

$^{180}\text{Hf}(^{238}\text{U}, ^{236}\text{U}\gamma)$ 1999Da09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 130, 21 (2015)	15-Jul-2015

1999Da09 (also 2001Ch89,2001Ch10,1999Ch48): isomer produced and identified in $^{180}\text{Hf}(^{238}\text{U}, ^{236}\text{U}\gamma)$ E=1.6 GeV and $^{180}\text{Hf}(^{208}\text{Pb}, ^{206}\text{Pb}\gamma)$ E=1.3 GeV. Also natural Hf target used. Both reactions involve 2-neutron transfer.

Pulsed beam. Measured γ , $\gamma\gamma$, $T_{1/2}$ using an array of 12 Compton-suppressed Ge detectors for ^{238}U beam and Gammasphere array for ^{208}Pb beam.

 ^{182}Hf Levels

E(level) [†]	J^π [‡]	$T_{1/2}$	Comments
0 [#]	0 ⁺		
98.0 [#] 10	2 ⁺		
323.0 [#] 15	4 ⁺		
667.0 [#] 18	6 ⁺		
1123.0 [#] 20	8 ⁺		
1174.0 [@] 20	8 ⁻	61.5 min 15	$T_{1/2}$: from Adopted Levels. Configuration= $\pi 7/2[404] \otimes \pi 9/2[514]$; $K^\pi=8^-$.
1421.1 [@] 21	(9 ⁻)		
1692.9 [@] 21	(10 ⁻)		
1989.4 [@] 22	(11 ⁻)		
2308.1 [@] 22	(12 ⁻)		
2572.1 25	(13 ⁺)	40 μs 10	$T_{1/2}$: from $\gamma(t)$ (1999Da09). Configuration= $((\nu 11/2[615] \otimes \nu 1/2[510])_{5-})(\pi_{8-}^2)$; $K^\pi=(13^+)$.

[†] From least-squares fit to E_γ data; $\Delta(E_\gamma)=1$ keV assumed for each transition.

[‡] As given by 1999Da09, based on (13⁺) assignment for the 40- μs isomer. The assignments in Adopted Levels are the same except that all assignments above 100-keV level are in parentheses there due to lack of strong arguments.

[#] Band(A): g.s. band.

[@] Band(B): 8⁻ band.

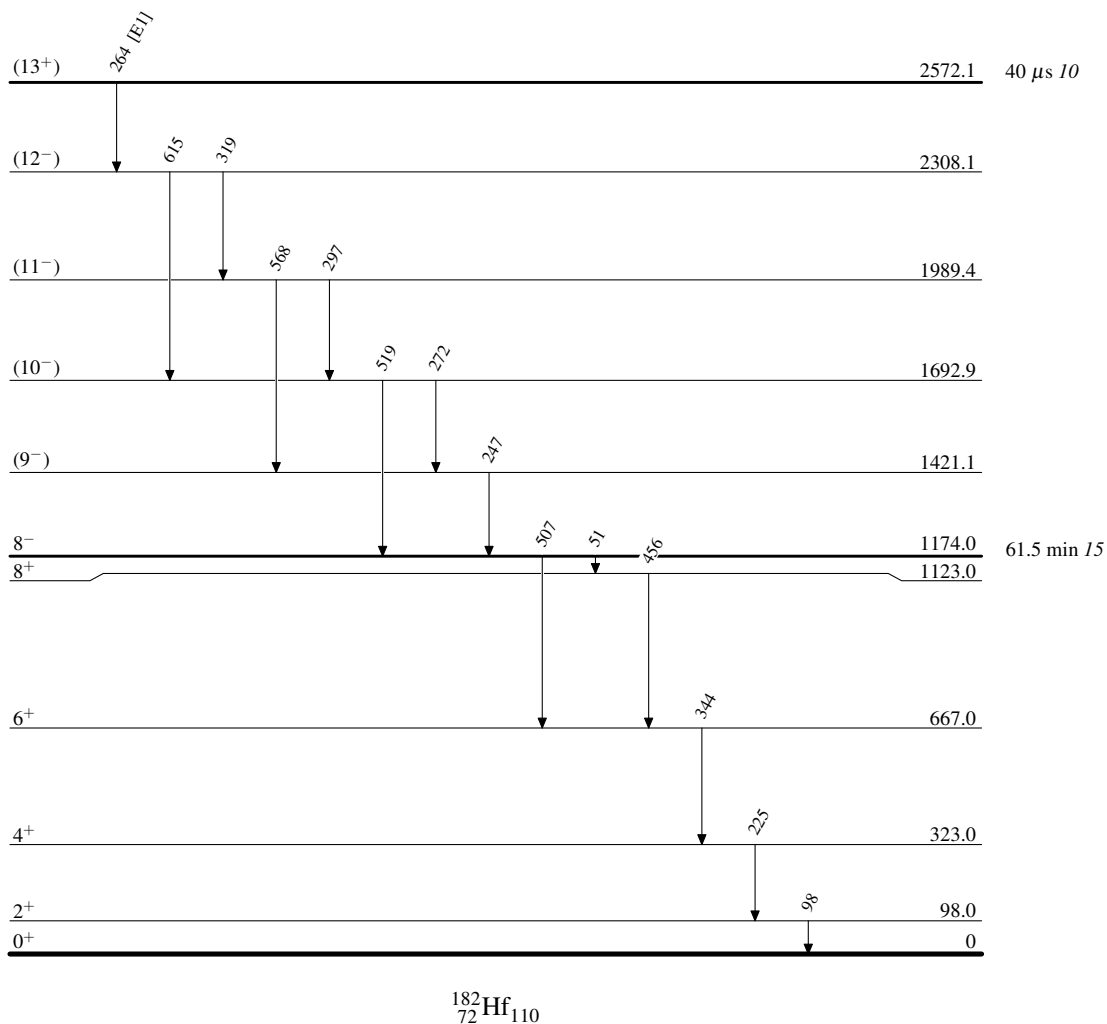
 $\gamma(^{182}\text{Hf})$

γ rays from ^{182}Hf were identified from coincidences between ^{182}Hf γ rays and ^{236}U γ rays (260-303-341-375 cascade in ^{236}U).

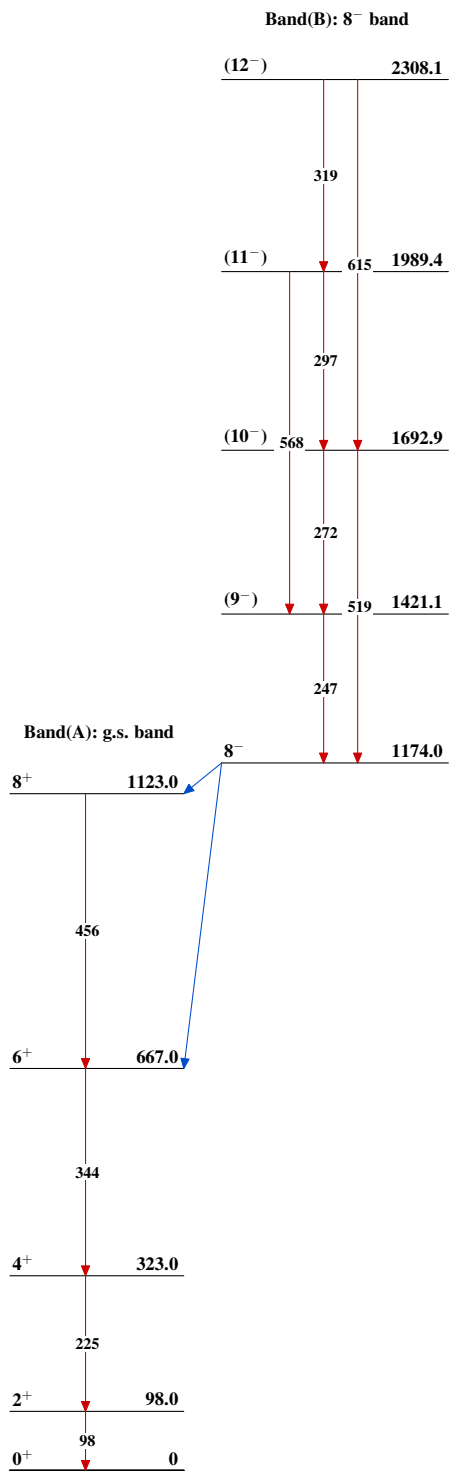
E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
51	1174.0	8 ⁻	1123.0	8 ⁺		319	2308.1	(12 ⁻)	1989.4	(11 ⁻)
98	98.0	2 ⁺	0	0 ⁺		344	667.0	6 ⁺	323.0	4 ⁺
225	323.0	4 ⁺	98.0	2 ⁺		456	1123.0	8 ⁺	667.0	6 ⁺
247	1421.1	(9 ⁻)	1174.0	8 ⁻		507	1174.0	8 ⁻	667.0	6 ⁺
264	2572.1	(13 ⁺)	2308.1	(12 ⁻)	[E1] [†]	519	1692.9	(10 ⁻)	1174.0	8 ⁻
272	1692.9	(10 ⁻)	1421.1	(9 ⁻)		568	1989.4	(11 ⁻)	1421.1	(9 ⁻)
297	1989.4	(11 ⁻)	1692.9	(10 ⁻)		615	2308.1	(12 ⁻)	1692.9	(10 ⁻)

[†] Weisskopf estimate supports E1.

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Level Scheme


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$^{182}_{72}\text{Hf}_{110}$