^{232}Th(^{3}He,d),(α,t) 1975El03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	B. Singh, J. K. Tuli, E. Browne	NDS 170, 499 (2020)	8-Oct-2020

1975El03: (^{3}He,d),E(d)=28.5 MeV and (α,t),E(α)=30 MeV beams from the University of Rochester Emperor Tandem accelerator. The spectra of deuterons and tritons recorded with an Enge split-pole magnetic spectrometer. Deuterons were detected at 60° with FWHM=18 keV, and tritons at 45° with FWHM=16 keV. DWBA analysis.

2014Gu04, 2013Gu10, 2012Gu21: E(^{3}He)=24 MeV, measured continuum γ rays, (particle)γ-coin using CACTUS γ-detector array at Oslo cyclotron facility.; deduced γ-strength functions and M1 scissors resonances.

^{233}Pa Levels

R=[dσ/dΩ(α,t)]/[dσ/dΩ(^{3}He,d)], measured cross sections.

E(level)	J$^{\pi}$[†]	L[‡]	dσ/dΩ (μb/sr)[#]	Comments
0[&]	3/2^{-}	(1)	9.0 *9*	dσ/dΩ(α,t)=10.0 μb/sr *25*. R=1.1 *3*.
57[&] *1*	7/2^{-}	(3)	8.6 *9*	dσ/dΩ(α,t)=24.0 μb/sr *20*. R=2.8 *4*.
107[a] *2*	7/2^{+}&9/2^{+}	(4)	4.7 *6*	dσ/dΩ(α,t)=10.8 μb/sr *19*. R=2.3 *5*.
173[a] *1*	13/2^{+}	(6)	16.6 *12*	dσ/dΩ(α,t)=53 μb/sr *6*. R=3.2 *4*.
298[bc] *3*	7/2^{+}&(7/2^{-})	(4+3)	1.6 *4*	dσ/dΩ(α,t)=4.2 μb/sr *7*. R=2.6 *8*.
355[b] *2*	(9/2^{-})	(5)	6.3 *8*	dσ/dΩ(α,t)=22.5 μb/sr *24*. R=3.6 *6*.
421?[b] *4*	(11/2^{-})	(5)	0.4 *2*	dσ/dΩ(α,t)=(1.3 μb/sr *4*). R=3.3 *19*.
450 *2*			3.3 *6*	dσ/dΩ(α,t)=6.3 μb/sr *17*.
529 *2*	(13/2^{+})	(6)	3.6 *6*	dσ/dΩ(α,t)=9.1 μb/sr *7*. R=2.5 *5*. Probable 1/2[660] state.
589[c] *4*	(13/2^{+})	(6)	0.4 *2*	dσ/dΩ(α,t)=1.3 μb/sr *4*. R=3.3 *19*.
670[@] *3*	3/2^{-}	(1)	2.6 *5*	dσ/dΩ(α,t)=(1.3 μb/sr *3*). R=0.5 *2*.
704[@] *3*	5/2^{-}	(3)	1.5 *4*	dσ/dΩ(α,t)=2.6 μb/sr *4*. R=1.7 *5*.
749[@] *1*	7/2^{-}	(3)	21.7 *15*	dσ/dΩ(α,t)=29.2 μb/sr *24*. R=1.3 *2*.
803?[@] *4*	9/2^{-}	(5)	0.9 *3*	dσ/dΩ(α,t)=1.6 μb/sr *4*. R=1.8 *7*.
852 *4*			1.8 *4*	
871[@] *2*	11/2^{-}	(5)	3.0 *4*	dσ/dΩ(α,t)=6.5 μb/sr *11*. R=2.2 *5*.
990 *4*			1.8 *4*	
1143 *3*			4.4 *6*	
1179 *3*			4.1 *6*	
1240 *3*			2.7 *5*	
1274? *5*			0.9 *3*	
1318 *4*			1.5 *4*	
1358 *4*			1.2 *3*	
1403 *3*			3.5 *6*	

[†] From comparison of measured and calculated cross sections for different band members (fingerprint method).
[‡] From (^{3}He,d) and (α,t) cross section ratios, the values are expected to be within one unit of angular momentum.
[#] For (^{3}He,d) at 60°. the (α,t) cross sections at 45° are given under comments. see 1975El03 for calculated dσ(α,t)/dσ(^{3}He,d) ratios and calculated differential cross sections in both reactions for band members (up to 11/2^{-} for negative parity states and 13/2^{+} for positive parity states) of 1/2[530], 5/2[523], 3/2[521], 3/2[651], 1/2[660] and 5/2[642] configurations.
[@] Member of π3/2[521] configuration.
[&] Member of π1/2[530] configuration.
[a] Member of π3/2[651] configuration.
[b] Member of π5/2[523] configuration.
[c] Probable member of π5/2[642] configuration.