^{96}Ru(α,pnγ) 1983Be63

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

1983Be63 (also 1985Be06): E=30-55 MeV alpha beams were produced from the Buenos Aires Synchrocyclotron. Target was 97% enriched ^{96}Ru. γ rays were detected with two coaxial detectors (FWHM=2.3 and 3 keV). Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$. Deduced levels, J, π. 1983Be63 also report γ data from ^{99}Ru(d,3nγ).

All data are from 1983Be63, unless otherwise noted.

Note that the level scheme here (from 841 level) as proposed in 1983Be63 is based on the assumption of the 841γ proceeding to the $(2)^+$ ground state, while level energies and spins in Adopted Levels are based on the placement of 841γ to a level at E=56 with $J^\pi=(5^+)$ proposed by 2014Ku04 based on a significantly-extended level scheme measured with the ^{75}As(^{28}Si,2p3nγ) reaction, and therefore are higher by 56 keV and 3 units, respectively.

^{98}Rh Levels

E(level)	J$^\pi$	Comments
0.0?	$(2)^+$	The ground state would not be seen if 841γ proceeds to the isomer.
106.8?† *3*	$(3)^+$†	
112.5?† *3*	1^+†	
174.4?† *3*	$(1^+,2^+)$†	
841.3‡ *3*	(4^+)‡	
1567.1‡ *5*	(6^+)‡	
2561.4‡ *6*	(8^+)‡	
3541.3‡ *6*	(10^+)‡	
3805.0 *7*		

† Level suggested (by evaluators) from unplaced γ rays in 1983Be63 compared with ^{98}Pd ε decay results.

‡ From 1983Be63, based on $\gamma(\theta)$ data and the placement of 841γ to $(2)^+$ ground state. Level energies and spins in Adopted Levels are based on the placement of 841γ to a level at E=56 with $J^\pi=(5^+)$ and are higher by 56 keV and 3 units, respectively.

γ(^{98}Rh)

E$_\gamma$†	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.@	Comments
67.7#& *3*		174.4?	$(1^+,2^+)$	106.8?	$(3)^+$		
x89.2							E$_\gamma$: unresolved with 89.7γ in ^{99}Ru (1985Be06).
106.8#& *3*		106.8?	$(3)^+$	0.0?	$(2)^+$		
112.5#& *3*		112.5?	1^+	0.0?	$(2)^+$		
x116.8 *3*							
174.4#& *3*		174.4?	$(1^+,2^+)$	0.0?	$(2)^+$		
x206.4 *3*							
x226.3 *3*							
x234.7 *3*							
263.7 *3*	5 *2*	3805.0		3541.3	(10^+)		
x302.2‡							
x303.7‡							
x343.6 *3*							E$_\gamma$: other: 346.6 from 1985Be06.
x514.4 *3*							
x663.0&							E$_\gamma$: unresolved with 660.6γ in ^{98}Pd (1983Be63,1985Be06).
725.8 *3*	62 *10*	1567.1	(6^+)	841.3	(4^+)	Q	A$_2$=+0.36 *6*; A$_4$=−0.15 *7*

Continued on next page (footnotes at end of table)

^{96}Ru(α,pnγ) 1983Be63 (continued)

$\gamma(^{98}Rh)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
841.3 *3*	100 *10*	841.3	(4^+)	0.0?	$(2)^+$	Q	A_2=+0.30 *4*; A_4=−0.13 *5* 1983Be63 deduced that 841γ mainly proceeds to the g.s. based on their argument that for each 841γ there were 3.0 ε decays of g.s. but only 0.21 decay of ^{98}Rh 3.6-min isomer, from intensity balance of prompt and delayed intensities. However, this argument does not take into account that the isomer decays mostly to the g.s. by %IT=89 reported in 1978Ki17 in ^{98}Pd ε decay. In Adopted Gammas, this γ has been placed to a level at 56 keV with $J^\pi=(5)^+$, proposed by 2014Ku04 in ^{75}As(^{28}Si,2p3nγ) based on a more detailed level scheme.
979.9 *3*	15 *4*	3541.3	(10^+)	2561.4	(8^+)	Q	A_2=+0.38 *10*; A_4=−0.20 *15*
994.3 *3*	30 *8*	2561.4	(8^+)	1567.1	(6^+)	Q	A_2=+0.29 *6*; A_4=−0.12 *10*

[†] Read from Fig.1 of 1983Be63 for Eα=40 MeV, unless otherwise noted. Values from 1985Be06 are read from their spectrum in Fig.1 for Eα=45 MeV and are the same as those in 1983Be63, unless otherwise noted. Placements here are from 1983Be63 assuming 841γ proceeds to the ground state, while a placement of 841γ to a level at 56 keV has been adopted in Adopted Gammas.

[‡] Unresolved 302.2+303.7 doublet (1983Be63,1985Be06).

[#] Placements are suggested by evaluators based on those of γ rays of similar energies in ^{98}Pd ε decay. These γ rays are unplaced by 1983Be63 and their presence in ^{96}Ru(α,pnγ) reaction may be (at least partly) due to ε decay of ^{98}Pd formed through ^{96}Ru(α,2nγ) reaction.

[@] Stretched quadrupole (ΔJ=2, most likely E2) from $\gamma(\theta)$ (1983Be63).

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

[x] γ ray not placed in level scheme.

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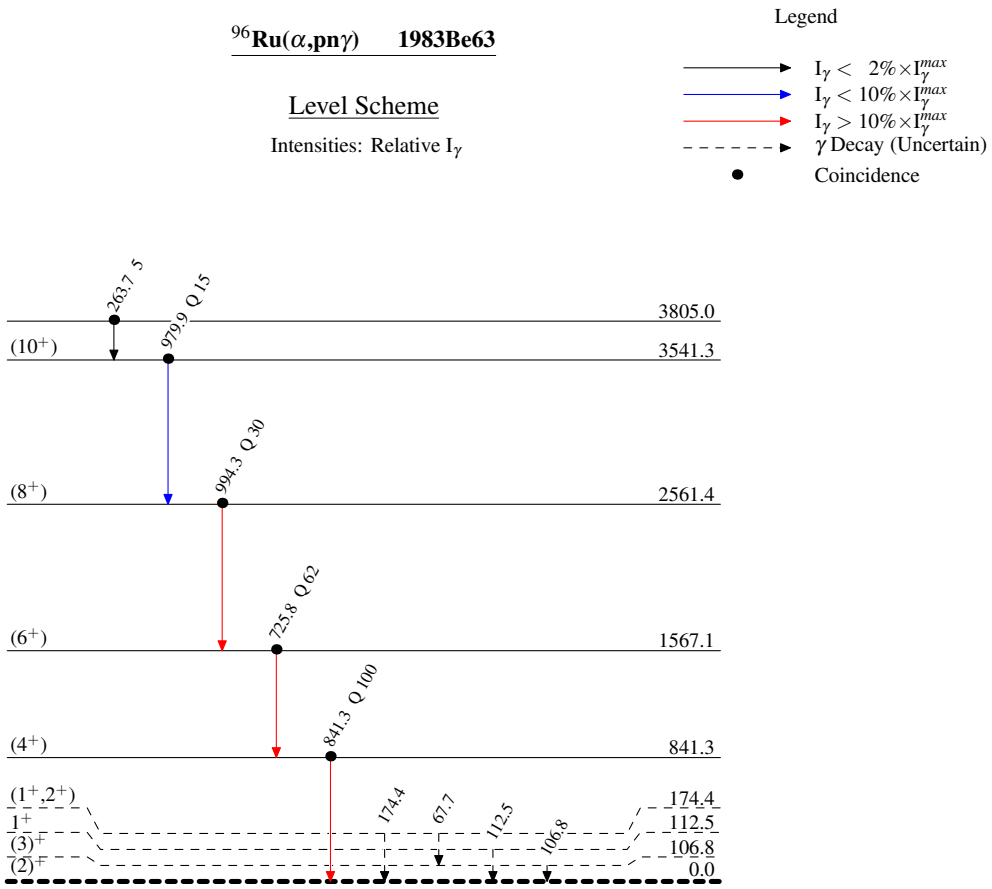
Level Scheme

Intensities: Relative I_γ



$^{98}_{45}Rh_{53}$