^{110}Ru β^- decay 1991Jo11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal and F. G. Kondev	NDS 113, 1315 (2012)	1-Aug-2011

Parent: ^{110}Ru: E=0.0; $J^\pi=0^+$; $T_{1/2}$=12.04 s *17*; Q(β^-)=2774 *20*; %β^- decay=100.0

Source: ^{238}U(p,F), E = 20 MeV. The experiment was performed using MC-20 cyclotron and the IGISOL on-line mass separator facility. The production rate of the parent ^{110}Ru was ≈3×10^2 atoms/μC. The beta decay energies were determined with a ΔE-E telescope detector system consisting of a 300 mm^2, 0.5 mm thick Si(Au) surface barrier ΔE detector and a 60 mm thick and 75 mm in diameter plastic scintillator E detector. The gamma rays were detected by a 20% and a 25% coaxial Ge detectors and a 1.4cm^3 planar Ge detector. The conversion coefficients were measured using magnetic lens type conversion electron spectrometer ELLI. Measured: Eβ^-,Eγ,Iγ,$\gamma\gamma$,$\beta\gamma$, ce, $T_{1/2}$. Deduced: Levels, mult, J^π.

^{110}Rh Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	(1$^+$)	3.35 s *12*	$T_{1/2}$: From Adopted Levels.
112.19 *9*	1$^+$		
166.15 *15*	(1)		
200.4 *5*	(1)		
228.26 *21*	(1)		
251.60 *14*	(1)		
667.1 *3*	(1)		

† From least-square fit to E_γ's.

‡ From 1991Jo11.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*†	Comments
(2107 *20*)	667.1	0.57 *24*	5.95 *19*	av Eβ=839.5 *92*
(2522 *20*)	251.60	0.6 *4*	6.3 *3*	av Eβ=1031.7 *94*
(2546 *20*)	228.26	0.41 *16*	6.43 *17*	av Eβ=1042.5 *94*
(2574 *20*)	200.4	0.21 *10*	6.74 *21*	av Eβ=1055.5 *94*
(2608 *20*)	166.15	0.8 *4*	6.19 *22*	av Eβ=1071.5 *94*
(2662 *20*)	112.19	27 *10*	4.69 *17*	av Eβ=1096.7 *94*
2810 *50*	0.0	70 *10*	4.36 *7*	av Eβ=1149.2 *94*

Iβ^-: Deduced in 1991Jo11 by comparing the total intensities of all ^{110}Rh γ-rays and that of 373.8γ (^{110}Pd) from 30 s beam-off period. The value for the ^{110}Rh g.s. ($J^\pi=1^+$) to ^{110}Pd g.s. ($J^\pi=0^+$) decay branch was not reported in 1991Jo11.

† From intensity balances and the adopted level scheme by the evaluators. Values are tentative, since the level scheme is incomplete (pandemonium).

‡ Absolute intensity per 100 decays.

$\gamma(^{110}Rh)$

Iγ normalization: From Σ Ti(g.s.)=30% *10*, based on 70% *10* ^{110}Ru g.s. ($J^\pi=0^+$) to ^{110}Rh g.s. ($J^\pi=1^+$) β^- feeding (1991Jo11).

Continued on next page (footnotes at end of table)

^{110}Ru β^- decay 1991Jo11 (continued)

$\gamma(^{110}Rh)$ (continued)

E_γ[†]	I_γ[†‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
54.0 *2*	16 *3*	166.15	(1)	112.19	1^+			
85.4 *5*	9 *3*	251.60	(1)	166.15	(1)			
88.2 *5*	9 *3*	200.4	(1)	112.19	1^+			
[x]96.0 *2*	50 *5*							E_γ: Observed in coincidence with Rh K x-rays and β-rays at α=110 but could not be placed in the level scheme.
112.2 *1*	1000 *10*	112.19	1^+	0.0	(1^+)	M1	0.249	α(K)=0.216 *3*; α(L)=0.0264 *4*; α(M)=0.00491 *7*; α(N+..)=0.000853 *13* α(N)=0.000813 *12*; α(O)=4.05×10^{-5} *6* Mult.: From α(K)exp=0.19 *4* (from ce data) and α(K)exp=0.22 *15* (from Ge(γ)-Ge(γ/X) coincidence data) in 1991Jo11.
116.1 *2*	18 *3*	228.26	(1)	112.19	1^+			
139.4 *2*	14 *8*	251.60	(1)	112.19	1^+			
166.1 *2*	26 *8*	166.15	(1)	0.0	(1^+)			
251.6 *2*	21 *7*	251.60	(1)	0.0	(1^+)			
415.4 *3*	17 *5*	667.1	(1)	251.60	(1)			
439.0 *5*		667.1	(1)	228.26	(1)			
554.8 *5*	8 *3*	667.1	(1)	112.19	1^+			

[†] From 1991Jo11.
[‡] For absolute intensity per 100 decays, multiply by 0.023 *8*.
[#] 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.
[x] γ ray not placed in level scheme.

^{110}Ru β^- decay 1991Jo11

Decay Scheme

Intensities: I_γ per 100 parent decays