^{242}Pu(d,p), ^{244}Pu(d,t) 1976Ca25,1972Br46,1965Br22

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 121, 695 (2014)	30-Sep-2013

Q(d,p)=2807 *8* (1972Br46).
Q(d,t)=234 *5* (1976Ca25).
1976Ca25: 12 MeV deuteron beam from Argonne FN Tandem Van de Graaff accelerator bombarded ^{242}Pu (≈90 μg/cm^2) and ^{244}Pu (≈35 μg/cm^2) targets. The proton and deuteron spectra were measured at θ=90° and 150° for the (d,p) reaction (FWHM=13 keV) and at θ=90°, 120° and 150° for the (d,t) reaction (FWHM=10 keV).
For earlier data, see: 1965Br22, 1967Er02 and 1972Br46.

^{243}Pu Levels

E(level)†	Jπ‡	Comments
0.0#	7/2+	
55.6# *15*	9/2+	
123.7# *15*	11/2+	
204.4# *15*	13/2+	
287.7@ *15*	5/2+	
330.9@ *15*	7/2+	
388& *3*	1/2+ & 3/2+	E(1/2+)=383.6, E(3/2+)=392.3 from (n,γ) work.
388@ *3*	9/2+	Peak assumed triplet.
450.1& *15*	7/2+	
466.7@ *15*	11/2+	
536.6@ *15*	13/2+	
564.5& *15*	9/2+	
595.3a *15*	(15/2−)	
625.6b	1/2+	E(level): from (n,γ) work.
626c *2*	(9/2+)	1/2+,1/2[620] and 9/2+,7/2[613] states were unresolved.
651b *2*	3/2+	
676.3b *15*	5/2+	
704.5j *15*		
734.1 *20*		
741.8b *15*	7/2+	
790.4d *15*	(3/2−)	
811.6e *15*	(3/2+)	
834.4d *15*	(7/2−)	
849.2e *15*	(5/2+)	
874.2d *15*	(1/2−)	
884 *3*		
895.6e *15*	(7/2+)	
905.1f *15*	1/2−	
920.6d *15*	(11/2−)	
948.8f *15*	3/2−,5/2−	
954e *2*	(9/2+)	
982g *2*	(5/2+)	
1044h *2*	(11/2+)	
1080g *2*	(9/2+)	
1114 *3*		
1131 *2*		

Continued on next page (footnotes at end of table)

^{242}Pu(d,p), ^{244}Pu(d,t) 1976Ca25,1972Br46,1965Br22 (continued)

^{243}Pu Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	E(level)[†]	E(level)[†]
1145 *3*		1243 *3*	1354 *2*	1444 *3*
1178 *2*		1265 *3*	1359 *3*	1465 *3*
1197 *3*		1286 *3*	1389 *2*	1492 *2*
1216[i] *2*	(5/2⁻)	1299 *2*	1403 *3*	
1233 *3*		1324 *2*	1419 *3*	

[†] Measurements of 1976Ca25. See also 1965Br22 and 1972Br46.
[‡] Assignments of 1976Ca25, 1972Br46 and 1965Br22 are based on ratios of cross sections at 90° and 150°; on ratios of (d,p) to (d,t) cross sections (the ratio can distinguish between particle and hole states as well as collective states); on comparison of relative cross sections with those expected 'signatures' for various band members; on information obtained from (n,γ) data; and on systematics of Nilsson orbitals.
[#] Band(A): 7/2[624] band member.
[@] Band(B): 5/2[622] band member.
[&] Band(C): 1/2[631] band member.
[a] Band(D): 9/2[734] band member?
[b] Band(E): 1/2[620] band member.
[c] Band(F): 7/2[613] band member.
[d] Band(G): 1/2[761] band member. This band is labeled by 1976Ca25 as the 1/2[750] band, since the single-particle wavefunction is calculated to have more λ=0 than λ=1 base vector. We use here the label 1/2[761], in accordance with the conventional labeling of Nilsson states in the order of their energies.
[e] Band(H): 3/2[622] band member.
[f] Band(I): 1/2[501] band member.
[g] Band(J): 3/2[631] band member.
[h] Band(K): 9/2[615] band member?
[i] Band(L): 5/2[503] band member?
[j] Band(M): K=3/2 octupole-vibrational band member, built either on the 7/2[624] or the 5/2[622] state.

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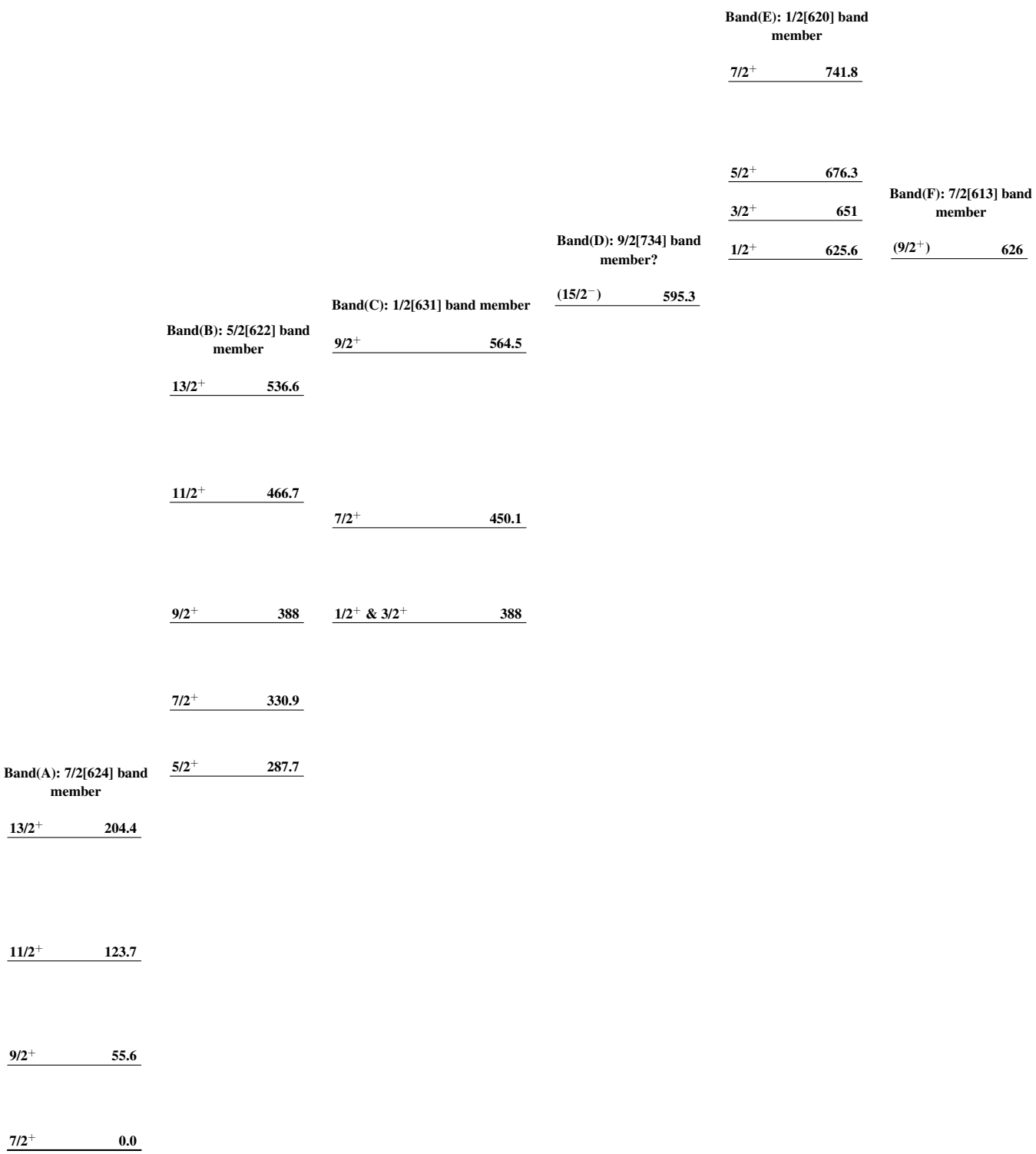

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^{242}Pu(d,p), ^{244}Pu(d,t) 1976Ca25,1972Br46,1965Br22 (continued)

Band(L): 5/2[503] band member?

(5/2$^-$) 1216

Band(J): 3/2[631] band member

(9/2$^+$) 1080

Band(K): 9/2[615] band member?

(11/2$^+$) 1044

(5/2$^+$) 982

Band(H): 3/2[622] band member

(9/2$^+$) 954

Band(I): 1/2[501] band member

3/2$^-$,5/2$^-$ 948.8

Band(G): 1/2[761] band member

(11/2$^-$) 920.6

1/2$^-$ 905.1

(7/2$^+$) 895.6

(1/2$^-$) 874.2

(5/2$^+$) 849.2

(7/2$^-$) 834.4

(3/2$^+$) 811.6

(3/2$^-$) 790.4

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Band(M): K=3/2 octupole-vibrational band member, built either on the 7/2[624] or the 5/2[622] state
704.5

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