^{208}Pb(^{18}O,Xγ) 2011As05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 181, 475 (2022)	1-Jan-2022

Adapted/Edited the XUNDL dataset compiled by B. Singh (McMaster); Mar 05, 2011.

E=85 MeV from Vivitron tandem of IReS (Strasbourg). Measured Eγ, Iγ, γγ coin, γ(θ) (ADOs) using Euroball IV array with 71 Compton- suppressed Ge detector systems (15 clusters, 26 clovers and 30 tapered single-Ge detectors; cluster is composed of seven large volume Ge crystals and a clover of four smaller Ge crystals; thus a total 239 individual Ge crystals). Some revisions proposed for J^π assignments of low-spin levels of ^{213}Po populated in the β^- decay of ^{213}Bi.

Measured $\sigma \approx 0.3$ mb for the production of ^{213}Po in the reaction used. From this low cross section, 2011As05 proposed that levels in ^{213}Po were populated by neutron emission of high-lying levels in ^{214}Po for which the production cross section σ=0.5-1 mb.

Proposed revisions of J^π assignments in ^{213}Bi decay: 293 level: $7/2^+$ instead of $(11/2^+)$; 440 level: $11/2^+$ instead of $(7/2^+)$; 868 level: $9/2^+$ instead of $(13/2^+)$, for $J^\pi=13/2^+$, it was expected to be populated in the 2011As05 work.

^{213}Po Levels

E(level)†	Jπ#	Comments
0.0‡	$9/2^+$	
645.6‡ 5	$13/2^+$	
1068.4‡ 2	$17/2^+$	
1357.4‡ 2	$21/2^+$	
1412.9 5		
1503.6 5	$(25/2^+)$	Possible configuration: $\pi\ (h^{+2}_{9/2})\otimes\nu\ (g^{+1}_{9/2})$, $\pi\ h^2_{9/2}\otimes\nu\ i_{11/2}$ (2011As05 – probably a misprint).
1619.1 5	$(23/2^+)$	
1779.6 4		
2017.2 7		

† From Eγ data.

‡ Yrast sequence. Possible configuration: $9/2^+$: $\nu\ (g^{+1}_{9/2})$, $13/2^+$: $\nu\ (g^{+1}_{9/2})\otimes 2^+$, $17/2^+$: $\nu\ (g^{+1}_{9/2})\otimes 4^+$, and $21/2^+$: $\nu\ (g^{+1}_{9/2})\otimes 6^+$.

Proposed by 2011As05 based on γ-ray multipole assignments.

γ(^{213}Po)

Eγ†	Iγ	Ei(level)	J^π_i	Ef	J^π_f	Mult.‡	α#	Comments
146.2 5	8 2	1503.6	$(25/2^+)$	1357.4	$21/2^+$	(E2)	1.512 29	α(K)=0.313 5; α(L)=0.889 19; α(M)=0.237 5 α(N)=0.0607 13; α(O)=0.01159 24; α(P)=0.001061 22 α(exp)=1.5 5 (0.15 5 in 2011As05 probably a misprint). Mult.: Proposed by 2011As05 based on α(exp), extracted from intensity imbalances measured in spectra in double coincidence with the 146 keV transition and either the 423 or the 646 keV transition.
261.7 5	4.8 14	1619.1	$(23/2^+)$	1357.4	$21/2^+$			
289.0 1	60 10	1357.4	$21/2^+$	1068.4	$17/2^+$	Q		R_{ADO}=1.3 2.
344.5 5	15 5	1412.9		1068.4	$17/2^+$			
398.1 5	3.5 12	2017.2		1619.1	$(23/2^+)$			
422.8 1	100	1068.4	$17/2^+$	645.6	$13/2^+$	Q		R_{ADO}=1.18 10.
645.6 5		645.6	$13/2^+$	0.0	$9/2^+$	Q		R_{ADO}=1.25 10.
711.2 3	24 6	1779.6		1068.4	$17/2^+$			

Continued on next page (footnotes at end of table)

^{208}Pb(^{18}O,Xγ) 2011As05 (continued)

$\gamma(^{213}Po)$ (continued)

† 2011As05 state uncertainty as 0.1-0.5 keV. The evaluator assigns as follows: 0.1 keV for intense γ rays (Iγ>40), 0.3 keV for Iγ=20-40, 0.5 keV for Iγ<20.

‡ Assigned by the evaluator, except where otherwise noted, based on the angular anisotropy ratio, R_{ADO}=Iγ(39.3°)/Iγ(76.6°), with respect to the beam axis for the most intense γ rays. It appears that for a quadrupole transition R_{ADO} ~ 1.2 was expect, not mentioned in 2011As05.

Additional information 1.

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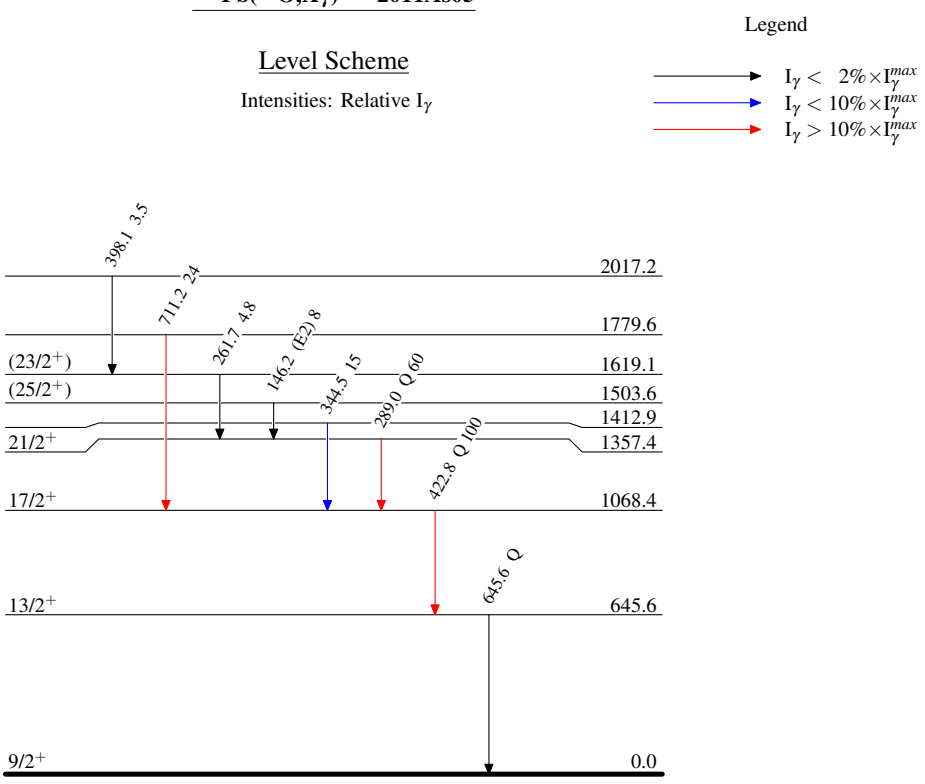
Level Scheme

Intensities: Relative I_γ



$^{213}_{84}Po_{129}$