^{160}Re IT decay (2.8 μs)   2011Da01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Parent: ^{160}Re: E=184 *4*; J^{π}=(9$^+$); $T_{1/2}$=2.8 μs *1*; %IT decay=?

2011Da01 was compiled for XUNDL database by F.G. Kondev (ANL).

E=290 MeV (68 hours of beam time) and 300 (75 hours of beam time). Reaction products separated by the gas-filled recoil separator RITU, and implanted into double-sided silicon strip detectors (DSSD) of the GREAT spectrometer. Measured E$\gamma(\alpha$,p), I$\gamma(\alpha$,p), recoil-$\gamma(\alpha$, p)-γ-t).

The assignment of delayed γ rays to ^{160}Re was made by their correlations with characteristics proton and alpha decay of the ^{160}Re ground state. However, the exact placement of those γ rays in the level scheme in not unambiguous, so the proposed isomer decay scheme in 2011Da01 should be considered as tentative.

^{160}Re Levels

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
0.0	(4$^-$)	612 μs *7*	%p=89 *1*; %α=11 *1*
			%p,%α: adopted values, from 2011Da12 assuming β decay branch is negligible. Other values: %p=91 *5*, %α=9 *5* (1996Pa01).
			J^{π}: proposed by 2011Da01 from the existence of an E2→E1→E2 γ cascade (where the last transition is assumed E2) from the expected (but previously unobserved) 9$^+$ isomer in ^{160}Re. The final state in this cascade is assumed to be the ^{160}Re g.s. Previously (2$^-$) was assumed from proposed configuration, with antiparallel coupling of a d$_{3/2}$ proton orbital and an f$_{7/2}$ neutron orbital (1993Li34).
			configuration: possible πd$_{3/2}\otimes\nu$f$_{7/2}$ or πd$_{3/2}\otimes\nu$h$_{9/2}$ (2011Da01).
			$T_{1/2}$: adopted value, weighted average of 614 μs *8*, p(t), and 597 μs *20*, α(t), both from 2011Da12. Others: 790 μs *160*, from 860 μs +230−150, p(t), and 380 μs +38−13, α(t), all from 1992Pa05.
50 *3*	(6$^-$)		
88 *4*	(7$^+$)		
184 *4*	(9$^+$)	2.8 μs *1*	J^{π}: expected from systematics and theoretical arguments.
			$T_{1/2}$: from 38γ+96γ(t) in 2011Da01.
			configuration: possible πh$_{11/2}\otimes\nu$f$_{7/2}$ or πh$_{11/2}\otimes\nu$h$_{9/2}$.

† From Eγ data, same as the adopted values.

‡ From 2011Da01, unless otherwise stated. Same values are adopted.

$\gamma(^{160}$Re)

E$_\gamma$[†]	E$_i$(level)	J_i^{π}	E$_f$	J_f^{π}	Mult.[†]	α[‡]	Comments
38 *1*	88	(7$^+$)	50	(6$^-$)	(E1)	1.02 *8*	α(L)=0.79 *6*; α(M)=0.184 *15* α(N)=0.043 *4*; α(O)=0.0062 *5*; α(P)=0.000223 *14* Mult.: from the prompt relationship between 38γ and 96γ and the intensity balance (2011Da01).
50[#] *3*	50	(6$^-$)	0.0	(4$^-$)	[E2]	90 *32*	α(L)=68 *25*; α(M)=17.4 *62* α(N)=4.1 *15*; α(O)=0.58 *21*; α(P)=5.2×10^{-4} *14* E$_\gamma$: although a γ ray of this energy is visible in the singles spectra (2011Da01, Fig. 2a), no evidence of it from $\gamma\gamma$ coin. was presented by the authors.
96 *1*	184	(9$^+$)	88	(7$^+$)	(E2)	4.86 *23*	α(K)=0.891 *18*; α(L)=3.00 *16*; α(M)=0.76 *4* α(N)=0.181 *10*; α(O)=0.0258 *14*; α(P)=8.52×10^{-5} *25* Mult.: α(K)exp=1.2 *4* deduced from Iγ(K x ray) and Iγ(96γ) (α(K)=0.891 *18* theory). Additional information 1.

Continued on next page (footnotes at end of table)

^{160}**Re IT decay (2.8 μs)   2011Da01 (continued)**

$\gamma(^{160}$Re) (continued)

† From 2011Da01, unless otherwise stated. ΔEγ was estimated by evaluator. All values are adopted.
‡ Additional information 2.
# Placement of transition in the level scheme is uncertain.

^{160}**Re IT decay (2.8 μs)   2011Da01**   Legend

Decay Scheme

%IT=?

- - - - - - ▶ γ Decay (Uncertain)

$^{160}_{75}$Re$_{85}$