^{166}Er(pol t,α),(t,α) 1978Lo08,1975Wa12

History

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

1978Lo08: (pol t,α) E=17 MeV. Measured σ(Eα,θ), analyzing powers, magnetic spectrograph and position sensitive proportional counter, FWHM≈16 keV. DWBA analysis.
1975Wa12: (t,α) E=27 MeV. Measured σ(E(α)), FWHM≈19 keV, magnetic spectrograph and photographic plates.

^{165}Ho Levels

NSF=Nuclear Structure Factor=[dσ/dΩ(exp)]/[2N((dσ/dΩ)(DWBA))], N=23. Theoretically NSF=$[\Sigma_i C^i_{jl} a_i V_i]^2$, with C^i_{jl}=coefficients to describe Nilsson orbitals in terms of spherical states, a_i=Coriolis mixing amplitudes of states with same spin, V_i=fullness factors for the target. The Nuclear Structure Factors are listed under comments; for calculated values, see table 1 (listing all experimental data and relevant calculations) of 1978Lo08. Note that Nuclear Structure factors given in 1975Wa12 are too small by a factor of (L+1)/3, as stated by 1978Lo08 and values as quoted from 1975Wa12 under comments have been corrected by 1978Lo08, as listed in Table 1.
Band assignments are from 1975Wa12.

E(level)[†]	Jπ[‡]	L[b]	dσ/dΩ (μb/sr)[&]	Comments
0[c]	7/2⁻	3	11	NSF=0.041 (1978Lo08), 0.018 (1975Wa12). Ay(θ)(30°)=+0.32 *13*.
96[c] *2*	9/2⁻	5	12	NSF=0.11 (1978Lo08), 0.045 (1975Wa12). Ay(θ)(30°)=−0.63 *11*.
212[c] *2*	11/2⁻	5	205	NSF=1.42(1978Lo08), 1.40 (1975Wa12). Ay(θ)(30°)=+0.57 *3*.
≈345[#c]	(13/2⁻)		<2.6[a]	
362[d] *2*	3/2⁺	2	21	NSF=0.059(1978Lo08), 0.066 (1975Wa12). Ay(θ)(30°)=−0.66 *8*.
421[d] *2*	5/2⁺	2	262	NSF=0.75(1978Lo08), 0.76 (1975Wa12). Ay(θ)(30°)=+0.46 *3*.
452[f] *2*	3/2⁺	2	69	NSF=0.20(1978Lo08), 0.29 (1975Wa12). Ay(θ)(30°)=−0.62 *4*.
497[@d] *2*	(7/2)⁺&(15/2⁻)		23	E(level),Jπ: unresolved doublet of 491+499 levels seen in γ-ray studies, with the two components belonging to π3/2[411] and π7/2[523] band, respectively. Ay(θ)(30°)=+0.09 *9*.
538[f] *2*	5/2⁺	2	9	NSF=0.023(1978Lo08), 0.030 (1975Wa12). Ay(θ)(30°)=+0.05 *15*.
596[@f] *2*	7/2⁺&9/2⁺	4	15	E(level): correspond to 590+604 in 1975Wa12. NSF≈0.24(1978Lo08), 0.074 for 7/2⁺ at 590, 0.12 for 9/2⁺ at 604 (1975Wa12). Ay(θ)(30°)=0.00 *9*.
604[#d] *1*	(9/2⁺)		13[a]	
640[#] *1*	(7/2⁻)		7[a]	
≈688[#]	(11/2)⁻		4.4[a]	
714[g] *2*	7/2⁺	4	39	NSF=0.26(1978Lo08), 0.23 (1975Wa12). Ay(θ)(30°)=−0.66 *6*.
806[h] *2*	9/2⁻	5	9	NSF=0.044(1978Lo08), 0.058 (1975Wa12). Ay(θ)(30°)=−0.43 *14*.
≈820[#g]	(9/2⁺)		≤5.2[a]	
≈991[#e]	5/2⁺		6.3[a]	NSF=0.012 (1975Wa12).
1056[i] *2*	5/2⁺	2	30	NSF=0.098(1978Lo08), 0.077 (1975Wa12). Ay(θ)(30°)=+0.22 *8*.

Continued on next page (footnotes at end of table)

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^{165}Ho Levels (continued)

E(level)[†]	Jπ[‡]	L[b]	dσ/dΩ (μb/sr)[&]	Comments
1081[e] 2	7/2+	4		NSF=0.74(1978Lo08), 0.69 (1975Wa12). Ay(θ)(30°)=−0.57 4.
1190[e] 2	9/2+	4	14	NSF=0.11(1978Lo08), 0.081 (1975Wa12). Ay(θ)(30°)=+0.15 12.
≈1236[#]			5.8[a]	
1291 5			10	Ay(θ)(30°)=+0.43 13.
1316 5			7	Ay(θ)(30°)=+0.57 14.
1486[j] 5	7/2−	3	58	NSF=0.14(1978Lo08), 0.072 (1975Wa12). Ay(θ)(30°)=+0.37 6.
1550 5			13	Ay(θ)(30°)=−0.55 11.
1590[k] 5	11/2−		13	NSF=0.10. Ay(θ)(30°)=+0.11 12.
≈1649[#]			7[a]	
1674[l] 5	11/2−		136	NSF=1.27(1978Lo08), 0.86 (1975Wa12). Ay(θ)(30°)=+0.45 3.
1720 5			11	Ay(θ)(30°)=+0.27 13.
1762 5	(1/2+)	(0)	98	NSF=0.21. Ay(θ)(30°)=−0.03 5.
1776[#] 5			22[a]	
1835 5	(1/2+)	(0)	85	NSF=0.19. Ay(θ)(30°)=+0.07 5.
1907 5	(11/2)−	5	23	NSF=0.21. Ay(θ)(30°)=+0.41 9.
1939 5	(7/2−)	(3)	32	L: 2 and 4 are not excluded. NSF=(0.15). Ay(θ)(30°)=+0.24 7.
1986[#] 5			10[a]	
2025[#] 5			15[a]	

[†] From 1978Lo08, unless otherwise stated.
[‡] Spins and Nilsson configurations from σ(θ) and analyzing powers (1978Lo08). These assignments are consistent with those in the Adopted Levels. Positive Ay(θ) values indicate J=L(+1/2) assignment and negative Ay(θ) J=L−(1/2) assignment.
[#] Observed only in 1975Wa12,
[@] Possible doublet.
[&] At 30° (1978Lo08). Cross sections are also given by 1975Wa12.
[a] Normalized to 262 for 421 level.
[b] Deduced from DWBA analysis of σ(θ) data (1978Lo08).
[c] Band(A): π7/2[523] band.
[d] Band(B): π3/2[411] band.
[e] Band(C): π5/2[413] band.
[f] Band(D): π1/2[411] band.
[g] Band(E): π7/2[404] band.
[h] Band(F): π1/2[541] band.
[i] Band(G): π5/2[402] band.
[j] Band(H): π5/2[523] band.
[k] Band(I): π9/2[514] band.
[l] Band(J): π5/2[532] band.

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Band(C): π5/2[413] band

9/2$^+$	1190
7/2$^+$	1081
5/2$^+$	≈991

Band(E): π7/2[404] band

(9/2$^+$)	≈820
7/2$^+$	714

Band(B): π3/2[411] band

(9/2$^+$)	604
(7/2)$^+$&(15/2$^-$)	497
5/2$^+$	421
3/2$^+$	362

Band(D): π1/2[411] band

7/2$^+$&9/2$^+$	596
5/2$^+$	538
3/2$^+$	452

Band(A): π7/2[523] band

(7/2)$^+$&(15/2$^-$)	497
(13/2$^-$)	≈345
11/2$^-$	212
9/2$^-$	96
7/2$^-$	0

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Band(J): π5/2[532] band

11/2$^-$	**1674**

Band(I): π9/2[514] band

11/2$^-$	**1590**

Band(H): π5/2[523] band

7/2$^-$	**1486**

Band(G): π5/2[402] band

5/2$^+$	**1056**

Band(F): π1/2[541] band

9/2$^-$	**806**

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