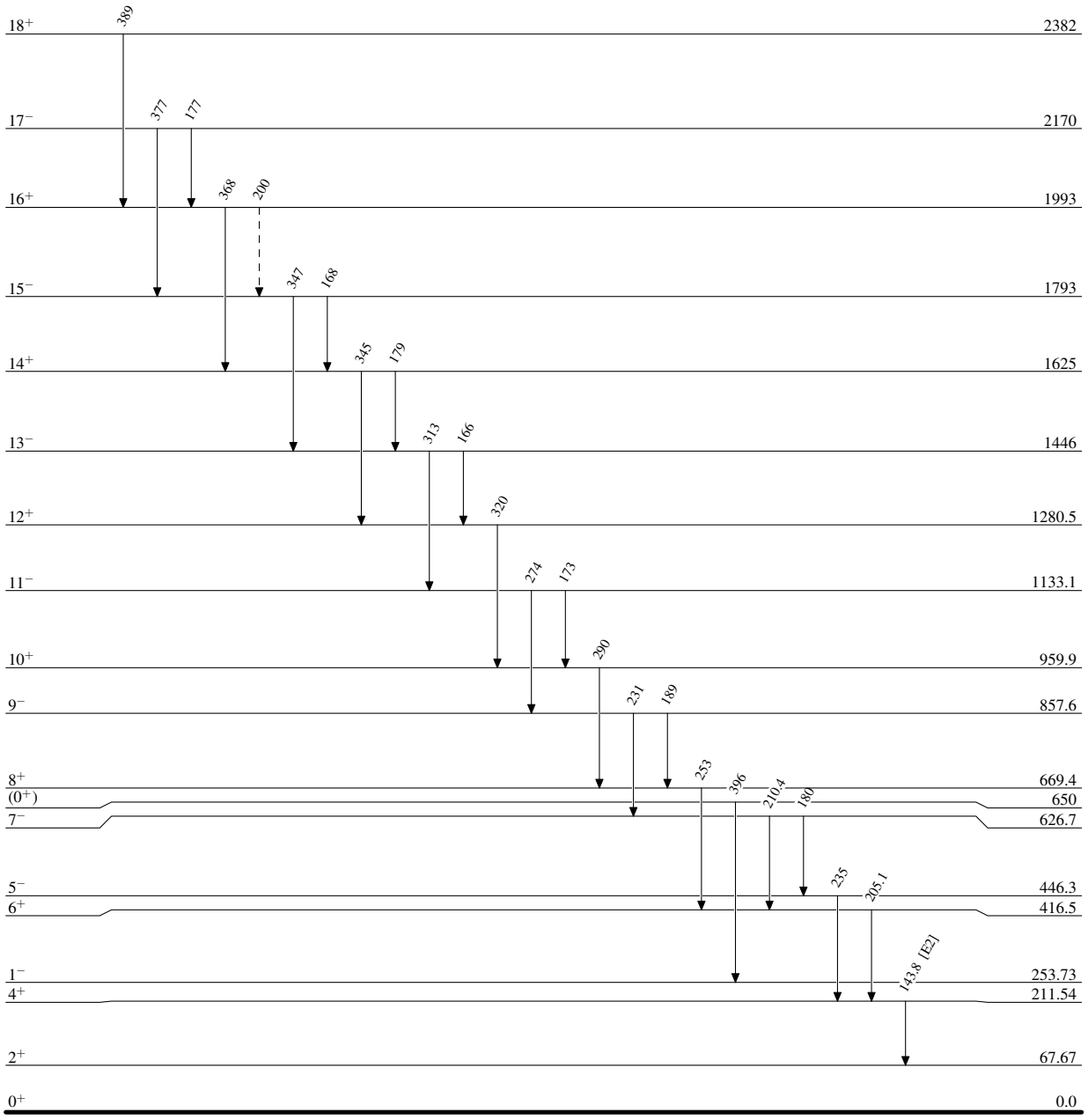
[@] Placement of transition in the level scheme is uncertain.

Legend

Coulomb excitation 1993Wo05

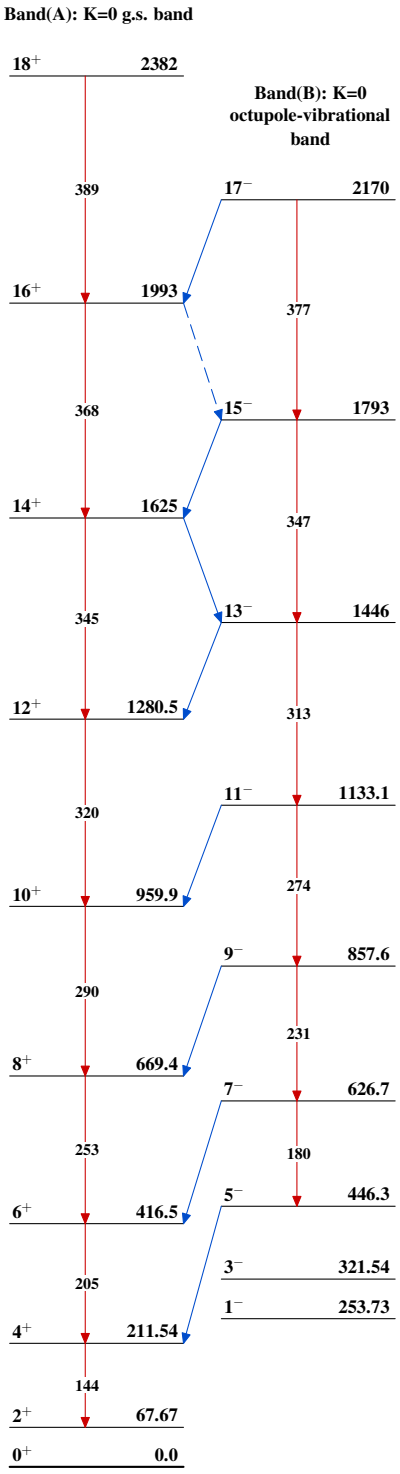
Level Scheme

γ Decay (Uncertain)



$^{226}_{88}Ra_{138}$

Coulomb excitation 1993Wo05



$^{226}_{88}Ra_{138}$