$^{58}\text{Ni}(^{14}\text{N},2p\gamma)$, $^{56}\text{Fe}(^{16}\text{O},np\gamma)$　　**1991Ba43,1978Fi09**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan	NDS 136, 1 (2016)	1-Jul-2016

1991Ba43: $^{58}\text{Ni}(^{14}\text{N},2p\gamma)$ at E(^{14}N)=46 MeV, and $^{56}\text{Fe}(^{16}\text{O},np\gamma)$ at E(^{16}O)= 46-64 MeV. γ-rays were detected using Ge(Li) and intrinsic Ge detectors. Na(Tl) detector was used for delayed coincidences. Measured: Eγ, Iγ, $\gamma(\theta)$, $\gamma(\theta,H)$, $\gamma\gamma$ coin, excitation functions, δ, linear polarization and T$_{1/2}$ (from delayed coincidences).

1978Fi09: $^{69}\text{Ga}(\alpha,3n\gamma)$ at E(α)=30-50 MeV; $^{60}\text{Ni}(^{12}\text{C},np)$ at E(^{12}C) = 50 MeV; $^{63}\text{Cu}(^{10}\text{B},2np)$ at E(^{10}B)=40 MeV; $^{70}\text{Ge}(\alpha,3np\gamma)$, energy was not specified for this reaction. Measured: Eγ, Iγ, $\gamma\gamma$-coincidences, σ(E,Eγ,θ,t), $\gamma(\theta)$. Deduced: T$_{1/2}$ (from time correlation between beam bursts and γ-emission).

1987Be39: $^{56}\text{Fe}(^{16}\text{O},pn\gamma)$ with E(^{16}O)=52 MeV. γ-rays were detected by a planer Ge detector and a NaI(Tl) detector. Measured: T$_{1/2}$ by delayed coincidences.

1997Ga26: $^{58}\text{Ni}(^{16}\text{O},3pn\gamma)$ at E(^{16}O)=70 MeV. γ-rays were measured using 10 Compton-suppressed Ge detectors. Measured: $\gamma\gamma$. Deduced: T$_{1/2}$ for 2733 level and 4075 level using Doppler shift attenuation method. All transitions from levels below the 9$^+$ level are not Doppler shifted.

^{70}As Levels

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[@]	Comments
0.0	4$^+$		J$^{\pi}$: From Adopted Levels.
32.10 *9*	2$^+$		J$^{\pi}$: From Adopted Levels.
166.80 *12*	3$^+$	6.0 ns *5*	
390.2 *3*			
485.50 *17*	4$^-$	4.0 ns *4*	T$_{1/2}$: weighted average of 4.2 ns *4* (1991Ba43) and 3.3 ns *7* (1978Fi09).
566.80 *19*	5$^{(-)}$	<2 ns	
868.9 *3*	6$^{(-)}$		
888.0 *3*	7$^{(-)}$	4.5 ns *3*	g=0.107 *7* (1991Ba43)
			T$_{1/2}$: weighted average of 4.4 ns *1* (1978Fi09) and 5.3 ns *3* (1987Be39,1991Ba43).
			g: From perturbed $\gamma(\theta)$.
898.6[‡] *3*			
933.3[‡] *3*			
1045.9 *3*	6$^{(+)}$		
1454.5 *4*			
1676.3 *3*	8$^+$	<2 ns	
1752.4 *3*	9$^+$	<2 ns	
1809.6[‡] *4*			
2467.6 *9*			
2580.1 *6*	(10$^+$)		J$^{\pi}$: J>9 from the slope of the excitation function for 828γ (1991Ba43).
2733.1 *6*	11$^+$	0.76 ps *21*	T$_{1/2}$: from DSAM in 1997Ga26.
4075.8 *11*		<0.49 ps	T$_{1/2}$: from DSAM in 1997Ga26. Upper limit from effective lifetime of 0.42 ps *7*, not corrected for sidefeeding.

[†] From a least-squares fit to Eγ, by evaluators.

[‡] Observed by 1978Fi09 only.

[#] From multipolarity of γs deduced using $\gamma(\theta)$ and linear polarization in 1991Ba43, unless otherwise stated.

[@] From delayed $\gamma\gamma$ coin (1987Be39,1991Ba43), unless otherwise stated. Both of the references discuss the same work; however, the later values which are slightly different are considered to supersede the former data.

^{58}Ni(^{14}N,2pγ), ^{56}Fe(^{16}O,npγ)   1991Ba43,1978Fi09 (continued)

γ(^{70}As)

E$_\gamma$[†]	I$_\gamma$[#]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[b]	δ[a]	Comments
29.8[‡] 2	10 3	898.6		868.9	6$^{(-)}$			
32.1 1	<1.5	32.10	2$^+$	0.0	4$^+$			
34.7[‡] 2	3 1	933.3		898.6				
57.2[‡] 2	4 2	1809.6		1752.4	9$^+$			
64.5[‡] 2	3 1	933.3		868.9	6$^{(-)}$			
76.1 1	62.8 25	1752.4	9$^+$	1676.3	8$^+$	D(+Q)	0.01 3	Mult.: Other: ΔJ=1 transition from $\gamma(\theta)$ (1978Fi09).
81.3 1	158 8	566.80	5$^{(-)}$	485.50	4$^-$	D+Q	0.08 4	Mult.: Other: ΔJ=1 transition from $\gamma(\theta)$ (1978Fi09).
95.3 3	3.8[@] 7	485.50	4$^-$	390.2				
134.7 1	84 3	166.80	3$^+$	32.10	2$^+$	D(+Q)	−0.01 4	Mult.: Other: ΔJ=1 transition from $\gamma(\theta)$ (1978Fi09).
166.8 3	21[@] 6	166.80	3$^+$	0.0	4$^+$			
221.8 5	7.9 9	1676.3	8$^+$	1454.5				
223.4 5	8.8[@] 9	390.2		166.80	3$^+$			
302.8 5	34.8 20	868.9	6$^{(-)}$	566.80	5$^{(-)}$	(M1+E2)[&]	0.044 23	
318.7 3	103 10	485.50	4$^-$	166.80	3$^+$	E1+M2[&]	−0.041 20	
321.1 3	112 10	888.0	7$^{(-)}$	566.80	5$^{(-)}$	E2+M3[&]	0.04 3	Mult.: Other: Stretched Q from $\gamma(\theta)$ (1978Fi09).
331.7[‡] 2	2 1	898.6		566.80	5$^{(-)}$			
408.5 5	2.8[@]	1454.5		1045.9	6$^{(+)}$			
479.1 2	15.3 9	1045.9	6$^{(+)}$	566.80	5$^{(-)}$	(E1+M2)[&]	−2.9 3	
485.5 2	79 4	485.50	4$^-$	0.0	4$^+$	E1(+M2)[&]	−0.004 15	
566.5 5	5.8 10	1454.5		888.0	7$^{(-)}$			
743.0[‡] 2	13 2	1676.3	8$^+$	933.3		D+Q		Mult.: ΔJ=1 transition from $\gamma(\theta)$ (1978Fi09).
788.3 2	100	1676.3	8$^+$	888.0	7$^{(-)}$	(E1+M2)[&]	0.017 13	
791.3 9	15.0[@] 7	2467.6		1676.3	8$^+$			
827.7 7	15.1[@] 9	2580.1	(10$^+$)	1752.4	9$^+$			
903.8 9	18.3[@] 9	2580.1	(10$^+$)	1676.3	8$^+$			
980.7 5	34 3	2733.1	11$^+$	1752.4	9$^+$	(E2+M3)[&]	−0.06 3	
1342.7 9	19[@] 2	4075.8		2733.1	11$^+$			

[†] From 1991Ba43, unless otherwise stated.
[‡] Observed by 1978Fi09 only.
[#] Relative photon intensity from ^{56}Fe(^{16}O,npγ) at E(^{16}O)=64 MeV (1991Ba43).
[@] From $\gamma\gamma$ coin data (1991Ba43).
[&] From $\gamma(\theta)$ and linear polarization data (1991Ba43).
[a] From $\gamma(\theta)$ (1991Ba43); sign convention not specified by authors.
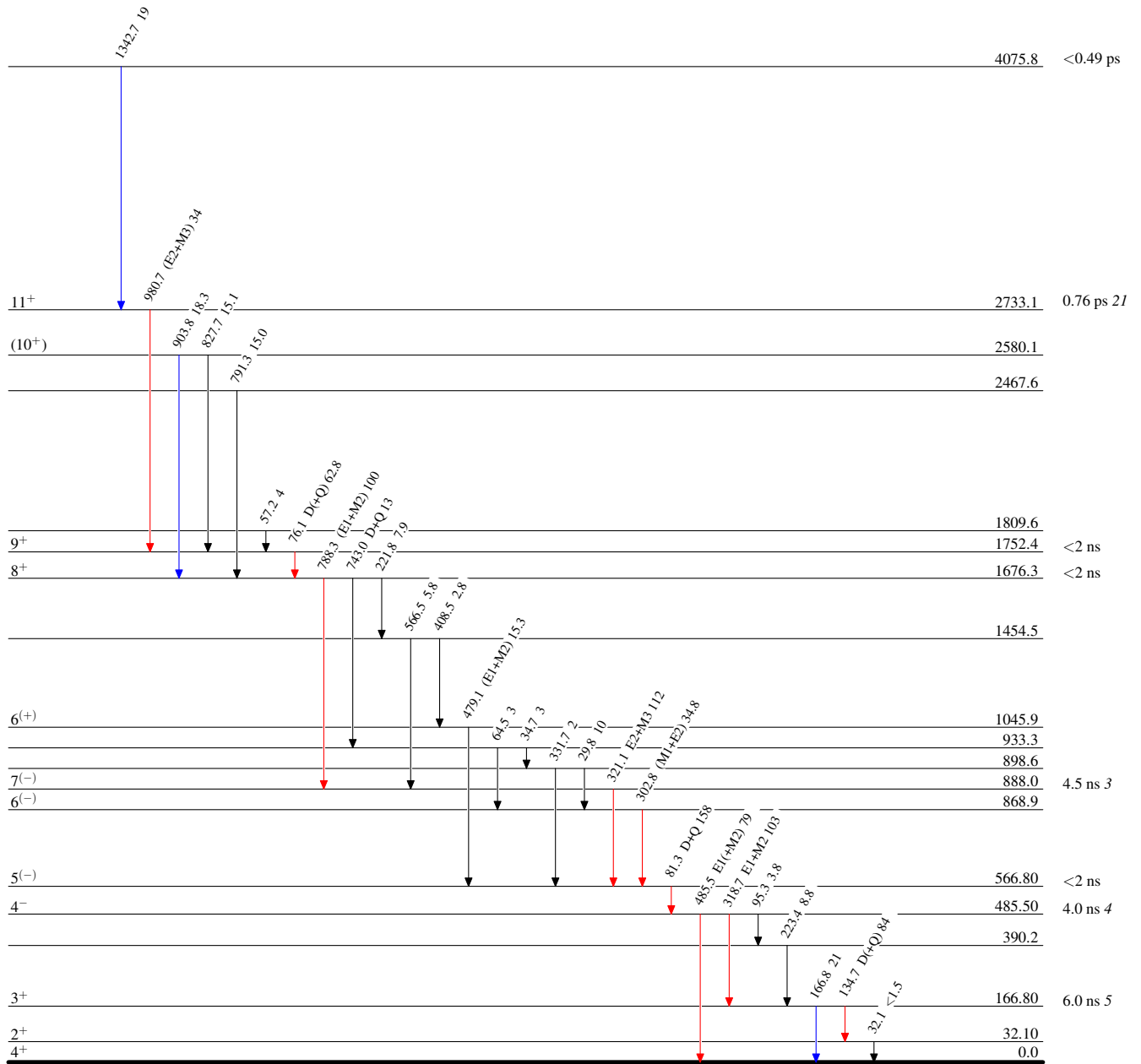[b] From $\gamma(\theta)$ (1991Ba43), unless otherwise stated.

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Level Scheme

Intensities: Relative I$_γ$

Legend

I$_γ$ < 2%×I$_γ^{max}$
I$_γ$ < 10%×I$_γ^{max}$
I$_γ$ > 10%×I$_γ^{max}$

$^{70}_{33}$As$_{37}$