^{211}At α decay 1975Ja04,2001Ch66

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Lalkovski	NDS 112, 707 (2011)	1-Aug-2010

Parent: ^{211}At: E=0.0; $J^{\pi}=9/2^-$; $T_{1/2}$=7.214 h *7*; Q(α)=5982.4 *13*; %α decay=41.80 *8*

^{211}At-%α decay: Iα=41.80% 8 from Iα(^{211}At)/(Iα(^{211}Po)+Iα(^{211}At)). Weighted average of 41.94 *16* (1985La17), 41.74 *10* (1978Ya04), 41.8 *2* (1969Go23), 41.9 *5* (1975Ja04), and 40.9 *5* (1951Ne02).

1975Ja04: Facility: Lawrence Berkeley Laboratory; ^{209}Bi(α,2n) reaction at E(α)=27 MeV, chemically separated; Detectors: 10 cm^3 planar Ge(Li) detector (FWHM = 2.3 keV at 1.3 MeV), 35 cm^3 coaxial Ge(Li) detector (FWHM = 2.5 keV at 1.3 MeV), Si(Li) (FWHM = 2.2 keV at 975 keV), Au-Si surface-barrier detector (FWHM = 16 keV at 4.8 MeV); Measured: Eγ, Iγ, Ice, Iα.

2001Ch66: Facility: JINR, Dubna; Source: from ^{209}Bi(α,2n) reaction at E(α)=28 MeV, chemically separated; Detectors: 70 cm^3 Ge(Li) detector (FWHM = 2.7 keV at 1.3 MeV) with a 2 mm Pb filter to reduce the X-ray flux; Measured: Eγ, Iγ.

Others: 1985La17, 1982Bo04, 1978Ya04, 1970AfZZ, 1969Go23, 1953Ho49, 1951Ne02.

^{207}Bi Levels

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
0.0	$9/2^-$	31.55 y *4*	$T_{1/2}$: From Adopted Levels.
669.76 *9*	$11/2^-$		
742.75 *9*	$7/2^-$		
892.45 *9*	$9/2^-$		
992.43 *7*	$7/2^-$		

[†] From a least-squares fit to Eγ, unless otherwise stated.
[‡] From the Adopted Levels.

α radiations

Eα[†]	E(level)	Iα[‡@]	HF[#]	Comments
4895.4 *11*	992.43	<0.000096	>9.2	Eα: From Qα and adopted level energy. Iα: From 2001Ch66.
4997 *7*	892.45	≈0.0010	≈3.7	Eα,Iα: From 1970AfZZ.
5141 *2*	742.75	0.0025 *4*	10.7 *18*	Iα: 0.0023 *8* (1975Ja04) and 0.0026 *5* (2001Ch66). Other:0.004 *2* (1969Go23).
5210.0 *15*	669.76	0.0092 *7*	7.4 *7*	Iα: 0.0086 *19* (1975Ja04) and 0.0093 *7* (2001Ch66). Other:0.013 *2* (1969Go23).
5869.5 *22*	0.0	100	1.59 *7*	Eα: Value recommended by 1991Ry01, based on Eα=5862 keV *8* (1953Ho49), 5866 keV *2* (1969Go23), and 5866 keV *2* (1985La17). Alpha decay anisotropy measurements (1996Sc35, see also 1997Sc26 and 2000Sc46): A_2=0.400 *11* A_4=0.006 *18*; δ_{02}=0.201 *5* and δ_{04}=−0.013 *10*; deduced 3.88% L=2 admixtures.

[†] From 1969Go23, using magnetic spectrograph, unless otherwise noted.
[‡] Weighted average of the 1975Ja04 and 2001Ch66 data, unless otherwise stated.
[#] r_0(^{207}Bi)=1.422 *13*. Unweighted average of r_0(^{206}Pb)=1.40882 *10* and r_0(^{208}Po)=1.4343 *34* in 1998Ak04.
[@] For absolute intensity per 100 decays, multiply by 0.4180 *8*.

^{211}At α decay 1975Ja04,2001Ch66 (continued)

γ(^{207}Bi)

E_γ[†]	I_γ[‡#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[@]	Comments
149.697 *7*	≈0.00012	892.45	9/2⁻	742.75	7/2⁻	M1(+E2)	<0.6	3.0 *3*	
222.690 *9*	≈0.000085	892.45	9/2⁻	669.76	11/2⁻	M1(+E2)	≤0.51	0.98 *8*	
669.78 *11*	0.0088 *7*	669.76	11/2⁻	0.0	9/2⁻	M1+E2	+0.24 *4*	0.0522 *11*	E_γ: 669.6 keV *2* in 1975Ja04.
742.72 *15*	0.0025 *7*	742.75	7/2⁻	0.0	9/2⁻	M1+E2	+0.334 *10*	0.0386 *6*	E_γ: 742.7 keV *5* in 1975Ja04.
892.4 *3*	≈0.00034	892.45	9/2⁻	0.0	9/2⁻	E2+M1	1.4 *2*	0.0145 *13*	

† From adopted gammas.
‡ From Iα, branching and mixing ratios from adopted gammas and α.
# For absolute intensity per 100 decays, multiply by 0.4180 *8*.
@ 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.

^{211}At α decay 1975Ja04,2001Ch66

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays