

**<sup>169</sup>Ir  $\alpha$  decay (0.280 s) 2012Th13,1999Po09,1996Pa01**

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

Parent: <sup>169</sup>Ir: E=153 24; J <sup>$\pi$</sup> =(11/2<sup>-</sup>); T<sub>1/2</sub>=0.280 s I; Q( $\alpha$ )=6141 4; % $\alpha$  decay=79 6

<sup>169</sup>Ir-E,J <sup>$\pi$</sup> : From 1999Po09.

<sup>169</sup>Ir-T<sub>1/2</sub>: weighted average of 0.280 s I (2012Th13), 0.29 s I (2004GoZZ), 0.32 s +9-7 (1999Po09), 0.308 s 22 (1996Pa01).

Others: 0.280 s 3 (2005Sc22), 0.40 s 9 (1978Ca11,1978Sc26).

<sup>169</sup>Ir-Q( $\alpha$ ): From 2021Wa16.

<sup>169</sup>Ir-% $\alpha$  decay: % $\alpha$ =79 6 from weighted average of % $\alpha$ =78 6 (2012Th13), 84 8 (1999Po09), and 72 13 (1996Pa01). Others: 59 4 (2005Sc22), 83 +17-42 (1984ScZQ).

2012Th13: <sup>169</sup>Ir from  $\alpha$ -decay of <sup>173</sup>Au, where <sup>173</sup>Au nuclei were produced by bombarding a 0.5 mg/cm<sup>2</sup> <sup>92</sup>Mo target of 97% enrichment with a beam of <sup>84</sup>Sr<sup>16+</sup> ions from the k130 cyclotron of the Accelerator Laboratory of the University of Jyväskylä. Recoiling residues were separated using the RITU He-filled magnetic separator and traversed an isobutane-filled multiwire proportional chamber (MWPC) and implanted into a 300- $\mu$ m-thick DSSD in the GREAT spectrometer. Measured E $\alpha$ , I $\alpha$ , recoil- $\alpha$ -correlation, Deduced isomers, Q $\alpha$ ,  $\alpha$ -decay branching ratios, T<sub>1/2</sub>, reduced widths, hindrance factors.

2005Sc22: sources from <sup>112</sup>Sn(<sup>60</sup>Ni,p2n) at 266 MeV. Recoil nuclei of <sup>169</sup>Ir analyzed by RITU Fragment Mass Analyzer, recoil-decay tagging method. Recoils implanted in silicon-strip detectors of the GREAT spectrometer. Measured E $\alpha$ , I $\alpha$ . This work is from the same laboratory as 2012Th13.

Additional information 1.

1999Po09: sources from <sup>177</sup>Tl-<sup>173</sup>Au-<sup>169</sup>Ir  $\alpha$  decay chain. <sup>177</sup>Tl produced by <sup>102</sup>Pd(<sup>78</sup>Kr,X) at 370 MeV at ANL. Recoil nuclei of <sup>177</sup>Tl analyzed by Fragment Mass Analyzer. Measured E $\alpha$ , I $\alpha$ .

1996Pa01: <sup>169</sup>Ir produced in heavy-ion reactions followed by recoil-mass separation at the Daresbury Laboratory Nuclear Structure Facility. Measured E $\alpha$ , T<sub>1/2</sub> and branching.

1982De11: sources from <sup>108</sup>Cd(<sup>63</sup>Cu,2n), <sup>110</sup>Cd(<sup>63</sup>Cu,4n) (E(<sup>63</sup>Cu)=245-300 MeV, helium-jet transport); enriched targets; measured E $\alpha$ , I $\alpha$  (silicon surface-barrier detector).

1978Ca11: sources from <sup>63</sup>Cu bombardments of cadmium, silver, and palladium (helium-jet transport); measured E $\alpha$ , I $\alpha$ .

Others: 1984ScZQ, 1978Sc26.

<sup>165</sup>Re Levels

E(level)	J <sup><math>\pi</math></sup>	T <sub>1/2</sub>	Comments
48 26	(11/2 <sup>-</sup> )	1.74 s 6	% $\epsilon$ +% $\beta$ <sup>+</sup> =87 I; % $\alpha$ =13 I E(level),J <sup><math>\pi</math></sup> : From 1999Po09. T <sub>1/2</sub> : from the Adopted Levels.

$\alpha$  radiations

E $\alpha$	E(level)	I $\alpha$ <sup>‡</sup>	HF <sup>†</sup>	Comments
6119 5	48	100	1.4 5	E $\alpha$ : weighted average (LWM) of 6120 14 (2005Sc22), 6106 5 (1999Po09), 6119 9 (1996Pa01,2004GoZZ), 6127 3 (1982De11) and 6110 10 (1978Ca11). Others: 6117 3 (2005Sc22), 6070 10 (1978Sc26). I $\alpha$ : Only one $\alpha$ branch is reported. Reduced $\alpha$ width=70 keV 10 (2012Th13), 54 keV (2005Sc22), 72 keV 11 (1999Po09).

† The nuclear radius parameter r<sub>0</sub>(<sup>165</sup>Re)=1.5639 39 is deduced from interpolation of radius parameters of the adjacent even-even nuclides in 2020Si16.

‡ For absolute intensity per 100 decays, multiply by 0.79 6.