^{206}Pb(^{6}Li,3nγ) 1976Sj01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Chen # and F. G. Kondev	NDS 126, 373 (2015)	30-Sep-2013

1976Sj01: E=29-34 MeV ^{6}Li beams were produced from the Stony Brook tandem Van de Graaff accelerator. Targets were enriched metallic foils of ^{206}Pb (99%). γ-rays were detected by several Ge(Li) detectors (≈12% efficiency and FWHM=2-3 keV at E=1.33 MeV; FWHM=0.5 keV for Eγ<150 keV). Measured Eγ, Iγ, γ(θ,H,t), γγ-coin. Deduced levels, J^{π}, γ-multipolarities, g-factor, $T_{1/2}$, transition strengths.

^{209}At Levels

E(level)†	J^{π}#	$T_{1/2}$‡	Comments
0.0	9/2^{-}		J^{π}: from Adopted Levels.
408.7 *5*	(7/2^{-})@		
576.7 *4*	11/2^{-}		
724.7 *4*	13/2^{-}		
746.3 *7*	(7/2^{-})@		
789.0 *7*	(9/2)$^{-}$		J^{π}: from Adopted Levels.
1212.0 *7*			
1240.9 *7*	(13/2^{-})@		
1321.0 *7*	17/2^{-}		
1427.1 *7*	21/2^{-}	29 ns *2*	g=+0.95 *2* g: from γ(H,t) using TDPAD (1976Sj01), corrected for diamagnetism and Knight shift. $T_{1/2}$: from 596.3γ(t), 576.6γ(t) and 724.8γ(t) (1976Sj01).
1771.5 *8*	(15/2^{-})@		
1851.0 *9*	(23/2^{-})@		
2428.0 *13*	(29/2^{+})@	0.68 μs *8*	$T_{1/2}$: from 423.9γ(t) (1976Sj01).

† From a least-squares fit to γ-ray energies.
‡ $T_{1/2}$≤5 ns for all excited levels except the 1427 and 2428.
\# rom 1976Sj01, based on deduced γ-ray transition multipolarities, unless otherwise noted.
@ Tentative assignment by 1978Sj01.

γ(^{209}At)

Eγ	Iγ†	E_i(level)	J$^{π}_{i}$	E_f	J$^{π}_{f}$	Mult.#	α^{a}	$I_{(γ+ce)}$	Comments
106.1 *2*	5.8 *12*	1427.1	21/2^{-}	1321.0	17/2^{-}	E2	6.03 *10*	41‡ *8*	ce(K)/(γ+ce)=0.0559 *11*; ce(L)/(γ+ce)=0.593 *7*; ce(M)/(γ+ce)=0.159 *4*; ce(N+)/(γ+ce)=0.0499 *11* ce(N)/(γ+ce)=0.0411 *9*; ce(O)/(γ+ce)=0.00805 *18*; ce(P)/(γ+ce)=0.000813 *18* Iγ: from I(γ+ce) and theoretical conversion coefficient. Mult.: from conversion coefficient based on intensity balance and I(γ) in delayed spectrum (1976Sj01).
147.9 *2*	9.9 *20*	724.7	13/2^{-}	576.7	11/2^{-}	(M1)	3.97	49‡ *10*	ce(K)/(γ+ce)=0.647 *6*; ce(L)/(γ+ce)=0.1158 *20*; ce(M)/(γ+ce)=0.0274 *5*; ce(N+)/(γ+ce)=0.00883 *17*

Continued on next page (footnotes at end of table)

$^{206}Pb(^{6}Li,3n\gamma)$ **1976Sj01 (continued)**

$\gamma(^{209}At)$ (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
							ce(N)/(γ+ce)=0.00710 *14*; ce(O)/(γ+ce)=0.00152 *3*; ce(P)/(γ+ce)=0.000210 *4* I_γ: from I(γ+ce) and theoretical conversion coefficient assuming mult=M1. Mult.: lifetime limit $T_{1/2}$<5 ns rules out a pure E2 multipolarity (1976Sj01).
337.6 *5*		746.3	(7/2⁻)	408.7	(7/2⁻)		
380.3 *5*	18 *2*	789.0	(9/2)⁻	408.7	(7/2⁻)	(M1+E2)[&]	A_2=−0.07 *9*, A_4=−0.4 *3* (1976Sj01).
[x]386.9 *5*							
408.7 *5*	36 *4*	408.7	(7/2⁻)	0.0	9/2⁻		
423.9 *5*	18 *2*	1851.0	(23/2⁻)	1427.1	21/2⁻	(M1+E2)	Mult.: A_2=−0.26 *12*, A_4=−0.4 *3* (1976Sj01).
530.6 *5*	8 *1*	1771.5	(15/2⁻)	1240.9	(13/2⁻)	(M1+E2)[&]	Mult.: A_2=−0.59 *15*, A_4=−0.05 *5* (1976Sj01).
576.6 *5*	100 *10*	576.7	11/2⁻	0.0	9/2⁻	(M1+E2)	Mult.: A_2=−0.40 *32*, A_4=−0.05 *6* for 576.6γ+577γ, implies a dipole component (1976Sj01).
577 *1*	6.0 *6*	2428.0	(29/2⁺)	1851.0	(23/2⁻)		
596.3 *5*	70 *21*	1321.0	17/2⁻	724.7	13/2⁻	E2[@]	Mult.: A_2=+0.3 *1*, A_4=−0.1 *1* (1976Sj01).
635.3 *5*		1212.0		576.7	11/2⁻		
664.2 *5*	31 *3*	1240.9	(13/2⁻)	576.7	11/2⁻	(M1+E2)[&]	Mult.: A_2=−0.25 *6*, A_4=−0.3 *2* (1976Sj01).
724.8 *5*	100	724.7	13/2⁻	0.0	9/2⁻	E2[@]	Mult.: A_2=+0.27 *2*, A_4=−0.06 *4* (1976Sj01).

[†] From prompt spectrum normalized to 100 for the 724.8γ, unless otherwise noted.
[‡] Obtained by 1976Sj01 from intensity balance in delayed spectrum.
[#] From 1976Sj01 based on γ(θ), unless otherwise noted.
[@] Stretched quadrupole transition based on γ(θ) data. The lifetime limits rule out mult=M2.
[&] γ(θ) suggests D+Q, but M1/E2 assignment is most probable based on the lifetime limits.
[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[x] γ ray not placed in level scheme.

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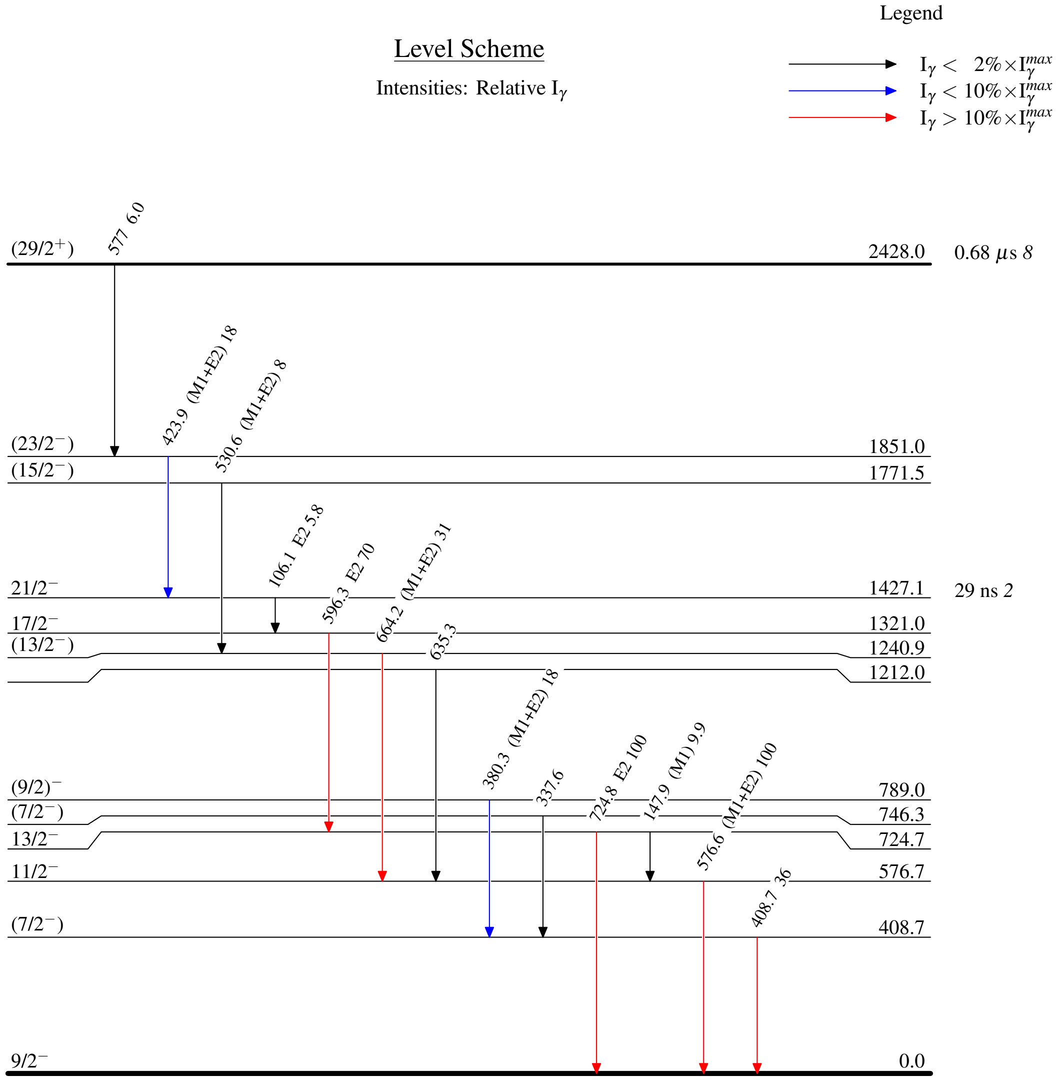
Level Scheme

Intensities: Relative I_γ



$^{209}_{85}At_{124}$