^{238}U(^{64}Ni,Xγ),^{64}Ni(^{238}U,Xγ) 2010Ho13,2007Lu13,2010Lj01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alan L. Nichols, Balraj Singh, Jagdish K. Tuli	NDS 113, 973 (2012)	15-Apr-2012

2010Ho13: ^{238}U(^{64}Ni,Xγ) E=430 MeV beam provided by ATLAS facility at Argonne. Target=55 mg/cm^2. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ using GAMMASPHERE array of 100 Compton-suppressed HPGe detectors. Comparisons with shell-model calculations made using *pf* and *pfg* basis space.

2010Lj01 (also 2011Di04): ^{64}Ni(^{238}U,Xγ) E=6.5 MeV/nucleon; measured lifetime of the first 2$^+$ state at GANIL facility using recoil-distance Doppler shift (RDDS) method with a plunger device. The magnetic rigidity of the spectrometer was optimized for the transmission of ^{64}Fe.

2007Lu13: ^{238}U(^{64}Ni,Xγ) E=400 MeV beam provided by LNL Tandem-ALPI accelerator. Nuclei detected by means of PRISMA large acceptance magnetic spectrometer. Measured Eγ, Iγ, $\gamma\gamma$ coin. using CLARA array containing 25 clover Ge detectors with Compton-suppression. Comparisons made with shell-model calculations.

All data are from 2010Ho13, unless otherwise specified.

Level scheme is from 2010Ho13, extended from that previously proposed by 2007Lu13.

^{62}Fe Levels

E(level)†	J$^\pi$#	T$_{1/2}$	Comments
0.0@	0$^+$		
877.31‡@ *10*	2$^+$	5.1 ps *6*	T$_{1/2}$: from RDDS and differential decay-curve analysis (2010Lj01).
2176.51‡@ *14*	4$^+$		
2691.7 *4*	(3)$^+$		
3008.86& *21*	(4$^-$)		
3015.69‡a *17*	5$^{(-)}$		
3310.05‡& *21*	(6$^-$)		
3387.84‡@ *17*	6$^+$		
3604.87‡a *19*	7$^{(-)}$		
3629.4 *3*			
4251.77‡@ *20*	8$^+$		
4358.84& *25*	(8$^-$)		
4902.2a *4*	(9$^-$)		
5319.5@ *3*	(10$^+$)		
5474?			

† From least-squares fit to Eγ data.
‡ Level also reported in 2007Lu13.
# As proposed in 2010Ho13 and 2007Lu13 based on band structures, systematics and $\gamma(\theta)$ data for selected transitions.
@ Band(A): Yrast band.
& Band(B): Band based on (4$^-$),α=0.
a Band(b): Band based on 5$^{(-)}$,α=1.

γ(^{62}Fe)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
241.6 *2*	5.0 *10*	3629.4		3387.84	6$^+$	
294.3† *2*	17.0 *15*	3310.05	(6$^-$)	3015.69	5$^{(-)}$	Mult.: (M1) in 2010Ho13.
294.8 *3*	1.4 *5*	3604.87	7$^{(-)}$	3310.05	(6$^-$)	Mult.: (M1) in 2010Ho13.
301.2 *2*	1.9 *5*	3310.05	(6$^-$)	3008.86	(4$^-$)	Mult.: (E2) in 2010Ho13.
317.0 *4*	0.7 *3*	3008.86	(4$^-$)	2691.7	(3)$^+$	Mult.: (E1) in 2010Ho13.

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γ(^{62}Fe) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
589.2† *1*	22.8 *12*	3604.87	$7^{(-)}$	3015.69	$5^{(-)}$	(Q)	A_2=+0.14 *4*; A_4=+0.05 *6* Mult.: E2 in 2010Ho13.
647.1 *3*	1.2 *6*	4251.77	8^+	3604.87	$7^{(-)}$		Mult.: (E1) in 2010Ho13.
754.0 *2*	1.4 *4*	4358.84	(8^-)	3604.87	$7^{(-)}$		Mult.: (M1) in 2010Ho13.
832.4 *2*	8.6 *15*	3008.86	(4^-)	2176.51	4^+	(D)	A_2=+0.18 *10*; A_4=0.00 *15* Mult.: (E1) in 2010Ho13.
839.2† *1*	51.0 *25*	3015.69	$5^{(-)}$	2176.51	4^+	D	A_2=−0.07 *2*; A_4=+0.05 *3* Mult.: (E1) in 2010Ho13.
863.9† *1*	17.8 *14*	4251.77	8^+	3387.84	6^+	(Q)	A_2=+0.14 *5*; A_4=+0.07 *8* Mult.: E2 in 2010Ho13.
877.3† *1*		877.31	2^+	0.0	0^+	(E2)	A_2=+0.12 *1*; A_4=+0.03 *2* B(E2)=0.0214 *26* from measured half-life of 5.1 ps *6*. Mult.: E2 in 2010Ho13.
1048.7 *3*	3.2 *8*	4358.84	(8^-)	3310.05	(6^-)		Mult.: (E2) in 2010Ho13.
1067.7 *2*	5.1 *7*	5319.5	(10^+)	4251.77	8^+		Mult.: (E2) in 2010Ho13.
1211.3† *1*	26.5 *15*	3387.84	6^+	2176.51	4^+	(Q)	A_2=+0.12 *4*; A_4=+0.01 *6* Mult.: E2 in 2010Ho13.
1222#		5474?		4251.77	8^+		
1297.3 *3*	2.4 *8*	4902.2	(9^-)	3604.87	$7^{(-)}$		Mult.: (E2) in 2010Ho13.
1299.2† *1*	100	2176.51	4^+	877.31	2^+		Mult.: E2 in 2010Ho13.
1814.0 *5*	0.7 *3*	2691.7	$(3)^+$	877.31	2^+		Mult.: M1 in 2010Ho13.

† This γ also reported in 2007Lu13.

‡ From $\gamma(\theta)$. 2010Ho13 assign tentative multipolarities to some other γ rays, as stated in the comments. However, these multipolarities have not adopted by the evaluators due to a lack of supporting arguments other than simply implied by the spins and parities of levels assigned in 2010Ho13.

Placement of transition in the level scheme is uncertain.

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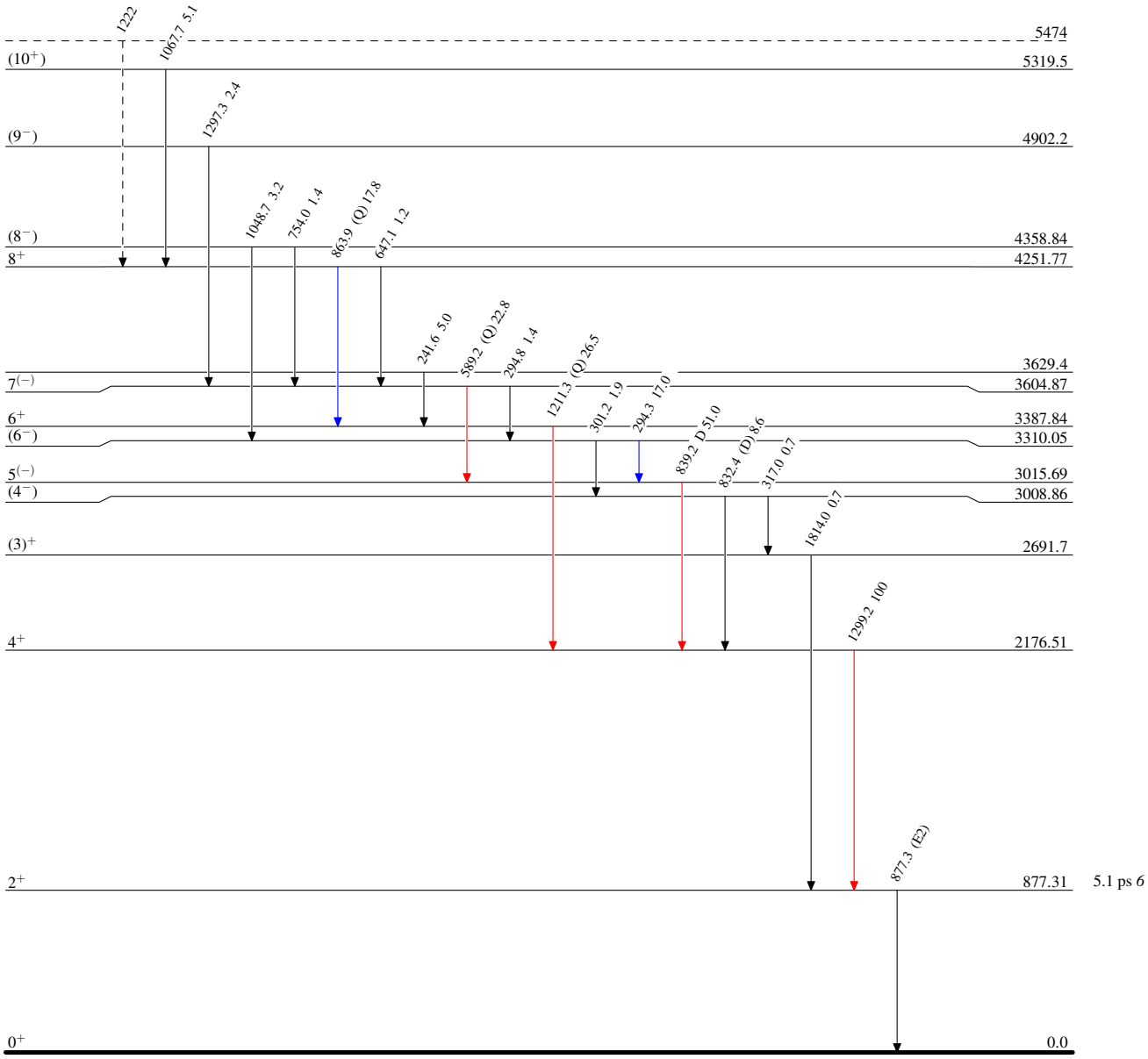
Legend

Level Scheme

Intensities: Relative I_γ

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{62}_{26}Fe_{36}$

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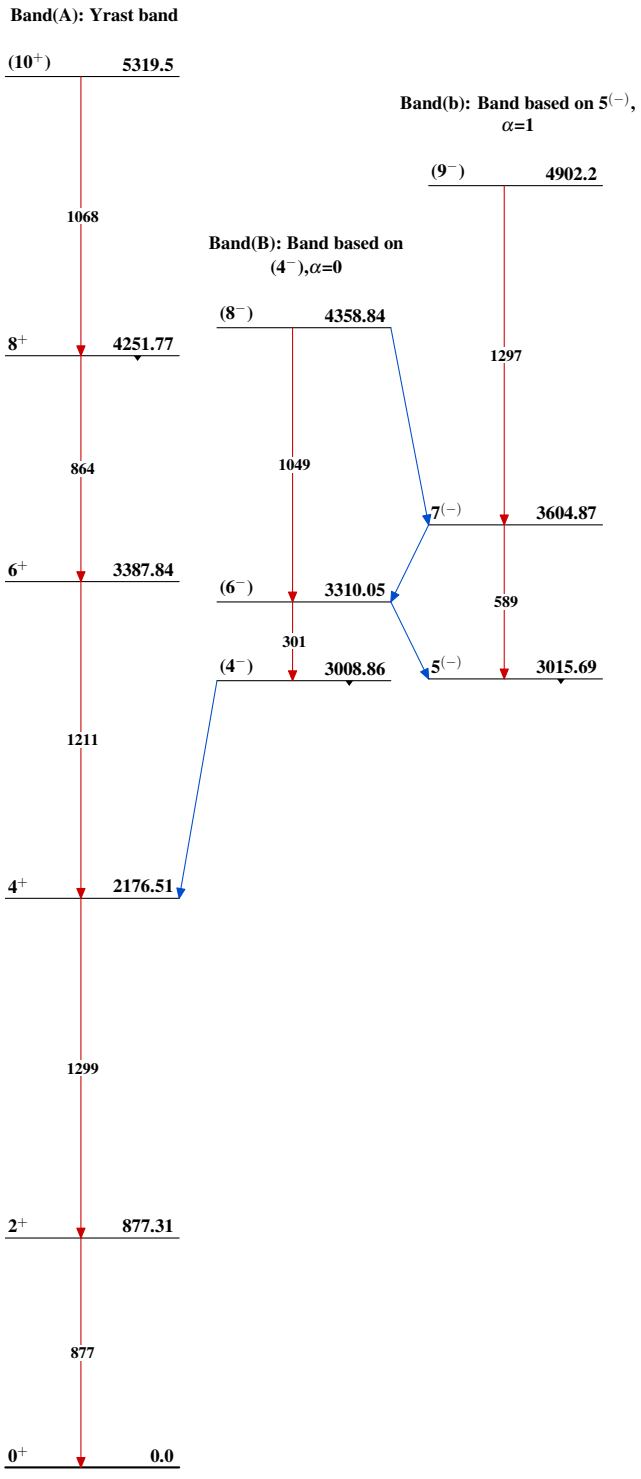

$^{62}_{26}Fe_{36}$