^{230}Th(d,t) 2008Bu14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 109, 2657 (2008)	1-Jun-2008

Additional information 1.

E(d)=17 MeV. Measured triton spectra with an Enge split-pole magnetic spectrograph at 19 angles from 5° to 80°. FWHM ≈ 7 keV, 8-10 keV at some angles. DWBA analysis and Nilsson configurations. Coriolis mixing calculations. Other: 1971Er09.

^{229}Th Levels

Additional information 2.

E(level)†	Jπ#	L	S‡	Comments
0.0@	5/2+	2	0.025 *1*	E(level): measured value=0.0 *1*. This group is possibly a doublet: g.s. + 7.6 eV. "Fingerprint" method of cross sections gives some evidence of presence of doublet within a few keV of g.s. dσ/dΩ=32 μb/sr *1* for g.s.+7.6 eV level. L,S: combined for 0+0.0076 levels.
0.0076& *5*	3/2+	2	0.025 *1*	E(level): Possibly forms a doublet with the g.s. 2007Be16 measured a value of 7.6 eV *5*. L,S: combined for 0+0.0076 levels.
29.2&	5/2+	2	0.235 *6*	E(level): energy (rounded value from Adopted Levels) used for calibration purpose. dσ/dΩ=280 μb/sr *9*.
42.5@ *5*	7/2+	4	0.082 *6*	dσ/dΩ=21 μb/sr *3*.
72.0& *2*	7/2+	(4)	≤0.023	dσ/dΩ=7 μb/sr *2*. L: uncertain assignment due to poor L=4 DWBA fit of σ(θ) distribution, which shows larger cross sections at forward angles than predicted.
97.2@ *4*	9/2+	4	0.052 *4*	dσ/dΩ=21 μb/sr *3*.
125.4& *1*	9/2+	4	1.00 *3*	dσ/dΩ=304 μb/sr *10*.
164.0@ *3*	11/2+&3/2−	6+1	0.91 *9*	E(level): doublet, L=1 component is very weak. S: for L=6. s=0.0030 *4* for L=1. dσ/dΩ=34 μb/sr *3*.
202.4a *2*	11/2−	5	0.45 *2*	dσ/dΩ=76 μb/sr *6*.
261.9b *3*	1/2+	0	0.054 *2*	dσ/dΩ=119 μb/sr *6*.
275a *1*	(15/2−)	[7]	1.4 *5*	E(level): 276 *1* in section 4.2 of 2008Bu14. dσ/dΩ=18 μb/sr *5*.
288.4b *3*	3/2+	2	0.129 *4*	dσ/dΩ=138 μb/sr *7*.
317.2b *5*	5/2+	2	0.063 *2*	E(level),Jπ: doublet, mixed configurations. dσ/dΩ=108 μb/sr *5*.
359.6b *5*	(7/2+)	[4]	0.063 *4*	E(level): the 7/2+ member of 5/2[622] configuration may be at 365 keV. L: σ(θ) distribution is shown, but expected L=4 is not conclusive from the DWBA fit. dσ/dΩ=15 μb/sr *2*.
381.4 *4*				dσ/dΩ=6 μb/sr *1*.
424.1 *4*	1/2−,3/2−	1	0.285 *7*	E(level): 1/2[501] and/or 3/2[501] bands. There are several levels known near this energy. The association of most of these levels with 424.1 from (d,t) can be ruled out based on the L assignment in (d,t) data, imcluding possible interpretation of octupole vibration built on 3/2[631] configuration. dσ/dΩ=446 μb/sr *14*.
449.6f *5*	1/2+	0	0.040 *1*	dσ/dΩ=71 μb/sr *4*.
479.1f *5*	3/2+,5/2+	2	0.254 *7*	dσ/dΩ=292 μb/sr *9*.

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^{230}Th(d,t) 2008Bu14 (continued)

^{229}Th Levels (continued)

E(level)[†]	Jπ[#]	L	S[‡]	Comments
535.6[c] *5*	1/2⁻	1	0.636 *16*	dσ/dΩ=1.060 mb/sr *20*.
571.2[c] *6*	(3/2⁻)	1	0.107 *4*	E(level): the 3/2⁻ member of 1/2[501] band is either 571.2 or 586.3. dσ/dΩ=178 μb/sr *7*.
586.3[c] *6*	5/2⁻&(3/2⁻)	1(+3)	0.034 *4*	E(level),Jπ: doublet. The 3/2⁻ member of 1/2[501] band is either 571.2 or 586.3. S: for L=1. S=0.14 *2* for L=3. dσ/dΩ=125 μb/sr *8*.
638.3 *6*		1	0.116 *3*	dσ/dΩ=172 μb/sr *7*.
654.2 *7*		1	0.085 *3*	dσ/dΩ=130 μb/sr *13*.
664.1 *9*		1	0.040 *2*	dσ/dΩ=62 μb/sr *12*.
688.9 *7*		3	0.233 *8*	dσ/dΩ=111 μb/sr *6*.
714.5 *10*				dσ/dΩ=174= μb/sr *2*.
743.4 *12*				dσ/dΩ=20 μb/sr *3*.
778.8[e] *8*	(5/2⁻)	3	0.685 *20*	dσ/dΩ=372 μb/sr *10*.
815.1[d] *8*	(3/2⁻)	1	0.328 *9*	dσ/dΩ=494 μb/sr *15*.
825.1 *10*		3	0.293 *16*	dσ/dΩ=120 μb/sr *20*.
843.4[d] *13*	(5/2⁻)	3	0.043 *4*	Additional information 3. dσ/dΩ=16 μb/sr *5*.
895.2 *9*		1	0.116 *4*	dσ/dΩ=178 μb/sr *7*.
929.1 *10*				dσ/dΩ=20 μb/sr *2*.
972.6 *12*				dσ/dΩ=23 μb/sr *3*.
982.6 *11*		0(+?)	0.015 *1*	dσ/dΩ=50 μb/sr *5*.
1019.0 *11*				dσ/dΩ=26 μb/sr *3*.
1051.7 *13*				dσ/dΩ=37 μb/sr *5*.
1061.8 *13*				dσ/dΩ=34 μb/sr *5*.
1093.8 *11*		1	0.372 *10*	dσ/dΩ=493 μb/sr *15*.
1104.1 *11*		1	0.062 *3*	dσ/dΩ=73 μb/sr *7*.
1121.3 *11*		1	0.032 *2*	dσ/dΩ=50 μb/sr *6*.
1135.5 *13*				dσ/dΩ=22 μb/sr *3*.
1192.6 *15*				dσ/dΩ=14 μb/sr *2*.
1207.3 *13*		1	0.030 *1*	dσ/dΩ=36 μb/sr *4*.
1241.6 *13*		2	0.034 *2*	dσ/dΩ=30 μb/sr *3*.
1266.4 *14*				dσ/dΩ=33 μb/sr *3*.
1302.5 *14*				dσ/dΩ=29 μb/sr *3*.
1336.0 *14*		3	0.235 *9*	dσ/dΩ=66 μb/sr *5*.
1382.8 *15*				dσ/dΩ=33 μb/sr *3*.
1406.9 *15*		(3)	0.11 *1*	dσ/dΩ=50 μb/sr *10*.
1463.8 *15*				dσ/dΩ=41 μb/sr *4*.
1500.9 *15*		1	0.051 *2*	dσ/dΩ=60 μb/sr *5*.
1513.0 *15*		1	0.065 *3*	S: for L=1. S=0.013 *5* for L=2. dσ/dΩ=83 μb/sr *5*.
1538.5 *16*		1	0.140 *4*	Additional information 4. dσ/dΩ=147 μb/sr *7*.
1575.8 *17*				dσ/dΩ=47 μb/sr *6*.
1628.3 *16*				dσ/dΩ=42 μb/sr *4*.

[†] The energy given by 2008Bu14 represents the average of values obtained from spectra at all the angles where the peak was observed. The quoted uncertainty includes the estimated calibration uncertainty. The 29.2-keV peak was used for normalization purposes since this state is more strongly populated than the ground state.

[‡] Spectroscopic strength. Additional uncertainty from choice of optical parameters is 20%. It is defined as S(L)= [(dσ/dΩ)exp]/[N(dσ/dΩ)(DW), where N=3.33. This definition of S(L) is twice that for the commonly used 'Nuclear structure factor', and it differs by a factor of (2j+1) from 'spectroscopic factors' used in other studies, where j=total angular momentum of the transferred particle.

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^{230}Th(d,t) 2008Bu14 (continued)

^{229}Th Levels (continued)

"Fingerprint" method (comparison of experimental spectroscopic strengths or cross sections of members of a rotational band with values predicted considering or not the Coriolis interaction) has been used by 2008Bu14 to assign levels to various bands based on single-particle Nilsson configurations.

@ Band(A): 5/2[633].

& Band(B): 3/2[631].

a Band(C): 5/2[752].

b Band(D): 1/2[631].

c Band(E): 1/2[501].

d Band(F): 3/2[501].

e Band(G): 5/2[503].

f Band(H): $K^{\pi}=1/2^{+}$.

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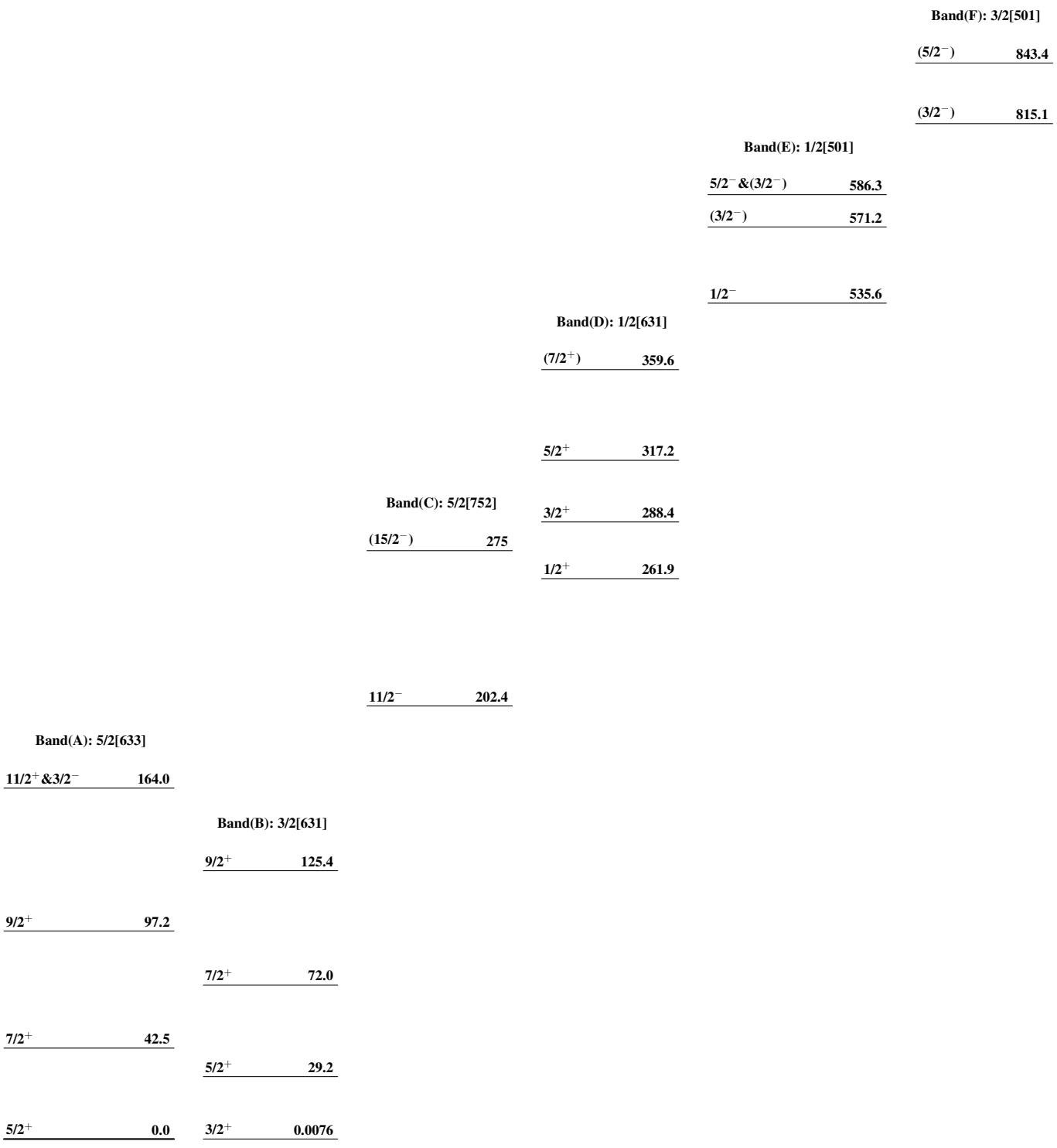

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^{230}Th(d,t) 2008Bu14 (continued)

Band(G): 5/2[503]

$(5/2^-)$ 778.8

Band(H): $K^\pi=1/2^+$

$3/2^+,5/2^+$ 479.1

$1/2^+$ 449.6

$^{229}_{90}Th_{139}$