^{90}Rh ε decay (0.56 s) 2019Pa16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, E. A. Mccutchan	NDS 165, 1 (2020)	1-Mar-2020

Parent: ^{90}Rh: E=0.0+x; J^π=(6,7,8); $T_{1/2}$=0.56 s *2*; Q(ε)=13.2×10^3 *3*; %ε+%$β^+$ decay=100.0

^{90}Rh-Q(ε): value is from systematics from 2017Wa10. In 2019Pa16, the Q value is measured as 13.19 MeV *+150 −116* from endpoint energy measurements.

2019Pa16: ^{90}Rh produced from fragmentation of a ^{124}Xe beam at E=345 MeV/nucleon on a 740 mg/cm^2 ^{9}Be target at RIKEN, Japan. Fragments separated by Bρ-ΔE-Bρ method in the first stages of BigRIPS and then Bρ-TOF-Bρ measurements using later stage of BigRIPS and the ZeroDegree spectrometer. Ions were implanted in WAS3ABi consisting of three double-sided silicon strip detectors and ten single-sided silicon strip detectors. Gamma rays were detected using the Euroball-RIKEN Cluster Array (EURICA) consisting of 84 HPGe crystals arranged in 12 clusters. Measured Eγ, Iγ, β spectra, E(p), I(p), βγ-coin, βp-coin, γβp-coin, half-life, β-delayed proton emission probability.

α: Additional information 1.

^{90}Ru Levels

E(level)†	J^π‡
0.0	0^+
738.10 *10*	2^+
1638.31 *22*	4^+
2524.0 *3*	6^+
2802.2 *3*	(6^+)
2954.9 *3*	(6^+)

† From Eγ.
‡ From the Adopted Levels.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ$^+$ ‡	Iε‡	Log *ft*†	I(ε+$β^+$)‡	Comments
(1.02×10^4 *3*)	2954.9	18 *5*	0.081 *24*	5.09 *14*	18 *5*	av Eβ=4.37×10^3 *15*; εK=0.0039 *4*; εL=0.00047 *5*; εM+=0.000111 *12*
(1.04×10^4 *3*)	2802.2	24 *5*	0.10 *2*	5.00 *12*	24 *5*	av Eβ=4.45×10^3 *15*; εK=0.0037 *4*; εL=0.00045 *5*; εM+=0.000106 *11*
(1.07×10^4 *3*)	2524.0	37 *6*	0.14 *3*	4.87 *10*	37 *6*	av Eβ=4.59×10^3 *15*; εK=0.0034 *4*; εL=0.00041 *4*; εM+=9.7×10^{-5} *10*

† Calculated taking the isomer excitation energy to be zero.
‡ Absolute intensity per 100 decays.

γ(^{90}Ru)

Iγ normalization: From ΣI(γ+ce)(to g.s.)=90.4 % *10*, considering %εp=9.6 % *10* from 2019Pa16 and assuming no feeding to the ground state with ΔJ>5.

E_γ	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	α	Comments
738.1 *1*	100 *12*	738.10	2^+	0.0	0^+	E2	0.00184	α(K)=0.001605 *23*; α(L)=0.000190 *3*; α(M)=3.48×10^{-5} *5*; α(N)=5.60×10^{-6} *8*; α(O)=2.84×10^{-7} *4*

Continued on next page (footnotes at end of table)

^{90}Rh ε decay (0.56 s) 2019Pa16 (continued)

γ(^{90}Ru) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α	Comments
885.7 *2*	41 *7*	2524.0	6^+	1638.31	4^+	E2	1.17×10^{-3}	α(K)=0.001026 *15*; α(L)=0.0001197 *17*; α(M)=2.19×10^{-5} *3*; α(N)=3.54×10^{-6} *5*; α(O)=1.82×10^{-7} *3*
900.2 *2*	85 *11*	1638.31	4^+	738.10	2^+	E2	1.13×10^{-3}	α(K)=0.000988 *14*; α(L)=0.0001150 *17*; α(M)=2.11×10^{-5} *3*; α(N)=3.40×10^{-6} *5* α(O)=1.755×10^{-7} *25*
1163.9 *2*	26 *6*	2802.2	(6^+)	1638.31	4^+	[E2]	6.36×10^{-4}	α(K)=0.000555 *8*; α(L)=6.36×10^{-5} *9*; α(M)=1.164×10^{-5} *17*; α(N)=1.88×10^{-6} *3*; α(O)=9.89×10^{-8} *14*
1316.6 *2*	20 *6*	2954.9	(6^+)	1638.31	4^+	[E2]	5.17×10^{-4}	α(K)=0.000428 *6*; α(L)=4.88×10^{-5} *7*; α(M)=8.92×10^{-6} *13*; α(N)=1.444×10^{-6} *21*; α(O)=7.64×10^{-8} *11*

[†] From the Adopted Levels.
[‡] For absolute intensity per 100 decays, multiply by 0.904 *10*.

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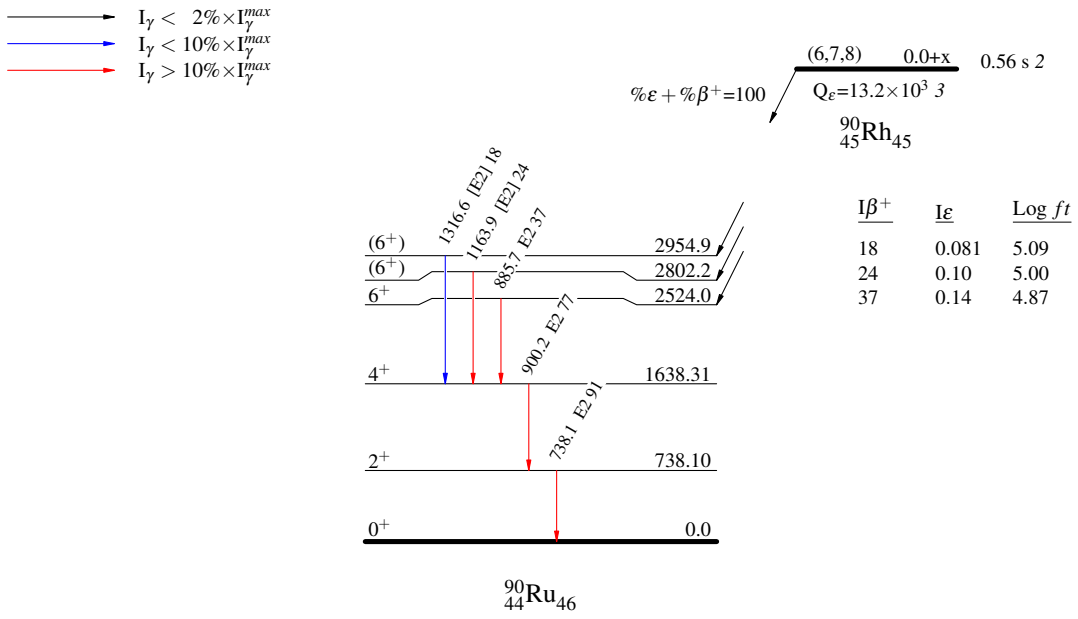
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



$^{90}_{44}Ru_{46}$