^{238}U(^{64}Ni,Xγ) E=430 MeV 2008Ho05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Kazimierz Zuber, Balraj Singh	NDS 125, 1 (2015)	25-Jan-2015

2008Ho05: ^{61}Fe produced in ^{238}U(^{64}Ni,Xγ) reaction at a beam energy of 430 MeV (25% above the Coulomb barrier) by ATLAS accelerator at ANL. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ using GAMMASPHERE array of 100 Compton-suppressed HPGe detectors. Prompt and delayed coincidence events in various configurations were recorded. Comparisons with shell-model calculations and particle-triaxial-rotor model predictions.

^{61}Fe Levels

E(level)†	J$^\pi$‡	T$_{1/2}$	Comments
0.0#	3/2$^-$		
207.00# *10*	5/2$^-$		
861.80@ *15*	9/2$^+$	238 ns *5*	T$_{1/2}$: from Adopted Levels.
959.51# *23*	7/2$^-$		
1476.6# *3*	(5/2$^-$,9/2$^-$)		
1650.31@ *18*	13/2$^+$		
2992.7@ *4*	17/2$^+$	<0.12 ps	T$_{1/2}$: Given Q$_0$=+1.15 estimate the mean lifetime of the 1342 keV, 17/2$^+$ to 13/2$^+$ transition to be τ=0.4 ps.
3528.8 *4*	(17/2$^+$,15/2$^+$)		
3541.4 *7*			
3714.4 *7*			
4144.6 *4*	(19/2$^+$)		
4292.4 *4*	(19/2$^+$,17/2$^+$)		
4675.4@ *5*	(21/2$^+$)		

† From least-squares fit to Eγ data.
‡ As proposed in 2008Ho05 based on $\gamma\gamma(\theta)$ data for selected transitions, yrast nature of population of states, and shell-model calculations.
# Band(A): The g.s. band.
@ Band(B): ν9/2[404] band.

γ(^{61}Fe)

E$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.†	Comments
207.0 *1*	207.00	5/2$^-$	0.0	3/2$^-$	D	
517.1 *2*	1476.6	(5/2$^-$,9/2$^-$)	959.51	7/2$^-$		
536.1 *3*	3528.8	(17/2$^+$,15/2$^+$)	2992.7	17/2$^+$		
654.8 *1*	861.80	9/2$^+$	207.00	5/2$^-$	Q	(654.8γ)(207.0γ)(θ): A$_2$=−0.03 *4*, A$_4$=+0.07 *5* consistent with quadrupole-dipole cascade.
752.5 *2*	959.51	7/2$^-$	207.00	5/2$^-$	D	(752.5γ)(207.0γ)(θ): A$_2$=+0.26 *4*, A$_4$=+0.07 *6* consistent with dipole-dipole cascade.
763.6 *2*	4292.4	(19/2$^+$,17/2$^+$)	3528.8	(17/2$^+$,15/2$^+$)		
788.5 *1*	1650.31	13/2$^+$	861.80	9/2$^+$	Q	(788.5γ)(654.8γ)(θ): A$_2$=+0.18 *4*, A$_4$=+0.05 *6* consistent with quadrupole-quadrupole cascade.
1151.9 *2*	4144.6	(19/2$^+$)	2992.7	17/2$^+$		
1300‡	4292.4	(19/2$^+$,17/2$^+$)	2992.7	17/2$^+$		
1342.3 *3*	2992.7	17/2$^+$	1650.31	13/2$^+$	Q	(1342.3γ)(788.5γ)(θ): A$_2$=+0.12 *11*, A$_4$=0.00 *16* consistent with quadrupole-quadrupole cascade.
1682.7 *3*	4675.4	(21/2$^+$)	2992.7	17/2$^+$		
1878.6 *4*	3528.8	(17/2$^+$,15/2$^+$)	1650.31	13/2$^+$		

Continued on next page (footnotes at end of table)

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$\gamma(^{61}Fe)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π
1891.1 *6*	3541.4		1650.31	$13/2^+$
2064.1 *6*	3714.4		1650.31	$13/2^+$

† From angular correlation $\gamma\gamma(\theta)$ analysis.
‡ Placement of transition in the level scheme is uncertain.

Legend

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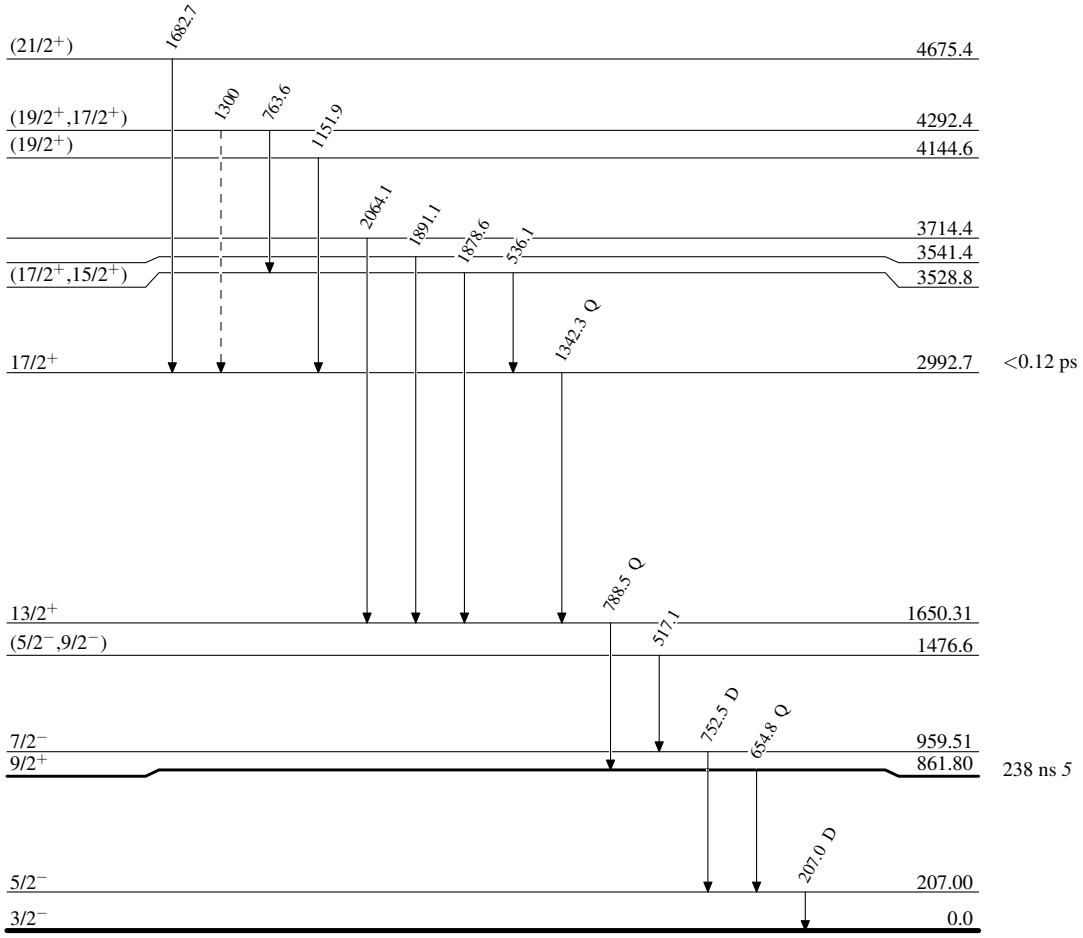
Level Scheme

γ Decay (Uncertain)



$^{61}_{26}Fe_{35}$

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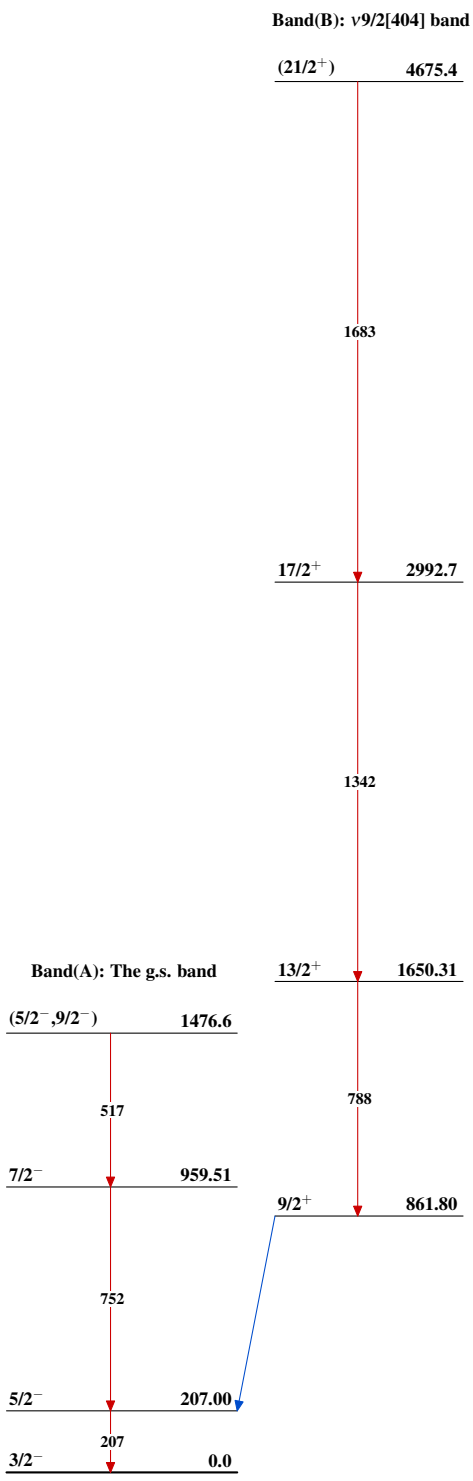

$^{61}_{26}Fe_{35}$