Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

Q(β^-)=−11280 *syst*; S(n)=12180 *syst*; S(p)=−1540 *syst*; Q(α)=6820 *syst* 2021Wa16

Estimated uncertainties (2021Wa16): ΔQ(β^-)=430, ΔS(n)=350, ΔS(p)=ΔQ(α)=50 (syst, 2021Wa16).

S(2n)=22430 *430*, S(2p)=170 *160*, Q(ε)=10150 *260*, Q(εp)=8590 *150* (syst, 2021Wa16).

S(p),Q(α): others: S(p)=−1503 *110*, (1997Da07, including electron screening), Q(α)=6776 *110* (1997Da07), see comment for 327-ms isomer.

1997Da07: ^{92}Mo(^{78}Kr,p4n),E=384 MeV; recoil mass separator with PPAC/DSSD detectors at focal plane (FMA) at ATLAS-ANL facility.

2001Ke05: ^{106}Cd(^{64}Zn,p4n), gas-filled recoil separator RITU system.

2014Dr02: ^{165}Ir nuclei were produced in the fusion-evaporation reaction ^{92}Mo(^{78}Kr,p4n) with E=428, 435 and 450 MeV ^{78}Kr beams from the K130 cyclotron at the Accelerator Laboratory of the University of Jyvaskyla, bombarding an 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 ^{165}Ir isomer half-life, decay branching ratios. About 270 ^{165}Ir πh$_{11/2}$ isomer proton-decay events and 35 α-decay events were observed and identified from correlations with the α decay of daughter nuclei.

Theoretical calculations: consult Nuclear Science References (NSR) database primary references dealing mostly with various aspects of proton decay of ^{165}Ir.

^{165}Ir Levels

E(level)	J$^\pi$	T$_{1/2}$	Comments
0?	(1/2$^+$)	<1 μs	%p=?; %α=? E(level),J$^\pi$: the ground state of ^{165}Ir has not yet been identified; from systematics, s$_{1/2}$ orbital is expected to lie below h$_{11/2}$ orbital (2021Ko07). T$_{1/2}$: <1 μs from calculations for Q(p)=1503 and J^π=1/2$^+$, in agreement with lower value from time-of-flight measurement in FMA (1997Da07); 50 ns from systematics (2021Ko07). No evidence was found by 2014Dr02 for the ground state decay of ^{165}Ir.
0+x	(11/2$^-$)	327 μs *40*	%p=88 *2*; %α=12 *2* (2014Dr02) %p and %α in 2014Dr02 were based on observed ^{165}Ir α-decay yield with 35 events, and proton-decay yield with 270 events. Values of %p=87 *4*, %α=13 *4* measured by 1997Da07 are nearly the same, but somewhat less precise. Deduced reduced proton width=0.30 *5* (2014Dr02). E(level): x=230 *110* (1997Da07) from systematics of energy differences between the s$_{1/2}$ and h$_{11/2}$ orbitals in ^{153}Lu, ^{157}Ta and ^{161}Re. Other: 180 *50* proposed from systematics (2021Ko07). T$_{1/2}$: weighted average of 340 μs *40* (2014Dr02, maximum likelihood method applied for decay events), 0.39 ms *16* (1997Da07, α decay curve) and 0.29 ms *6* (1997Da07, protons decay curve). J$^\pi$: E(p)=1707 *7* (1997Da07), Q(p)=1733 *7*, %p=87 *4*, J^π=11/2$^-$ give calculated T$_{1/2}$(p)=0.34 ms *7*, in agreement with the experimental value. Configuration=πh$_{11/2}$. E(α)=6715 *7* (1997Da07) from the decay of ^{165}Ir isomer. Production $\sigma\approx$0.2 μb (1997Da07) in ^{92}Mo(^{78}Kr,p4n),E=384 MeV.