^{238}U(^{76}Ge,Xγ) 2009St12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 158, 1 (2019)	16-May-2019

2009St12: E=530 MeV ^{76}Ge beam was produced from the ATLAS accelerator at Argonne National Laboratory. Target was 55 mg/cm^2 isotopically enriched ^{238}U. γ rays were detected by the Gammasphere array consisting of 100 Compton-suppressed HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma\gamma$-coin. Deduced levels, J, π, band structures. Systematics of neighboring nuclei.

^{73}Ga Levels

E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0.0	1/2$^-$	651.34[a] *21*	(7/2$^-$)	1813.6[&] *3*	(13/2$^+$)	3828.7[a] *6*	(19/2$^-$)
<0.3[#]	3/2$^-$[#]	952.53 *20*	7/2$^-$	2528.2[@] *4*	(13/2$^-$)	3973.7[&] *5*	(21/2$^+$)
199.24 *21*	5/2$^-$	1232.24[&] *24*	(9/2$^+$)	2718.4[&] *4*	(17/2$^+$)	5292.9[&] *7*	(25/2$^+$)
218.27 *15*	3/2$^-$	1397.7[@] *3*	(9/2$^-$)	2761.4[a] *4*	(15/2$^-$)		
496.34[@] *21*	(5/2$^-$)	1596.5[a] *3*	(11/2$^-$)	3397.6[@] *7*	(17/2$^-$)		

[†] From a least-squares fit to γ-ray energies. For fitting purpose, energy of the <0.3 keV level is fixed at 0.15 keV *15*.
[‡] Proposed by 2009St12 based on systematics of neighboring odd-A Ga isotopes and band structures.
[#] From Adopted Levels. This level was assigned by 2009St12 as the g.s. level but should correspond to a closely-spaced level at <0.3 keV, as described in detail in Adopted Levels, Gammas dataset.
[@] Seq.(A): γ cascade based on (5/2$^-$).
[&] Seq.(B): γ cascade based on (9/2$^+$).
[a] Seq.(C): γ cascade based on (7/2$^-$).

γ(^{73}Ga)

E$_\gamma$[†]	I$_\gamma$[#]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
155.0 *5*	1.7 *2*	651.34	(7/2$^-$)	496.34	(5/2$^-$)
199.1 *2*	69.2 *5*	199.24	5/2$^-$	<0.3	3/2$^-$
218.2[‡] *2*	6.4 *3*	218.27	3/2$^-$	0.0	1/2$^-$
279.7 *2*	100	1232.24	(9/2$^+$)	952.53	7/2$^-$
433.0 *5*	2.2 *2*	651.34	(7/2$^-$)	218.27	3/2$^-$
452.1 *2*	18.5 *7*	651.34	(7/2$^-$)	199.24	5/2$^-$
456.2 *2*	11.4 *3*	952.53	7/2$^-$	496.34	(5/2$^-$)
496.2 *2*	10.7 *4*	496.34	(5/2$^-$)	<0.3	3/2$^-$
580.9 *2*	72.4[@] *5*	1232.24	(9/2$^+$)	651.34	(7/2$^-$)
581.4 *2*	87.5[@] *8*	1813.6	(13/2$^+$)	1232.24	(9/2$^+$)
651.2 *2*	10.7 *1*	651.34	(7/2$^-$)	<0.3	3/2$^-$
734.2 *2*	5.6 *2*	952.53	7/2$^-$	218.27	3/2$^-$
753.3 *2*	48.2 *8*	952.53	7/2$^-$	199.24	5/2$^-$
869.4 *5*	3.3 *5*	3397.6	(17/2$^-$)	2528.2	(13/2$^-$)
901.4 *2*	7.5 *6*	1397.7	(9/2$^-$)	496.34	(5/2$^-$)
904.8 *2*	33.3 *5*	2718.4	(17/2$^+$)	1813.6	(13/2$^+$)
945.2 *2*	9.4 *5*	1596.5	(11/2$^-$)	651.34	(7/2$^-$)
952.4 *2*	38.4 *4*	952.53	7/2$^-$	<0.3	3/2$^-$
1067.3 *5*	4.1 *2*	3828.7	(19/2$^-$)	2761.4	(15/2$^-$)
1130.4 *2*	5.1 *2*	2528.2	(13/2$^-$)	1397.7	(9/2$^-$)
1164.8 *2*	5.2 *4*	2761.4	(15/2$^-$)	1596.5	(11/2$^-$)
1255.2 *2*	11.5 *4*	3973.7	(21/2$^+$)	2718.4	(17/2$^+$)
1319.2 *5*	3.1 *2*	5292.9	(25/2$^+$)	3973.7	(21/2$^+$)

Continued on next page (footnotes at end of table)

^{238}U(^{76}Ge,Xγ) 2009St12 (continued)

γ(^{73}Ga) (continued)

† From 2009St12. The final level of the transitions to g.s. in 2009St12 should be to <0.3 keV level, instead, except for the 218.2γ according to Adopted Levels, Gammas dataset, which proceeds to g.s.
‡ Final level is g.s. with $J^{\pi}=1/2^{-}$ according to Coulomb excitation (2010Di14), as also in Adopted Gammas.
# Relative intensity normalized to Iγ(279.7γ)=100 (2009St12).
@ Doublet. The summed intensity of 580.9γ and 581.4γ is 158 *2* in 2009St12.

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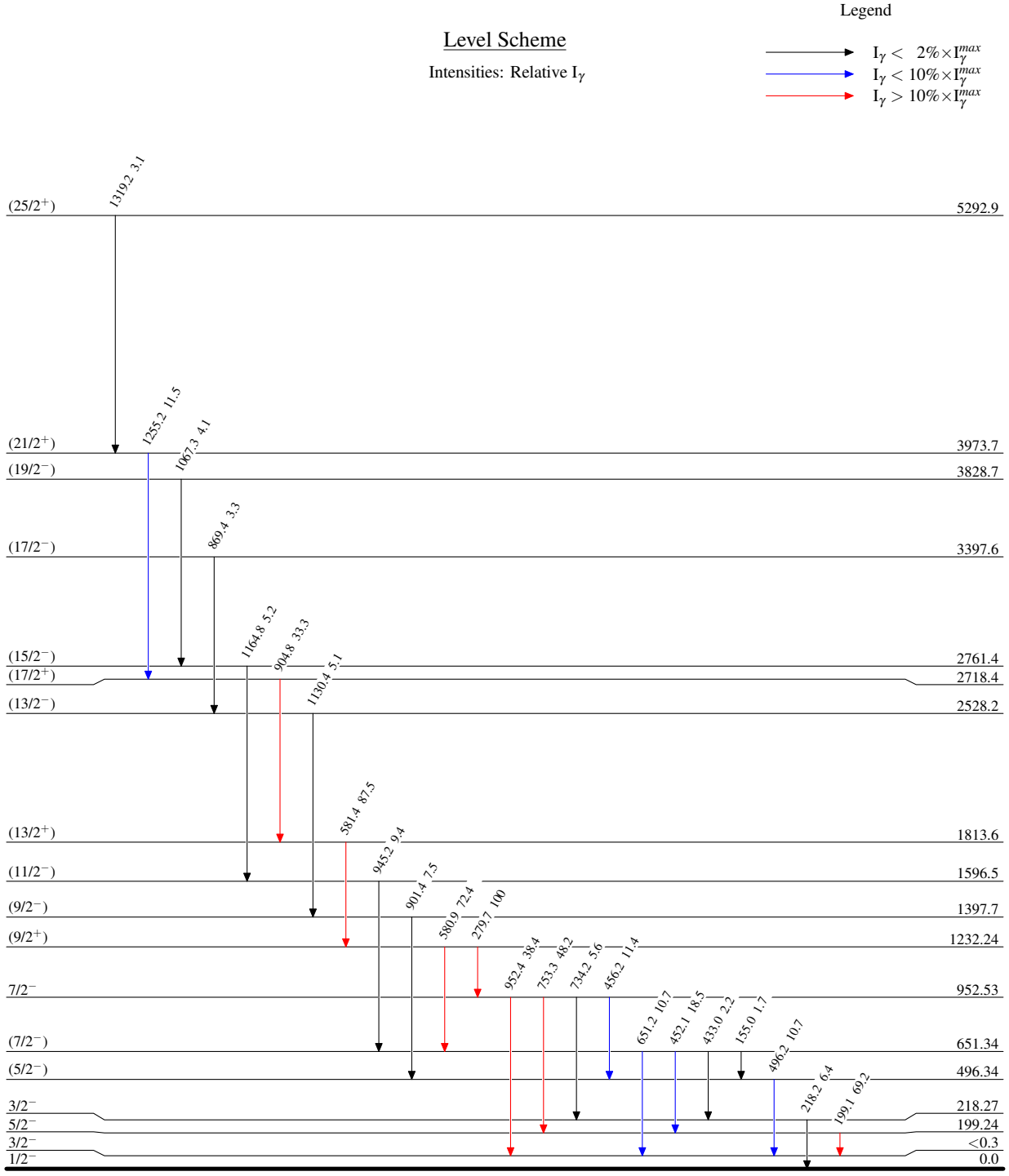
Level Scheme

Intensities: Relative I_γ



$^{73}_{31}Ga_{42}$

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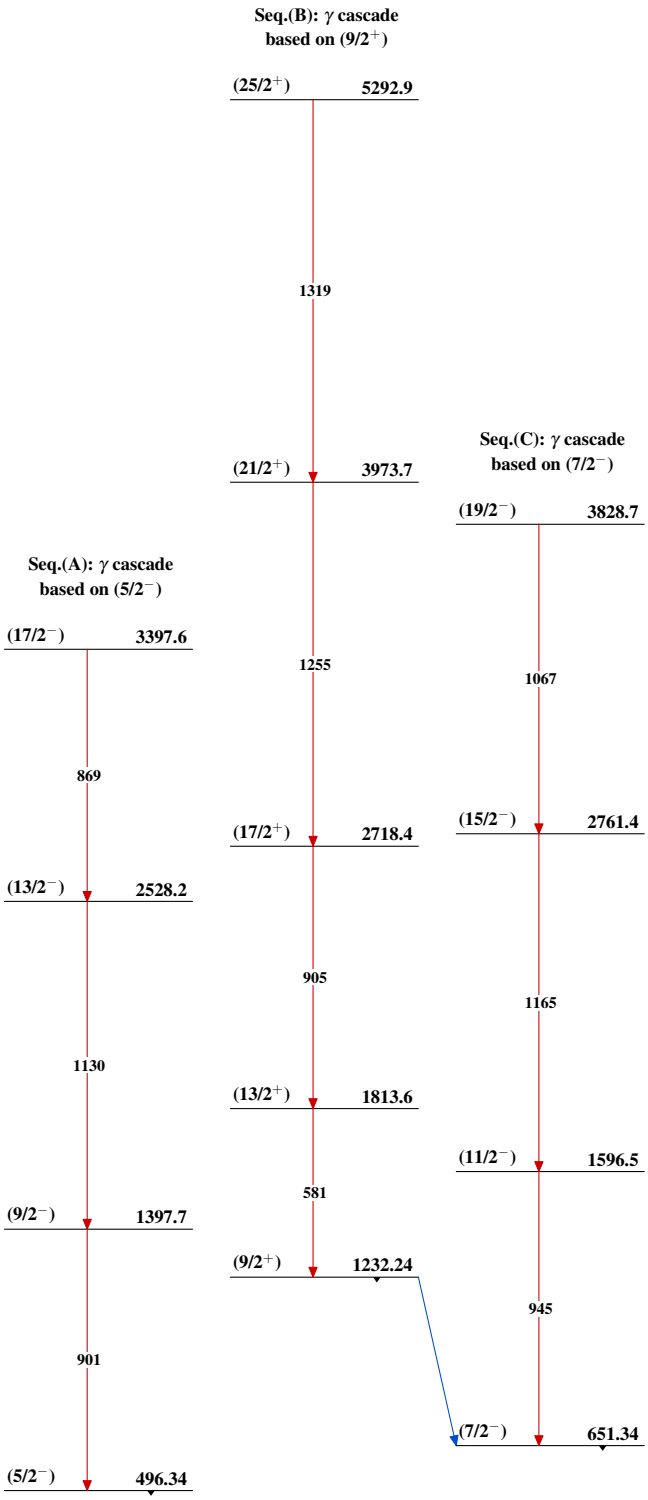

$^{73}_{31}Ga_{42}$