^{164}Ir p decay (70 μs) 2014Dr02,2001Ke05,2002Ma61

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	10-Jun-2015

Parent: ^{164}Ir: E=0+x; J^π=(9^+); $T_{1/2}$=70 μs *10*; Q(p)=1560 *SY*; %p decay=96 *2*

^{164}Ir-E: From difference between the Q value deduced from the E(p) value (assuming that the p transition directly populates the ^{163}Os g.s.) and the S(p)(^{164}Ir)=1560 *110* (syst,2012Au07), evaluator deduces x=265 *110*. 2012Au07 give 280 *110* from syst.

^{164}Ir-J^π: Possible high-spin level, by analogy with the situation in ^{166}Ir (2003Au02). High spin supported by l=5 proton emission to a lower-spin state (probably $7/2^-$) in ^{163}Os. Probable configuration is $\pi h_{11/2}\otimes\nu f_{7/2}$.

^{164}Ir-$T_{1/2}$: From 2014Dr02, extracted from observed 100 ^{164}Ir proton-decay events using the Maximum Likelihood method. 69 μs *+41−29* was extracted from four α-decay events. Others: 113 μs *+62−30* (2001Ke05) and 58 μs *+46−18* (2002Ma61). Weighted average of all the three values is 71 μs *+12−6*.

^{164}Ir-From the $T_{1/2}$ value, 2001Ke05 conclude that the proton emission is characterized by l=5 and involves the $\pi h_{11/2}$ orbital. The subsequent studies agree with this conclusion.

^{164}Ir-Q(p): 1560 *110* (syst,2012Wa38).

^{164}Ir-2014Dr02 deduced an α-decay reduced width of 33 keV *17* and a reduced proton-decay width of 0.29 *4* from measured half-life and decay branching ratios.

^{164}Ir-%p decay: From 2014Dr02 based on %α=4 *2* deduced by 2014Dr02 from observed ^{164}Ir α-decay yield (four events) and proton-decay yield (≈100 events).

2014Dr02: ^{164}Ir nuclei were produced in the fusion-evaporation reaction ^{92}Mo(^{78}Kr, p5n) with E=428, 435 and 450 MeV ^{78}Kr beams from the K130 cyclotron at the Accelerator Laboratory of the University of Jyvaskyla bombarding a isotopically enriched, self-supporting ^{92}Mo target foil of 500 μm/cm^2 thickness. Evaporation residues were separated and transported using the gas-filled separator ion transport unit (RITU) to the GREAT spectrometer. The ions passed through a multiwire proportional counter (MWPC) and were implanted into two adjacently mounted DSSDs. Measured Eα, Iα, E(p), I(p), recoil-decay correlations, decay time distribution. Deduced ^{164}Ir isomer half-life, decay branching ratios, decay widths. Comparisons with available data. About 100 ^{164}Ir $\pi h_{11/2}$ isomer proton-decay events and 4 α-decay events were observed and identified from correlations with the α decay of daughter nuclei in 2014Dr02. No evidence was found for the proton decay of the ^{164}Ir $\pi d_{3/2}$ ground state, which may be due to either too low a production yield or too short a half-life (<0.5 μs).

2002Ma61: ^{164}Ir produced in the bombardment of a ^{92}Mo target by a 437-MeV ^{78}Kr beam. Reaction products analyzed in the ANL fragment mass analyzer and implanted into a double-sided Si strip detector. Report $T_{1/2}$ and E(p).

2001Ke05: ^{164}Ir produced in the ^{106}Cd(^{64}Zn,p5n) fusion-evaporation reaction. Reaction products analyzed in the gas-filled recoil separator RITU and implanted into a position-sensitive Si strip detector. $T_{1/2}$ and E(p) reported.

See also 2003SeZZ. 2007Me28 discuss systematics of half-lives for proton decay.

Additional information 1.

^{163}Os Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	($7/2^-$)	5.5 ms *6*	J^π,$T_{1/2}$: from the Adopted Levels.

Protons (^{163}Os)

E(p)	E(^{163}Os)	I(p)	Comments
1814 *6*	0.0	100	E(p): weighted average of 1814 *6* (2014Dr02), 1807 *14* (2002Ma61), and 1817 *9* (2001Ke05). Other: 1778 *13* (2001DaZU, the same group as 2002Ma61).