

$^{180}\text{Hf}(\gamma, \gamma')$ **1997Pi08**

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

$E_\gamma = 4.3\text{-MeV}$ endpoint bremsstrahlung radiation on target enriched to 94.3% ^{180}Hf . Measured E_γ , I_γ , $\gamma(\theta)$ at $\theta=90^\circ$, 127° , and 150° using three HPGe detectors; deduced branching ratios, $I_{s,0}$ and Γ_0 . See also [1997PiZY](#).

Others: [1996KaZP](#), [1997Be58](#), [1997Be76](#), [1997Og05](#), [1997LaZZ](#), [1999To05](#), [1999Ab39](#), [1999Ab40](#), [2001De51](#).

 ^{180}Hf Levels

E(level) [†]	J^π [‡]	$T_{1/2}$ [#]	R_{exp} [@]	E(level) [†]	J^π [‡]	$T_{1/2}$ [#]	R_{exp} [@]
0.0	$0^+ \&$			3506.8 10	1,2	77 fs 16	
93.3 $\&$ 3	$2^+ \&$			3559.4 8	1	12.8 fs 23	1.03 24
2120.1? 10	1,2	0.46 ps 22		3569.3 8	1	30 fs 6	0.42 18
2377.7 10	1	0.29 ps 7		3584.0 8	1	7.3 fs 19	1.6 4
2493.3 8	1	62 fs 13	0.39 17	3592.3 8	1	16 fs 4	1.1 4
2582.3 8	1	10 fs 3	1.84 25	3614.9 8	1	13.0 fs 13	0.17 6
2617.2 8	1	9.5 fs 8	0.55 6	3627.1 10	1	51 fs 12	
2712.3 8	1	12.4 fs 24	2.0 4	3766.4 8	1	10.0 fs 14	0.46 12
2812.4 10	1	0.16 ps 3		3774.1 8	1	4.7 fs 19	3.1 10
2879.8 10	1,2	0.25 ps 7		3786.0 8	1	8.6 fs 18	1.1 3
2892.1 8	1	20.0 fs 21	0.52 10	3803.9 8	1	16 fs 3	0.44 15
2947.8 8	1	13.0 fs 9	0.44 5	3818.0 10	1	40 fs 8	
2993.1 10	1	47 fs 5		3829.6 10	1	25 fs 5	
3011.1 8	1	30 fs 6	0.88 22	3836.3 8	1	14.7 fs 24	0.29 7
3068.6 8	1	14.1 fs 13	0.84 10	3851.5 8	1	7.0 fs 14	0.9 3
3081.5 10	1	0.17 ps 5		3862.2 10	1,2	69 fs 22	
3086.0 10	1	0.14 ps 3		3889.4 10	1	12.6 fs 16	
3125.4 8	1	29 fs 3	0.36 9	3928.0 10	1	22 fs 4	
3150.5 8	1	10 fs 4	3.3 10	3948.1 10	1	25 fs 6	
3254.1 8	1	32 fs 8	0.99 26	3967.8 10	1	18 fs 4	
3330.1 10	1	95 fs 20		3978.2 8	1	1.8 fs 9	3.9 16

[†] As given in [1997Pi08](#).

[‡] From multipolarity of ground state transition determined through angular correlation analysis, except where noted.

[#] Deduced by evaluator from $\Gamma_{\gamma 0}$ and $\Gamma_{\gamma 1}$ calculated from R_{exp} , assuming that only the transition to the first $J^\pi=2^+$ state significantly contributes to the level de-excitation.

[@] $R_{\text{exp}}=(\Gamma_1/E\gamma_1^3)/(\Gamma_0/E\gamma_0^3)$.

$\&$ From the Adopted Levels.

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

$E_i(\text{level})$	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult. [#]	$E_i(\text{level})$	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult. [#]
93.3	2^+	93		0.0	0^+		2712.3	1	2712.3	100	0.0	0^+	D
2120.1?	1,2	2120.1	100	0.0	0^+	(D+Q)	2812.4	1	2812.4	100	0.0	0^+	
2377.7	1	2377.7	100	0.0	0^+	D	2879.8	1,2	2879.8	100	0.0	0^+	(D+Q)
2493.3	1	2400.0	100	93.3	2^+		2892.1	1	2798.8	100	93.3	2^+	
		2493.3	35 17	0.0	0^+	D			2892.1	47 11	0.0	0^+	D
2582.3	1	2489.0	61 27	93.3	2^+		2947.8	1	2854.5	100	93.3	2^+	
		2582.3	100	0.0	0^+	D			2947.8	40 5	0.0	0^+	D
2617.2	1	2523.9	100	93.3	2^+		2993.1	1	2993.1	100	0.0	0^+	D
		2617.2	49 7	0.0	0^+	D	3011.1	1	2917.8	100	93.3	2^+	
2712.3	1	2619.0	56 11	93.3	2^+				3011.1	80 26	0.0	0^+	D

Continued on next page (footnotes at end of table)

$^{180}\text{Hf}(\gamma, \gamma')$ **1997Pi08 (continued)** $\gamma(^{180}\text{Hf})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]	$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]
3068.6	1	2975.3	100	93.3	2 ⁺		3627.1	1	3627.1	100	0.0	0 ⁺	D
		3068.6	77 12	0.0	0 ⁺	D	3766.4	1	3673.1	100	93.3	2 ⁺	
3081.5	1	3081.5	100	0.0	0 ⁺	D			3766.4	43 13	0.0	0 ⁺	D
3086.0	1	3086.0	100	0.0	0 ⁺	D	3774.1	1	3680.8	35 14	93.3	2 ⁺	
3125.4	1	3032.1	100	93.3	2 ⁺				3774.1	100	0.0	0 ⁺	D
		3125.4	33 9	0.0	0 ⁺	D	3786.0	1	3692.7	100	93.3	2 ⁺	
3150.5	1	3057.2	33 12	93.3	2 ⁺				3786.0	99 35	0.0	0 ⁺	D
		3150.5	100	0.0	0 ⁺	D	3803.9	1	3710.6	100	93.3	2 ⁺	
3254.1	1	3160.8	100	93.3	2 ⁺				3803.9	41 16	0.0	0 ⁺	D
		3254.1	91 35	0.0	0 ⁺	D	3818.0	1	3818.0	100	0.0	0 ⁺	D
3330.1	1	3330.1	100	0.0	0 ⁺	D	3829.6	1	3829.6	100	0.0	0 ⁺	D
3506.8	1,2	3506.8	100	0.0	0 ⁺	(D+Q)	3836.3	1	3743.0	100	93.3	2 ⁺	
3559.4	1	3466.1	100	93.3	2 ⁺				3836.3	27 8	0.0	0 ⁺	D
		3559.4	95 29	0.0	0 ⁺	D	3851.5	1	3758.2	100	93.3	2 ⁺	
3569.3	1	3476.0	100	93.3	2 ⁺				3851.5	85 30	0.0	0 ⁺	D
		3569.3	39 19	0.0	0 ⁺	D	3862.2	1,2	3862.2	100	0.0	0 ⁺	(D+Q)
3584.0	1	3490.7	66 18	93.3	2 ⁺		3889.4	1	3889.4	100	0.0	0 ⁺	D
		3584.0	100	0.0	0 ⁺	D	3928.0	1	3928.0	100	0.0	0 ⁺	D
3592.3	1	3499.0	100	93.3	2 ⁺		3948.1	1	3948.1	100	0.0	0 ⁺	D
		3592.3	101 44	0.0	0 ⁺	D	3967.8	1	3967.8	100	0.0	0 ⁺	D
3614.9	1	3521.6	100	93.3	2 ⁺		3978.2	1	3884.9	28 14	93.3	2 ⁺	
		3614.9	16 6	0.0	0 ⁺	D			3978.2	100	0.0	0 ⁺	D

[†] Only level energies are reported in [1997Pi08](#). For ground state transitions, E_γ is taken as the reported level energy. For transitions to the 93.3-keV level, E_γ 's are from level energy differences.

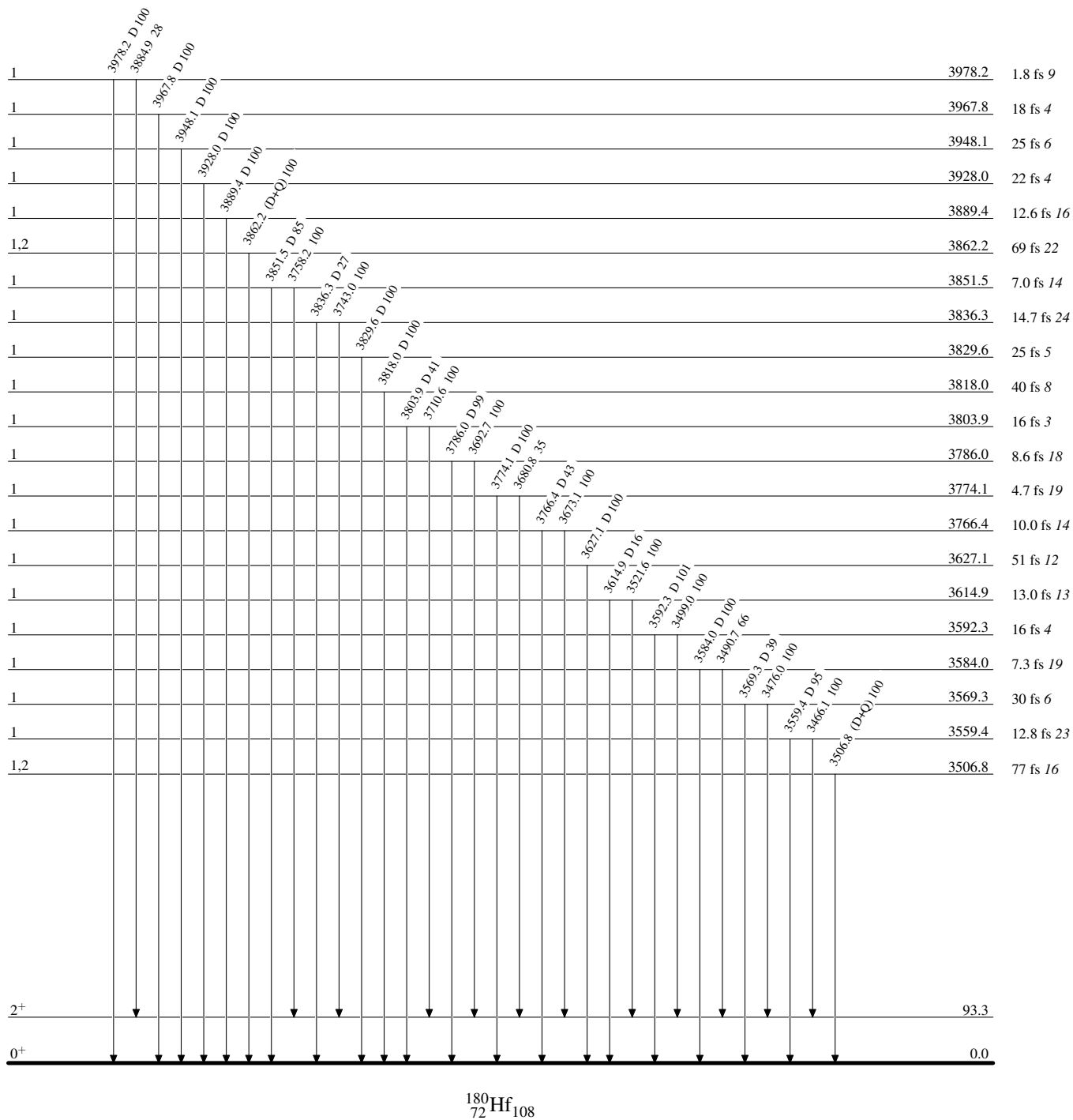
[‡] Deduced by evaluator from R_{exp} .

[#] From angular correlation ratio $W(90^\circ)/W(127^\circ)$.

$^{180}\text{Hf}(\gamma, \gamma')$ 1997Pi08

Level Scheme

Intensities: Relative photon branching from each level



$^{180}\text{Hf}(\gamma, \gamma')$ 1997Pi08

Level Scheme (continued)

Intensities: Relative photon branching from each level

