^{178}Hf(d,2nγ) 1979Du02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Achterberg, O. A. Capurro, G. V. Marti	NDS 110, 1473 (2009)	31-May-2008

1979Du02: ^{178}Hf(d,2nγ), E(d)=13.5 MeV. Target 98% enriched. Measured Eγ, Iγ, γγ coin, E(ce), Ice. Detectors: Ge(Li), scin, Si(Li).

^{178}Ta Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0+x#	7⁻	392.8+x[a] *15*	(9⁻)	567.3+x[a] *18*	(10⁻)	857.0+x& *20*	(9⁻)
198.3+x# *10*	8⁻	418.4+x# *15*	(9⁻)	645.3+x@ *18*	(10⁺)	886.2+x@ *20*	(11⁺)
220.1+x@ *10*	(8)⁺	422.9+x@ *15*	(9)⁺	648.8+x& *18*	(8⁻)	993.9+x[a] *23*	(12⁻)
289.5+x& *10*	6⁻	459.4+x& *15*	(7⁻)	768.2+x[a] *20*	(11⁻)		

† From least-squares adjustment to γ energies.
‡ From γ-ray multipolarities derived from ce data, from αγ(θ) in ^{176}Lu(α,2nγ), and from rotational band structure (1979Du02).
# Band(A): $K^\pi=7^-$ rotational band possible configuration=π7/2[404] + ν7/2[514].
@ Band(B): $K^\pi=(8)^+$ rotational band possible configuration=π9/2[514] + ν7/2[514].
& Band(C): $K^\pi=6^-$ rotational band possible configuration=π5/2[402] + ν7/2[514].
[a] Band(D): $K^\pi=9^-$ rotational band possible configuration=π9/2[514] + ν9/2[624].

γ(^{178}Ta)

Eγ†	Iγ‡	Ei(level)	Jiπ	Ef	Jfπ	Mult.@	α&	Comments
x46.0	30							
x71.9	15							
x72.9	34							
x83.5	41							
x86.0	3.4							
x97.0	5.2							
x98.4	13							
x105.4	5.7							
x115.7	21							
x116.5	3							
x118.5	8							
x122.2	23							
x127.4	10							
x129.4	100					E1	0.188	Mult.: from α(K)exp=0.030 *8*.
x136.3	3.5							
x143.7	2.5							
x161.1	6.9#							
169.9	36#	459.4+x	(7⁻)	289.5+x	6⁻			
174.5	2	567.3+x	(10⁻)	392.8+x	(9⁻)			
x178.9	6.9							
189.4	3	648.8+x	(8⁻)	459.4+x	(7⁻)			
x190.9	3.7							
x193.4	6.2							
194.5	7.4	392.8+x	(9⁻)	198.3+x	8⁻			
198.3	18	198.3+x	8⁻	0.0+x	7⁻	M1+E2	0.47 *16*	Mult.: from α(K)exp=0.25 *7*.
200.9	1	768.2+x	(11⁻)	567.3+x	(10⁻)			
202.8	7.9	422.9+x	(9)⁺	220.1+x	(8)⁺			
x204.9	2.8							

Continued on next page (footnotes at end of table)

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$\gamma(^{178}Ta)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	α[&]	Comments
208.2	2.8	857.0+x	(9^-)	648.8+x	(8^-)			
220.1[a]	36[a]	220.1+x	$(8)^+$	0.0+x	7^-	E1	0.0476	B(E1)(W.u.)=2.3×10^{-6} *3* Mult.: from α(K)exp=0.041 *10*.
220.1[a]	1.4[a]	418.4+x	(9^-)	198.3+x	8^-			
222.4	6	645.3+x	(10^+)	422.9+x	$(9)^+$			
225.7	1	993.9+x	(12^-)	768.2+x	(11^-)			
[x]235.5	1.7							
240.9	2.2	886.2+x	(11^+)	645.3+x	(10^+)			
[x]266.1	7.9							
[x]273.4	2.9							
289.5	35	289.5+x	6^-	0.0+x	7^-	M1	0.222	B(M1)(W.u.)=0.00037 *10* Mult.: from α(K)exp=0.18 *5*.
[x]298.7	4.8							
[x]320.3	1.5							
[x]329.5	45							
[x]362.3	4					M1+E2	0.08 *4*	Mult.: from α(K)exp=0.058 *15*.

[†] Uncertainties are 0.1 to 0.3 keV depending on Iγ and on the complexity of the spectrum.
[‡] Measured at θ=125°. Uncertainties are 10 to 30% depending on Iγ.
[#] Contains contribution from impurities.
[@] From measured conversion coefficients. Iγ and Ice intensity scales normalized to each other using the 304.2 keV M1 γ ray in the ^{179}Hf contaminant.
[&] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[a] Multiply placed with intensity suitably divided.
[x] γ ray not placed in level scheme.

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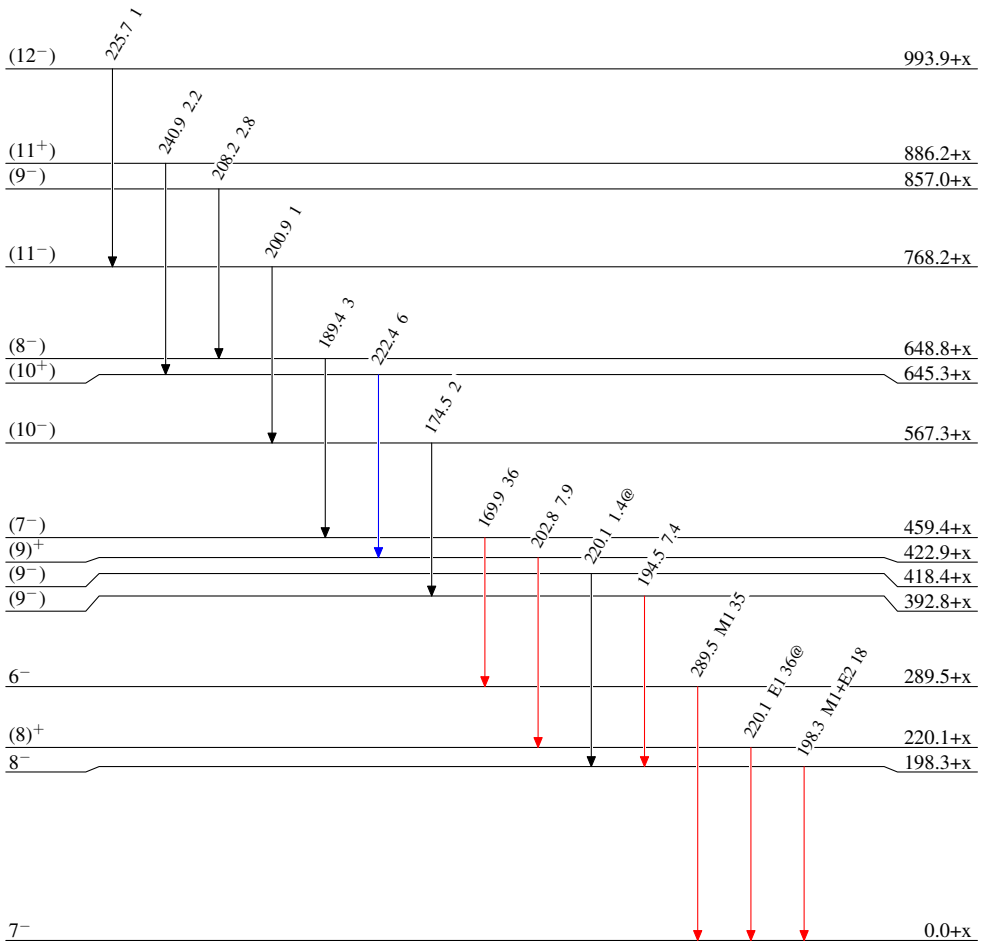
Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{178}_{73}Ta_{105}$

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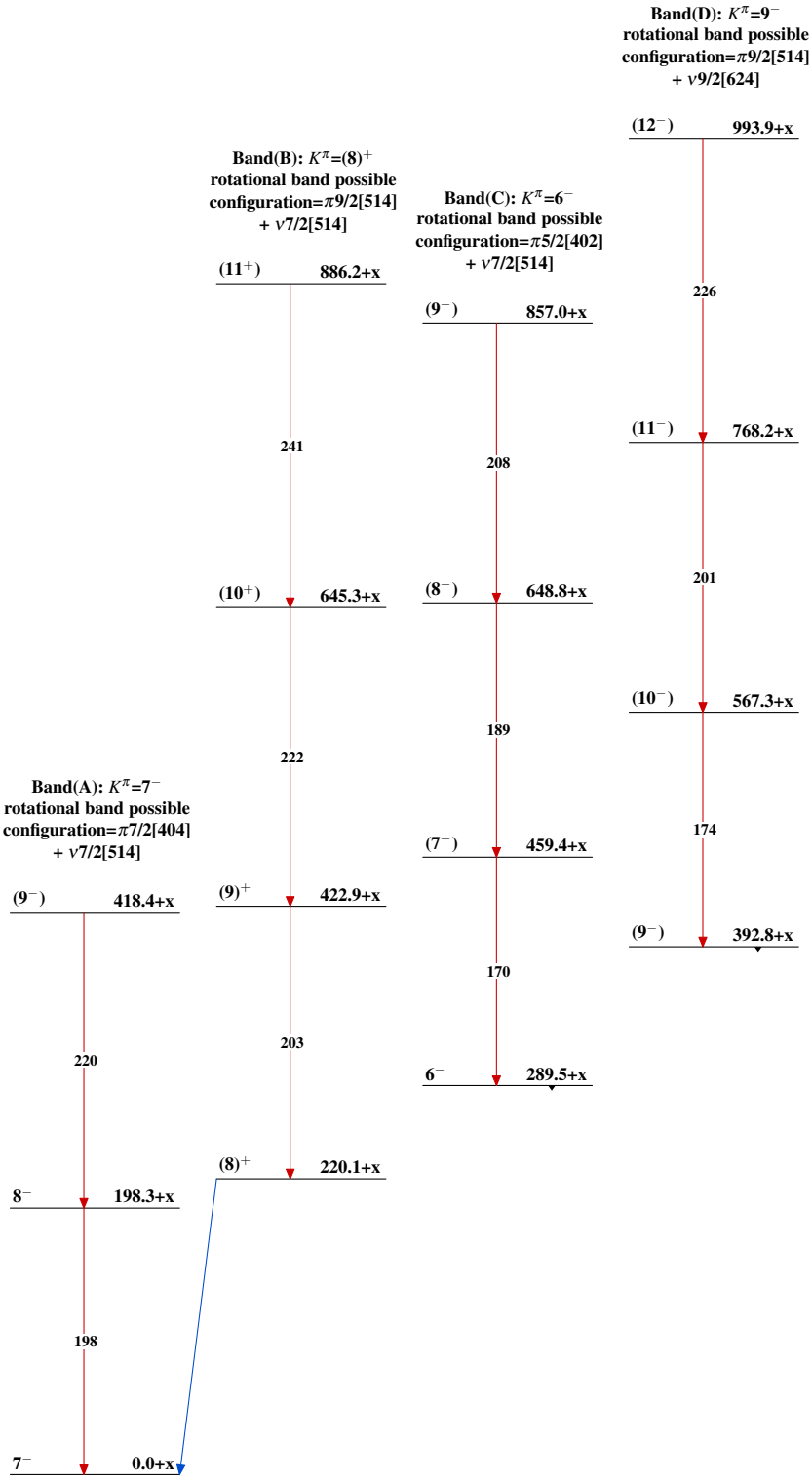

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