

$^{167}\text{Er}(\text{d,t},(^3\text{He},\alpha)$ **1979Pa15**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 1103 (2008)	1-Mar-2008

Target $J^\pi=7/2^+$.

1979Pa15: E(d)=15 MeV (FWHM=7-8 keV) and E(^3He)=24 MeV (FWHM \approx 21 keV); magnetic spectrograph, photographic emulsions; measured $d\sigma/d\Omega$.

Other measurement: **1969Bu01**.

^{166}Er Levels

J(K),L(K) Angular distributions in the (d,t) reaction have large cross sections at forward angles indicative of L=0 neutron transfers.

E(level)	J^π^\dagger	L	$d\sigma/d\Omega(\text{d,t})^\ddagger$	Comments
79#	2 ⁺		17.3	$d\sigma/d\Omega(50^\circ) < 1.0 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
265#	4 ⁺	≈ 39		$d\sigma/d\Omega(50^\circ) = 6.5 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
545#	6 ⁺	24		$d\sigma/d\Omega(50^\circ) = 17.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
786@	2 ⁺		5.6	
859@	3 ⁺		5.6	
911#	8 ⁺		8.2	$d\sigma/d\Omega(50^\circ) = 6.0 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
957@	4 ⁺		5.8	
1075@	5 ⁺		4.1	
1215@	6 ⁺		2.3	
1375@	7 ⁺		<1.0	
1458&	(2 ⁻)	103		$d\sigma/d\Omega(50^\circ) < 1.0 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1515&	(3 ⁻)	72		$d\sigma/d\Omega(50^\circ) = 2.1 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1572&	4 ⁻		5.0	
1597	(4 ⁻)		46	$d\sigma/d\Omega(50^\circ) = 1.9 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1666	5 ⁻		14.8	
1679			4.7	$d\sigma/d\Omega(50^\circ) = 1.9 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1692	(5 ⁻)		12.4	
1700			4.2	$d\sigma/d\Omega(50^\circ) = 2.0 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1722			7.0	
1762			10.9	$d\sigma/d\Omega(50^\circ) = 2.1 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1787	6 ⁻		3.5	
1813			3.4	
1829	(6 ⁻)		9.9	
1865			33	$d\sigma/d\Omega(50^\circ) = 15.5 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1896			11.3	
1910 ^a	(6 ⁻)		47	$d\sigma/d\Omega(50^\circ) = 5.3 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1940	(3,4) ⁺	0	38	$d\sigma/d\Omega(50^\circ) < 1.0 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1970			11.8	$d\sigma/d\Omega(50^\circ) = 2.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
1979	(3,4) ⁺	0	26	
1987			15.9	
2003			2.2	
2022 ^b	(4 ⁻)		96	$d\sigma/d\Omega(50^\circ) = 8.0 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2032	(5 ⁺)		29	$d\sigma/d\Omega(50^\circ) = 12.7 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2050 ^a	(7 ⁻)		22	$d\sigma/d\Omega(50^\circ) = 8.8 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2061			28	$d\sigma/d\Omega(50^\circ) = 4.7 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2080 ^c	(3 ⁻)		88	peak obscured in ($^3\text{He},\alpha$) (1979Pa15).
2090	(6 ⁺)		10.3	$d\sigma/d\Omega(50^\circ) = 11.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).

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$^{167}\text{Er}(\text{d,t}),(^3\text{He},\alpha)$ **1979Pa15** (continued) ^{166}Er Levels (continued)

E(level)	J^π [†]	L	$d\sigma/d\Omega(\text{d,t})$ [‡]	Comments
2122 ^b	(5 ⁻)		28	$d\sigma/d\Omega(50^\circ)=18.1 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2128			190	
2147 ^c	(4 ⁻)		33	$d\sigma/d\Omega(50^\circ)=11.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2161	(3,4) ⁺	0	38	
2174			14.3	$d\sigma/d\Omega(50^\circ)=13.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2182			3.4	$d\sigma/d\Omega(50^\circ)=5.4 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2215	(3 ⁻)		86	$d\sigma/d\Omega(50^\circ)=12.5 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2242 ^d	(5 ⁻)		143	$d\sigma/d\Omega(50^\circ)=30 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2266			12.4	$d\sigma/d\Omega(50^\circ)=16.7 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2274			13.8	
2295	(3,4) ⁺	0	289	$d\sigma/d\Omega(50^\circ)=7.1 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2316	(3,4) ⁺	0	277	$d\sigma/d\Omega(50^\circ)=9.8 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2336			243	$d\sigma/d\Omega(50^\circ)=11.1 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2353			75	
2367 ^d	(6 ⁻)		115	$d\sigma/d\Omega(50^\circ)=10.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2377			81	$d\sigma/d\Omega(50^\circ)=23 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2386	(3,4) ⁺	0	73	
2402			49	$d\sigma/d\Omega(50^\circ)=7.6 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2417			37	$d\sigma/d\Omega(50^\circ)=4.9 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2427			98	
2438	(3,4) ⁺	0	≈28	
2449			83	$d\sigma/d\Omega(50^\circ)=6.8 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2478			58	$d\sigma/d\Omega(50^\circ)=2.9 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2495	(9 ⁻)		57	$d\sigma/d\Omega(50^\circ)=34 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2499	(3,4) ⁺	0	94	
2512	(3,4) ⁺	0	237	$d\sigma/d\Omega(50^\circ)=18.7 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2522			≈28	
2534				$d\sigma/d\Omega(50^\circ)=7.8 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2545			41	
2563			26	$d\sigma/d\Omega(50^\circ)=5.2 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2578			8.8	
2586	(3,4) ⁺	0	76	$d\sigma/d\Omega(50^\circ)=7.3 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2603			30	
2622			21	
2631	(3,4) ⁺	0	388	$d\sigma/d\Omega(50^\circ)=5.3 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2649			11.4	$d\sigma/d\Omega(50^\circ)=2.7 \mu\text{b/sr}$ for ($^3\text{He},\alpha$) (1979Pa15).
2670			2.7	
2677			19.1	
2687			≈20	
2734	(3,4) ⁺	0	48	

[†] Assignments based on (d,t) and ($^3\text{He},\alpha$) cross section.

[‡] $d\sigma/d\Omega(45^\circ)$ in $\mu\text{b/sr}$ for (d,t) reaction (1979Pa15).

Band(A): $K^\pi=0^+$ g.s. band. Configuration: $7/2[633]-7/2[633]$.

@ Band(B): $K^\pi=2^+$ γ -vibrational band.

& Band(C): $K^\pi=2^-$ band. Configuration: $7/2[633]-3/2[521]$ mixed with $7/2[523]+1/2[411]$ for $J \geq 4$.

^a Band(D): $K^\pi=(6^-)$ band. Configuration: $7/2[633]+5/2[523]$.

^b Band(E): $K^\pi=(4^-)$ band. Configuration: $7/2[633]+1/2[521]$.

^c Band(F): $K^\pi=(3^-)$ band. Configuration: $7/2[633]-1/2[521]$.

^d Band(G): $K^\pi=(5^-)$ band. Configuration: $7/2[633]+3/2[521]$.

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		Band(E): $K^\pi=(4^-)$ band	Band(F): $K^\pi=(3^-)$ band
		(5 ⁻)	(4 ⁻)
		2122	2147
	Band(D): $K^\pi=(6^-)$ band		(3 ⁻)
	(7 ⁻)		2080
	2050	(4 ⁻)	2022
	(6 ⁻)		
	1910		
	Band(C): $K^\pi=2^-$ band		
	4 ⁻		
	1572		
	(3 ⁻)		
	1515		
	(2 ⁻)		
	1458		
	Band(B): $K^\pi=2^+$ γ -vibrational band		
	7 ⁺		
	1375		
	6 ⁺		
	1215		
	5 ⁺		
	1075		
	Band(A): $K^\pi=0^+$ g.s. band		
	4 ⁺		
	957		
	8 ⁺		
	911		
	3 ⁺		
	859		
	2 ⁺		
	786		
	6 ⁺		
	545		
	4 ⁺		
	265		
	2 ⁺		
	79		

$^{167}\text{Er}(\text{d,t}),(^3\text{He},\alpha)$ 1979Pa15 (continued)

Band(G): $\text{K}^\pi=(5^-)$ band

(6⁻) 2367

(5⁻) 2242

$^{166}_{68}\text{Er}_{98}$
