Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 147, 1 (2018)	30-Nov-2017

Q(β^-)=−705×10[1] *14*; S(n)=9540 *60*; S(p)=−150 *80*; Q(α)=5926 *5* 2017Wa10
S(2n)=21110 *200* (syst), S(2p)=2270 *80*, Q(εp)=7770 *70* (2017Wa10).
1981Ho10, 1979Ho10: ^{164}Re produced and identified in ^{109}Ag(^{58}Ni,xnyp),E=275 MeV reaction, using velocity filter, and ion implantation in Si surface-barrier and position-sensitive detectors.
Later studies of ^{164}Re decay:
Additional information 1.

^{164}Re Levels

Cross Reference (XREF) Flags

A ^{168}Ir α decay (220 ms)
B ^{168}Ir α decay (159 ms)

E(level)	$T_{1/2}$	XREF	Comments
0	0.70 s *16*	A	%α≈58; %ε+%β^+≈42 %ε+%β^+: from gross β-strength function calculations of 1973Ta30 as quoted by 1979Ho10. J^π: very tentative 2^- for g.s. and 9^+ for isomeric state based on the following considerations: for Z=75, valence proton orbitals are $h_{11/2}$, $d_{3/2}$, and $s_{1/2}$; and for N=89, valence neutron orbitals are $h_{9/2}$, $f_{7/2}$, and $i_{13/2}$. In neighboring ^{166}Ir odd-odd nucleus, following configurations and J^π were proposed by 1997Da07: $[\pi d_{3/2}\otimes\nu f_{7/2}]_{2-}$ for α-decaying g.s. and $[\pi h_{11/2}\otimes\nu f_{7/2}]_{9+}$ for α-decaying isomeric state. The J^π assignments for these configurations were based on the Nordheim rules. Similar assignments were suggested for the α-decaying g.s. and isomeric state in ^{170}Au by 2004Ke06 and for ^{172}Au by 2009Ha42. It is possible that the α-decay chain ^{172}Au → ^{168}Ir → ^{164}Re → ^{160}Ta → ^{156}Lu → ^{152}Tm follows a trend of α decays of 2^- g.s. and 9^+ isomeric state, as the J^π=2^- for the ground states and 9^+ for the isomers in ^{156}Lu and ^{152}Tm seem fairly secure. 2017Au03 (in NUBASE-2016) assign (2^-) for g.s. and (9^+) for the isomeric state, probably from favored α-decay chain starting with ^{172}Au and ending in ^{152}Tm, as shown above. $T_{1/2}$: weighted average of 0.85 s *+14−11* (2009Ha42), 0.38 s *16* (1996Pa01), and 0.88 s *24* (1979Ho10,1981Ho10).
0+x	0.86 s *+15−11*	B	%α=3 *1* (2009Ha42); %ε+%β^+=97 *1* E(level): x=−50 *250* (systematics, 2017Au03). J^π: very tentative 9^+, see comment for g.s. $T_{1/2}$: from 2009Ha42.
69.4+x		B	

γ(^{164}Re)

E_i(level)	E_γ	E_f	Comments
69.4+x	69.4 *4*	0+x	E_γ: from 2009Ha42.

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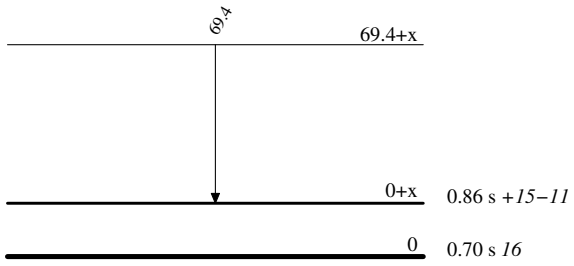
Level Scheme



$^{164}_{75}Re_{89}$