^{9}Be(^{238}U,Fγ) 2016Re03,2019Bi04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	H. Iimura, J. Katakura, S. Ohya	NDS 180, 1 (2022)	1-Oct-2021

2016Re03: E(^{238}U)=1.29 GeV on a 10 μm thick Be target. Fragments separated with the VAMOS++ magnetic spectrometer and identified on an event-by-event basis using measurements of time-of-flight, magnetic rigidity, energy loss and total energy. Measured Eγ, Iγ, recoil-γ, $\gamma\gamma$ coincidences using the EXOGAM array. Deduced level energies, J^{π}, B(M1)/B(E2) ratios.

2019Bi04: E(^{238}U)=6.2 MeV/nucleon on 1.6 μm and 5 μm thick ^{9}Be targets. Fragments identified in atomic weight, atomic number and charge state (A,Z,q) using the VAMOS++ magnetic spectrometer. Prompt γ rays (γ_P) were detected using AGATA γ-ray tracking array, consisting of 32 crystals, placed at the target position. The delayed γ rays (γ_D) were detected by using seven EXOGAM HPGe Clover detectors, arranged in a wall-like configuration at the focal plane of VAMOS++. Measured Eγ, Iγ, (fragment)γ-coin, $\gamma\gamma$-coin in terms of three matrices: γ_P-γ_P, γ_D-γ_D, and γ_P-γ_D. Deduced level energies, J^{π}, isomer half-lives, B(M1)/B(E2) ratios.

^{126}Sb Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
0.0[#]	(8$^-$)	12.35 d *6*	T$_{1/2}$: from the Adopted Levels.
671.3[#] *10*	(9$^-$)		
1044.8[#] *10*	(10$^-$)		
1689.4[@] *13*	(11$^+$)	60 ns *20*	T$_{1/2}$: from 644.6γ-fragment(t) (2019Bi04), using two-component fit with one component fixed at 90 ns.
1810.7 *17*	(13$^+$)	90 ns *16*	T$_{1/2}$: from 121.3γ-fragment(t) (2019Bi04), using one-component fit.
2006.2[#] *13*	(12$^-$)		
2191.2[@] *17*	(12$^+$)		
2359.1[#] *17*	(14$^-$)		
2682.6[@] *20*	(13$^+$)		
2802.4[#] *20*	(15$^-$)		
2812.7[@] *22*	(14$^+$)		
2911.8 *20*	(15$^+$)		
3214.3[#] *22*	(16$^-$)		
3637.8[#] *24*	(17$^-$)		
4135[#] *3*	(18$^-$)		

[†] Least-squares fit to γ-ray energies.
[‡] From 2019Bi04 based on decay patterns and systematics.
[#] Seq.(A): γ cascade based on (8$^-$).
[@] Seq.(B): γ cascade based on (11$^+$).

γ(^{126}Sb)

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^{\pi}$	E$_f$	J$_f^{\pi}$	Mult.[c]
121.3[‡] *10*	70[b] *43*	1810.7	(13$^+$)	1689.4	(11$^+$)	
130.1[@] *10*	44[a] *4*	2812.7	(14$^+$)	2682.6	(13$^+$)	
352.9[@] *10*	72[&] *7*	2359.1	(14$^-$)	2006.2	(12$^-$)	(E2)
373.5[#] *10*	35[&] *5*	1044.8	(10$^-$)	671.3	(9$^-$)	(M1)
411.9[@] *10*	39[&] *5*	3214.3	(16$^-$)	2802.4	(15$^-$)	
423.5[@] *10*	17[&] *2*	3637.8	(17$^-$)	3214.3	(16$^-$)	

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^{9}Be(^{238}U,Fγ) 2016Re03,2019Bi04 (continued)

γ(^{126}Sb) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]
443.3[@] *10*	59[&] *7*	2802.4	(15$^-$)	2359.1	(14$^-$)	(M1)
491.4[@] *10*	78[a] *7*	2682.6	(13$^+$)	2191.2	(12$^+$)	
497.6[@] *10*	13[&] *2*	4135	(18$^-$)	3637.8	(17$^-$)	
501.8[@] *10*	100	2191.2	(12$^+$)	1689.4	(11$^+$)	
644.6[‡] *10*	76[b] *29*	1689.4	(11$^+$)	1044.8	(10$^-$)	
671.2[#] *10*	100	671.3	(9$^-$)	0.0	(8$^-$)	(M1)
961.4[@] *10*	79[&] *11*	2006.2	(12$^-$)	1044.8	(10$^-$)	(E2)
1044.9[#] *10*	87[&] *7*	1044.8	(10$^-$)	0.0	(8$^-$)	(E2)
1101.1[@] *10*	100	2911.8	(15$^+$)	1810.7	(13$^+$)	

[†] From 2019Bi04.
[‡] Delayed transitions.
[#] Delayed and prompt transitions.
[@] Prompt transitions.
[&] Normalized to 100 for the prompt 671.2γ from (9$^-$).
[a] Normalized to 100 for the 501.8γ from (12$^+$).
[b] Normalized to the intensity of the delayed 1044.9γ from (10$^-$).
[c] 2016Re03 assume E2 multipolarity for all ΔJ=2 transitions, as their experimental setup is only sensitive to states with lifetimes less than 2 ns. With the observation of crossover transitions, 2016Re03 assume ΔJ=1 in the sequence of adjacent levels and assume such transitions are M1 which are favored over E2 for low-energy transitions.

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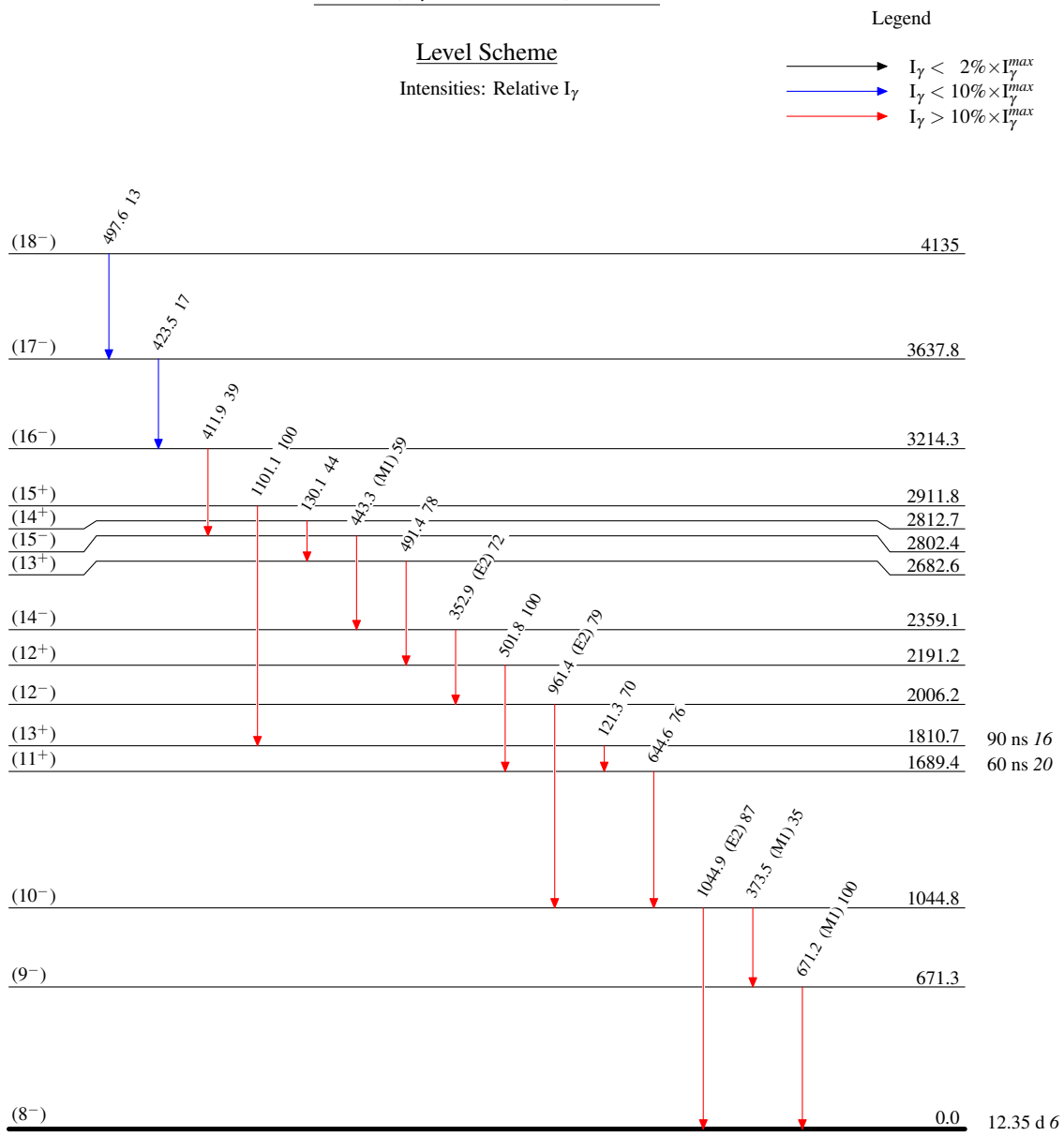
Level Scheme

Intensities: Relative I_γ



$^{126}_{51}Sb_{75}$

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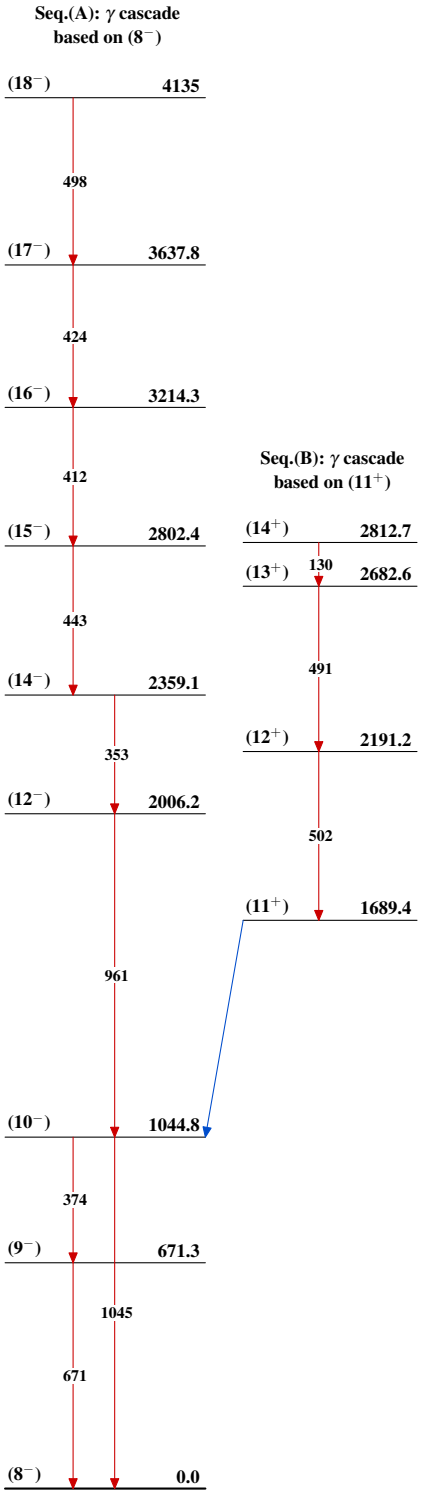

$^{126}_{51}Sb_{75}$