^{205}Tl(^{3}He,3nγ) 1982Lo14

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 166, 1 (2020)	20-Apr-2020

E(^{3}He)=20-27 MeV, pulsed beam; Targets: isotopically enriched ^{205}Tl; Detectors: Ge(Li), intrinsic germanium detectors, Si(Li) detector; Measured: excitation functions, Eγ, Iγ, γ singles, $\gamma\gamma$ coin, $\gamma(\theta)$, γ(t), ce; Deduced: level scheme, J$^{\pi}$, $T_{1/2}$, α(K)exp, α(L)exp, K/L, transition multipolarities.

^{205}Bi Levels

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
0[#]	9/2^{-}	14.91 d *7*	J$^{\pi}$: From Adopted Levels.
795.8[@] *3*	11/2^{-}		
849.9[@] *4*	7/2^{-}		
873.0[@] *5*	5/2^{-}		
881.4[@] *4*	13/2^{-}		
1001.2[&] *4*	7/2^{-}		
1043.8[@] *4*	(9/2^{-})		
1109.9 *4*	13/2^{-}		
1167.6[#] *4*	15/2^{-}		
1194.2 *4*	(9/2^{-},11/2^{-})		
1238.3 *5*	7/2^{-}		
1310.2 *7*	(13/2^{-},15/2^{-})		
1336.3 *4*	5/2^{-}		
1343.6[#] *6*	17/2^{-}		
1437.0 *7*	(13/2^{-},15/2^{-})		
1472.8 *7*	1/2^{-}		
1487.2 *7*	3/2^{-}		
1497.8[a] *7*	1/2^{+}		
1572.1 *6*	17/2^{-}		
1591.8[c] *6*	13/2^{+}		
1709.8[b] *7*	3/2^{+}		
2040.8 *5*	17/2^{+}		
2063.8[d] *8*	(21/2^{+})	100 ns *6*	$T_{1/2}$: From 697.3γ(t) and 881.3γ(t) in 1982Lo14.

† From least-squares fit to Eγ by assuming ΔEγ=0.5 keV.

‡ From 1982Lo14, based on deduced γ-ray transition multipolarities and multiple γ-ray decay branches, unless otherwise stated.

\# configuration=$\pi(h^{+1}_{9/2})$.

@ configuration=$\pi(h^{+1}_{9/2})\otimes 2^{+}$.

& configuration=$\pi(f^{+1}_{7/2})$.

a configuration=$\pi(s^{+1}_{1/2})$.

b configuration=$\pi(d^{+1}_{3/2})$.

c configuration=$\pi(i^{+1}_{13/2})$.

d configuration=$\pi(h^{+1}_{9/2})\nu(p^{-1}_{3/2},i^{-1}_{13/2})$. The assignment is tentative.

$^{205}Tl(^{3}He,3n\gamma)$ 1982Lo14 (continued)

$\gamma(^{205}Bi)$

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	Comments
57.7 *1*		1167.6	15/2⁻	1109.9	13/2⁻		E_γ: From Adopted Levels.
176.1	12.0 *12*	1343.6	17/2⁻	1167.6	15/2⁻	M1	Mult.: α(L)exp=0.097 *14*, A_2=−0.22 *1*, A_4=−0.08 *1*.
193.8	1.00 *15*	1043.8	(9/2⁻)	849.9	7/2⁻	(M1)	Mult.: A_2=−0.1 *2*, A_4=0.1 *3*.
248.3	2.2 *3*	1043.8	(9/2⁻)	795.8	11/2⁻	(M1)	Mult.: α(K)exp=0.88 *10*, A_2=0.1 *2*, A_4=−0.2 *3*.
286.2	28 *3*	1167.6	15/2⁻	881.4	13/2⁻	M1	Mult.: α(K)exp=0.58 *6*, K/L=7.2, A_2=0.01 *2*, A_4=0.05 *3*.
314.2	23 *2*	1109.9	13/2⁻	795.8	11/2⁻	M1	Mult.: α(K)exp=0.38 *4*, A_2=−0.18 *1*, A_4=−0.04 *1*.
335.0	0.50 *8*	1336.3	5/2⁻	1001.2	7/2⁻	M1	Mult.: A_2=−0.00 *10*.
398.4	4.1 *6*	1194.2	(9/2⁻,11/2⁻)	795.8	11/2⁻	M1	Mult.: α(K)exp=0.17 *3*.
404.6	11 *2*	1572.1	17/2⁻	1167.6	15/2⁻	M1	Mult.: α(K)exp=0.130 *20*, A_2=−0.1 *3*, A_4=0.4 *4*.
428.8	4.8 *7*	1310.2	(13/2⁻,15/2⁻)	881.4	13/2⁻	M1	Mult.: α(K)exp=0.19 *3*, A_2=0.3 *2*, A_4=−0.2 *2*.
468.9	4.9 *7*	2040.8	17/2⁺	1572.1	17/2⁻	E1	Mult.: α(K)exp<0.05, A_2=0.1 *2*, A_4=0.13 *30*.
ˣ550.3	2.2 *3*					(M1)	Mult.: α(K)exp≈0.05.
555.6	1.30 *20*	1437.0	(13/2⁻,15/2⁻)	881.4	13/2⁻	M1	Mult.: α(K)exp=0.120 *18*.
599.8	6.0 *9*	1472.8	1/2⁻	873.0	5/2⁻	E2	Mult.: α(K)exp=0.016 *24*, A_2=−0.3 *4*, A_4=0.1 *6*.
614.2	2.3 *4*	1487.2	3/2⁻	873.0	5/2⁻	M1	Mult.: α(K)exp=0.094 *14*, A_2=0.17 *6*, A_4=0.2 *1*.
624.8	1.40 *21*	1497.8	1/2⁺	873.0	5/2⁻	M2	Mult.: α(K)exp=0.30 *5*.
697.3	20 *2*	2040.8	17/2⁺	1343.6	17/2⁻	E1	Mult.: α(K)exp=0.0050 *8*, A_2=0.25 *1*, A_4=−0.03 *2*.
720.2		2063.8	(21/2⁺)	1343.6	17/2⁻		
796.0	≈64	795.8	11/2⁻	0	9/2⁻	(M1)	E_γ: Doublet confirmed by γγ coin. Mult.: α(K)exp=0.023 *3*, K/L=5.3, A_2=−0.33 *1*, A_4=−0.04 *1*.
796.0	≈28	1591.8	13/2⁺	795.8	11/2⁻	(E1)	E_γ: Doublet confirmed by γγ coin. Mult.: α(K)exp=0.023 *3*, K/L=5.3, A_2=−0.33 *1*, A_4=−0.04 *1*.
836.8	4.6 *7*	1709.8	3/2⁺	873.0	5/2⁻		A_2=0.08 *4*, A_4=−0.22 *5*.
849.8	34 *4*	849.9	7/2⁻	0	9/2⁻	M1	Mult.: α(K)exp=0.019 *2*, K/L=5.3, A_2=−0.06 *2*, A_4=−0.01 *2*.
873	36 *4*	873.0	5/2⁻	0	9/2⁻	E2	E_γ,I_γ: Doublet. Mult.: α(K)exp=0.0070 *11*, A_2=0.04 *2*, A_4=−0.05 *3*.
873		2040.8	17/2⁺	1167.6	15/2⁻		
881.3	100 *10*	881.4	13/2⁻	0	9/2⁻	E2	Mult.: α(K)exp=0.0082 *8*, K/L=5.9, A_2=0.21 *1*, A_4=−0.06 *1*.
1001.2	19.0 *19*	1001.2	7/2⁻	0	9/2⁻	M1	Mult.: α(K)exp=0.0130 *17*, A_2=0.08 *2*, A_4=−0.06 *4*.
1043.7	22 *2*	1043.8	(9/2⁻)	0	9/2⁻	(M1)	Mult.: α(K)exp≈0.01.
1109.9	18 *2*	1109.9	13/2⁻	0	9/2⁻	E2	Mult.: α(K)exp=0.0035 *5*, A_2=0.24 *3*, A_4=−0.08 *4*.
1194.3	3.3 *5*	1194.2	(9/2⁻,11/2⁻)	0	9/2⁻		
1238.3	16.0 *22*	1238.3	7/2⁻	0	9/2⁻	M1	Mult.: α(K)exp=0.020 *3*, A_2=−0.10 *5*, A_4=0.1 *1*.
1336.3	7.2 *11*	1336.3	5/2⁻	0	9/2⁻	E2	Mult.: α(K)exp=0.0020 *3*, A_2=0.11 *3*, A_4=0.11 *5*.

† From 1982Lo14.
‡ From γ(θ), α(K)exp, α(L)exp, and K/L in 1982Lo14.
ˣ γ ray not placed in level scheme.

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