Coulomb excitation 1977Ro08,1982Ha25

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 126, 151 (2015)	1-Feb-2015

1982Ha25: (^{86}Kr,^{86}Kr′γ) and (^{136}Xe,^{136}Xe′γ) with E=384-594 MeV. Measured Eγ, Iγ in coincidence with back-scattered particles using two Ge(Li) detectors at 0° and 90° and two position sensitive avalanche counters; deduced B(E2) from yield analysis and $T_{1/2}$ from Doppler Shift Attenuation Method (DSAM).

1977Ro08: (α,α′), Eα=11-17 MeV. Measured σ(θ) at θ=90° and 150° using Enge split-pole magnetic spectrograph with position sensitive proportional counter at focal plane (FWHM=18-25 keV). See 1977Ro26 and 1978Ro02 by similar authors where E2 and E4 reduced transition matrix elements to the 93.3 (2^+) and 308.6 (4^+) levels are determined.

Others: 1955He64 (α,α′γ), 1955Mc44 (p,p′γ), 1958Ch36 (p,p′γ), 1959Bi10 (p,p′γ), 1961Go09 (p,p′γ), 1961Ha21 (p,p′γ), 1963Gr04 (^{16}O,^{16}O′γ), 1964De07 (^{16}O,^{16}O′γ), 1974Va09 (α,α′γ), 1984Gu22 (Ar,Ar′γ), 1988Ne07 (α,α′).

α: Additional information 1.

^{180}Hf Levels

E(level)†	Jπ†	$T_{1/2}$‡	Comments
0.0#	0^+		
93.290# *20*	2^+	1.50 ns *2*	B(E2)↑=4.73 *5* (1977Ro08,1977Ro26) $T_{1/2}$: from B(E2)=4.73 *5* (1977Ro08,1977Ro26) and α=4.64. Others: 1.44 ns *10* from B(E2)=4.93 *35* (1963Gr04), 1.63 ns *8* from B(E2)=4.35 *20* (1961Ha21), and 1.65 ns *11* from centroid shift method (1959Bi10). Others: 1955He64, 1955Mc44, 1961Go09, 1964De07, 1977Ro26. g-factor=0.263 *15* from IPAD with $T_{1/2}$=1.50 ns *2* (1968Be04). This supercedes early result by same group of g=0.313 *35* (1967Gi02). Other: 1961Bo25. B(E2)↑: others: 4.39 (1955He64), 4.3 *7* (mean value for ^{178}Hf and ^{180}Hf, 1961Go09), 4.3 (1964De07).
308.6# *10*	4^+	86 ps	B(E2)↑=2.1 (1964Al25) $T_{1/2}$: from B(E2)=2.1 (1964Al25) and α=0.225.
640.9# *15*	6^+	10.0 ps *7*	
1084.1# *18*	8^+	2.18 ps *11*	
1199.5 *7*	2^+	0.51 ps *5*	$T_{1/2}$: from B(E2)=0.113 *7*, weighted average of 0.114 *7* (1977Ro08) and 0.110 *11* (1974Va09), and (1199.7γ)-adopted branching=51% *4*.
1630.6# *20*	10^+	0.79 ps *4*	
2272.6# *23*	12^+	0.37 ps *3*	

† From the Adopted Levels.

‡ From 1982Ha25, except where noted. Results of 1982Ha25 are weighted averages of lifetimes obtained using the Doppler Shift Attenuation Method (DSAM) and through Coulomb excitation yield measurements.

$K^\pi=0^+$ g.s. rotational band.

γ(^{180}Hf)

Eγ†	Ei(level)	J_i^π	Ef	J_f^π	Mult.	δ	α	Comments
93.29 *2*	93.290	2^+	0.0	0^+	E2		4.64	Eγ: from 1958Ch36.
215.3	308.6	4^+	93.290	2^+	E2		0.225	
332.3	640.9	6^+	308.6	4^+	E2		0.0586	
443.2	1084.1	8^+	640.9	6^+	E2		0.0264	
546.5	1630.6	10^+	1084.1	8^+	E2		0.01552	
642.0	2272.6	12^+	1630.6	10^+	E2		0.01060	
1106.0	1199.5	2^+	93.290	2^+	M1+E2	9.6 *+22−58*	0.00338 *18*	δ: from γ(θ) in 1974Va09. Other: 0.7 *2* is

Continued on next page (footnotes at end of table)

Coulomb excitation 1977Ro08,1982Ha25 (continued)

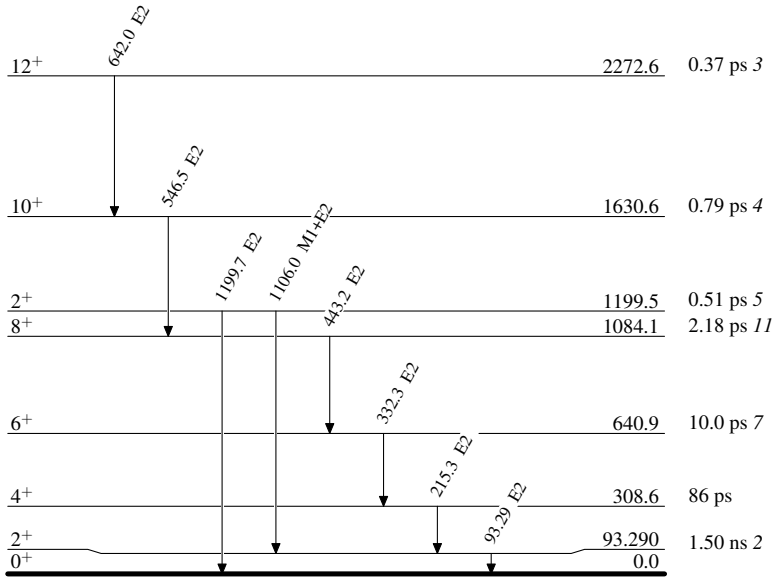
$\gamma(^{180}Hf)$ (continued)

E_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α	Comments
							not favored when considering systematics of similar transitions in this region.
1199.7	1199.5	2^+	0.0	0^+	E2	0.00285 *4*	

† From the Adopted Levels, except where noted.

Coulomb excitation 1977Ro08,1982Ha25

Level Scheme



$^{180}_{72}Hf_{108}$