$^{232}Th(^3He,\alpha)$ 1969El03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jagdish K. Tuli, and Edgardo Browne	NDS 185, 560 (2022)	31-Aug-2022

1969El03: E(^{3}He)=30 MeV, Measured α spectra at 20°, 25°, 35°, 60° and 90° using an Enge split-pole magnetic spectrograph at the tandem Van de Graaff accelerator of the University of Rochester. Deduced spectroscopic factors. DWBA analysis.

Others:

2012Wi03: $^{232}Th(^3He,\alpha\gamma)$,E(^{3}He)=12,24 MeV. Measured γ-ray spectra, $\alpha\gamma$-coin using the CACTUS spectrometer, a 4π array of 28 high-efficiency lead-collimated NaI(Tl) detectors, and light charged particles using the Silicon Ring detector array. Deduced decay probabilities using the weighting function technique, and neutron capture cross sections using surrogate method.

2014Gu04, 2012Gu21 (also 2013Gu10): E=24 MeV. Measured Eγ, Iγ, particle spectra, (particle)γ-coin using SiRi particle telescope and CACTUS γ-detector array at Oslo cyclotron facility. Deduced γ strength functions in the quasicontinuum, low-energy M1 scissors resonance, and nuclear level densities using Oslo method.

2009Go28: E=42 MeV. Measured particle spectra.

^{231}Th Levels

Consult Table 1 in 1969El03 for experimental cross sections at 20°, 25° and 90°.

E(level)	J$^\pi$[#]	L[@]	S	Comments
35[&] *8*	7/2$^+$	3,4,5,6,7	0.13	dσ/dΩ=1.1 μb/sr *6* (35°), 1.3 μb/sr *6* (60°).
100[†&] *2*	9/2$^+$		0.18	dσ/dΩ=2.4 μb/sr *6* (60°).
163[†&] *2*	11/2$^+$	6,7	1.29	dσ/dΩ=20.4 μb/sr *23* (35°), 13.7 μb/sr *13* (60°).
≈225?[&]	(13/2$^+$)		0.10	dσ/dΩ=1.3 μb/sr *8* (60°).
240[b] *8*	(9/2$^+$)	3,4,5,6	0.37	dσ/dΩ=1.7 μb/sr *4* (35°), 5.1 μb/sr *13* (60°).
284[a] *4*	(11/2$^-$)	(5,6)	0.94	S: for ν5/2[752] + ν3/2[761] + ν7/2[743]. dσ/dΩ=3.9 μb/sr *19* (35°), 4.1 μb/sr *9* (60°).
326[†b] *1*	(11/2$^+$)	5,6	1.07	dσ/dΩ=24.0 μb/sr *19* (35°), 24.2 μb/sr *19* (60°).
402[a] *2*	15/2$^-$	7	5.72	S: for ν5/2[752] + ν3/2[761] + ν7/2[743]. dσ/dΩ=90.2 μb/sr *36* (35°), 52.7 μb/sr *27* (60°).
478?[‡] *6*				dσ/dΩ=3.8 μb/sr *8* (35°), 5.8 μb/sr *21* (60°).
579 *3*		4,5,6,7		dσ/dΩ=6 μb/sr *3* (35°), 7.9 μb/sr *13* (60°).
652 *4*				dσ/dΩ=2 μb/sr *1* (35°), 3.2 μb/sr *8* (60°).
752[c] *5*	(15/2$^-$)	5,6,7	5.72	S: for ν5/2[752] + ν3/2[761] + ν7/2[743]. dσ/dΩ=2.9 μb/sr *10* (35°), 2.4 μb/sr *8* (60°).
813 *2*		3,(4)		dσ/dΩ=6.8 μb/sr *11* (35°), 11.6 μb/sr *13* (60°).
871[e] *3*	(7/2$^+$)	4	0.38	dσ/dΩ=5.6 μb/sr *11* (35°), 10.9 μb/sr *19* (60°).
916[e] *2*	(9/2$^+$)	4,5	0.38	dσ/dΩ=10.7 μb/sr *13* (35°), 6.6 μb/sr *19* (60°).
970[e] *4*	(11/2$^+$)		0.18	dσ/dΩ=4.1 μb/sr *11* (35°), 3.9 μb/sr *9* (60°).
1106[‡] *6*		(4)		dσ/dΩ=5.4 μb/sr *9* (35°), 4.5 μb/sr *17* (60°).
1185? *3*				dσ/dΩ=6.2 μb/sr *11* (60°).
≈1332[‡]				dσ/dΩ=17 μb/sr *5* (35°).
1469 *6*				dσ/dΩ=6.8 μb/sr *13* (35°), 5.4 μb/sr *13* (60°).
1574 *3*		≥3		dσ/dΩ=2.8 μb/sr *8* (35°), 6.9 μb/sr *11* (60°).
1675[d] *1*	(15/2$^-$)	6,7	5.72	S: for ν5/2[752] + ν3/2[761] + ν7/2[743]. dσ/dΩ=55.9 μb/sr *30* (35°), 38.3 μb/sr *47* (60°).

† Line used for energy calibration.

‡ Possible doublet.

\# As given in 1969El03, based on Nilsson configuration assignments and comparison between experimental and theoretical spectroscopic factors, and on selected definite L-transfer values.

Continued on next page (footnotes at end of table)

^{232}Th(^{3}He,α) 1969El03 (continued)

^{231}Th Levels (continued)

@ From a comparison between experimental and theoretical (DWBA) angular distributions.
& Band(A): ν5/2[633].
[a] Band(B): ν5/2[752].
[b] Band(C): ν3/2[631].
[c] Band(D): ν7/2[743].
[d] Band(E): (ν3/2[761]).
[e] Band(F): (ν3/2[642]).

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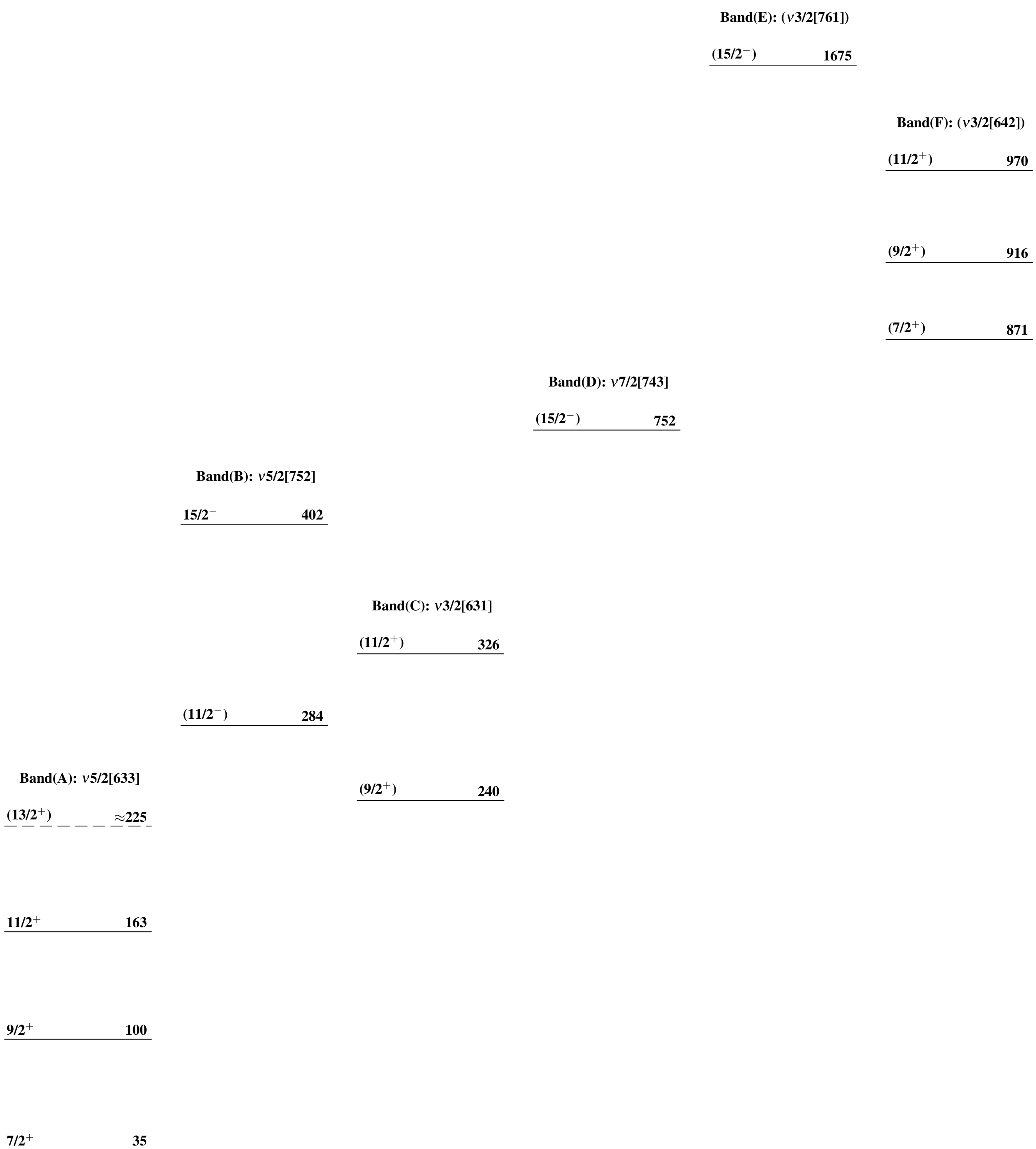

$^{231}_{90}Th_{141}$