Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 191,1 (2023)	22-Aug-2023

Q(β^-)=−10320 *syst*; S(n)=11840 *syst*; S(p)=−1070 *4*; Q(α)=6504.9 *26* 2021Wa16
ΔQ(β^-)=310, ΔS(n)=200 (syst,2021Wa16).
S(2n)=21620 *160* (syst), S(2p)=991 *30*, Q(εp)=7480 *90*, Q(ε)=9430 *80* (2021Wa16).

1981Ho10: ^{167}Ir produced and identified in ^{112}Sn(^{58}Ni,p2n), E(^{58}Ni)=4.4 MeV/nucleon, followed by mass separation using the velocity filter SHIP at the UNILAC facility of GSI. The evaporation residues were implanted into an array of seven position sensitive silicon detectors. Measured Eα=6386 *10*, $T_{1/2}$>5 ms for the decay of ^{167}Ir, and α(Re daughter decays)-correlations.

1997Da07: ^{167}Ir produced in ^{92}Mo(^{78}Kr,X),E=357 MeV reaction, followed by mass separation using fragment mass analyzer (FMA), and detection of recoils, α and protons using position-sensitive parallel plate avalanche counter at focal plane, and a double-sided Si strip detector (DSSSD) at the ATLAS-ANL facility. Measured E(p), Eα, decay curves for protons, production σ, and (recoils)pα correlations.

Additional information 1.

2004Ke06 (also 2001Ke05): ^{167m}Ir from ^{171m}Au α decay, the latter produced in ^{96}Ru(^{78}Kr,p2n),E=360-391 MeV, followed by mass separation using RITU separator at the cyclotron facility of the University of Jyvaskyla. The recoils were implanted in the double-sided silicon-strip detectors. Measured Eα, E(p), %p, %α, (recoils)α and (recoils)p correlations, and half-lives of the decay of the isomer of ^{167}Ir. Recoil decay tagging method.

2005Sc22: ^{167}Ir from ^{171}Au α decay, the latter produced in ^{92}Mo(^{78}Kr,p2n),E=360 MeV, followed by mass separation using RITU separator at the cyclotron facility of the University of Jyvaskyla. The recoils were implanted in the double-sided silicon-strip detectors of the GREAT spectrometer, with the γ rays detected using the JUROGAM array of 43 escape-suppressed Ge detectors. Measured Eα, E(p), Eγ, %p, %α, (recoils)α and (recoils)p correlations, and half-lives of the decays of the ground state and the isomer. Recoil decay tagging method.

High-spin studies: 1998CaZZ, 1999CaZW: ^{78}Kr(^{92}Mo,2npγ), E=360 MeV. Measured Eγ, Iγ, $\gamma\gamma$-coin, and (recoil)γ-coin using Gammasphere array, and fragment mass analyzer (FMA) at ATLAS-ANL facility. Recoil-decay tagging method. Gamma-ray spectra shown in Figs. 1-15a and 1.15b, the first correlated with A=167 residues, and the second correlated with the α-decay of the $11/2^-$ isomeric state in ^{167}Ir. Authors mentioned that preliminary decay scheme suggested states built on the 11/2 isomer, associated with a weakly deformed or spherical shape. No details of γ-ray energies and intensities, and level scheme are available.

Note: ^{171}Au g.s. decays only by proton emission to ^{170}Pt, not by α decay mode to ^{167}Ir.

No reference was found in the NSR database for theoretical structure calculation for ^{167}Ir.

^{167}Ir Levels

Cross Reference (XREF) Flags

A ^{171}Au α decay (1.04 ms)

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	$1/2^+$	30.2 ms *10*		%p=39.0 *15*; %α=43.5 *20*; %ε+%β^+=17.5 *25* %α=43.5 *20* from weighted average of %α=43 *2* (2005Sc22) and 48 *6* (1997Da07). %p=39.0 *15* from weighted average of %p=39.3 *13* (2005Sc22) and 32 *6* (1997Da07). %ε+%β^+=17.5 *25* from 100−(summed %α and %p). J^π: from considerations of $s_{1/2}$ proton-decay mode of ^{167}Ir, and comparison of experimental half-life with theoretical half-lives calculated for $s_{1/2}$, $d_{3/2}$ and $h_{11/2}$ proton emission for ^{167}Ir (odd-Z, even-N nucleus) using Wentzel-Kramers-Brillouin (WKB) barrier penetration approximation (1997Da07, 2001Da31, 2005Sc22). $T_{1/2}$: weighted average of 30.9 ms *13* (2005Sc22, α decay); 29.3 ms *6* (2005Sc22, proton decay); 39.7 ms *49* (1997Da07, α decay); and 34.3 ms *22* (1997Da07, proton decay). Reduced χ^2 of 4.1 is somewhat higher than critical χ^2=2.6. Unweighted average is 32.4 ms *14*. Other: >5 ms (1981Ho10). E(p)=1062 *6* (2005Sc22), 1064 keV *6* (1997Da07) from the decay ^{167}Ir g.s. Weighted average

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Adopted Levels (continued)

^{167}Ir Levels (continued)

E(level)	J^π	$T_{1/2}$	XREF	Comments
				E(p)=1063 *6*. Eα=6348 *3* (2005Sc22), 6351 *4* (2001Da31, earlier value of 6351 *5* in 1997Da07) from the decay ^{167}Ir g.s. Weighted average Eα=6349 *3*. Production $\sigma\approx10$ μb (1997Da07).
175.3 *22*	11/2$^-$	28.6 ms *9*	A	%p=0.42 *8*; %α=90 *3*; %ε+%β^+=9.6 *30* %α=90 *3* from weighted average of %α=90 *3* (2005Sc22) and 80 *10* (1997Da07). %p=0.42 *8* from weighted average of %p=0.42 *8* (2005Sc22) and 0.4 *1* (1997Da07). %ε+%β^+=9.6 *30* from 100−(summed %α and %p). E(level): from energy differences of proton peaks from the two activities of ^{167}Ir (2001Da31). J^π: from considerations of $h_{11/2}$ proton-decay mode of ^{167}Ir, and comparison of experimental half-life with theoretical half-lives calculated for $s_{1/2}$, $d_{3/2}$ and $h_{11/2}$ proton emission for ^{167}Ir (odd-Z, even-N nucleus) using Wentzel-Kramers-Brillouin (WKB) barrier penetration approximation (1997Da07, 2001Da31, 2005Sc22). $T_{1/2}$: weighted average of the following values: 28.8 ms *13* (2005Sc22, proton decay); 28.7 ms *33* (2005Sc22, α decay); 25.7 ms *8* (2004Ke06, α decay); 30.0 *6* ms (1997Da07, α decay); 34 ms *9* (1997Da07, proton decay); and 34 ms *4* (1996Pa01, α decay). Reduced χ^2 of 4.2 is somewhat higher than critical χ^2=2.2. Unweighted average is 30.2 ms *13*. E(p)=1248 *7* (2005Sc22), 1238 keV *7* (1997Da07) from the decay of ^{167}Ir isomer. Weighted average E(p)=1243 *7*. E(α)=6404 *6* (2005Sc22), 6394 *2* (2004Ke06), 6410 *5* (1997Da07), 6410 *11* (1996Pa01), 6386 *10* (1981Ho10) from the decay of ^{167}Ir isomer. Weighted average Eα=6397 *3*. Production $\sigma\approx100$ μb (1997Da07).