^{28}Si(^{36}Ar,2α2pγ) 1999Ru01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 121, 1 (2014)	20-Jun-2014

E=143 MeV. Measured Eγ, Iγ, $\gamma\gamma$, particle-γ coin, $\gamma(\theta)$, and $\gamma\gamma(\theta)$(DCO) using GAMMASPHERE array with 82 Ge detectors, 4π CsI microball and fifteen liquid scintillators for neutrons.

^{54}Fe Levels

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
0.0	0^+	5482.0 *8*	(5^+)	7565.8 *18*		11093.4 *7*	(13^+)
1407.82 *20*	2^+	5927.4 *5*	7^+	8018.8 *6*	11^+	11113.6 *8*	(12)
2537.44 *23*	4^+	6296.8 *16*	(7^+)	8318.8 *17*	8^-	12043.0 *9*	(13)
2948.64 *25*	6^+	6380.2 *5*	8^+	8374.3 *11*	(10^+)	12314.1 *8*	(14^+)
3294.3 *4*	4^+	6526.2 *5*	10^+	8577.8 *7*	(10^+)	12953.3 *12*	(14^+)
3344.3 *5*	3^+	6551.0 *11*		8808.0 *6*	(11^+)	13358.0 *14*	
4031.1 *5*	5^+	6723.7 *5*	9^+	9123.6 *12*		14388.3 *14*	
4047.6 *6*	4^+	6864.3 *6*	8^+	9845.3 *7*	(12^+)	15062.0? *24*	
4655.4 *7*	5^+	7074.8 *17*		9995.4? *11*			
5045.6 *5*	5^-,6^+	7351.5 *6*	(9^+)	10131.0 *9*	(12^+)		
5280.3 *7*		7503.7 *5*	10^+	10542.0 *7*	(11)		

† From Adopted Levels.

γ(^{54}Fe)

DCO ratios (E2 gated) and A_2's are for 30°−83° arrangement. See 1999Ru01 for additional DCO's for 30°−53° and 53°−83° geometries.

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.†	δ	Comments
145.9 *2*	27 *1*	6526.2	10^+	6380.2	8^+	Q		DCO=1.05 11.
197.4 *2*	18 *1*	6723.7	9^+	6526.2	10^+	D(+Q)	−0.07 *6*	DCO=0.60 11.
411.2 *1*	72 *2*	2948.64	6^+	2537.44	4^+	Q		DCO=0.95 5.
487.2 *2*	4.2 *5*	7351.5	(9^+)	6864.3	8^+	D(+Q)	−0.01 *7*	DCO=0.53 6.
559 *1*	0.4 *1*	8577.8	(10^+)	8018.8	11^+			
571.5 *4*	2.8 *2*	11113.6	(12)	10542.0	(11)	D+Q		A_2=0.54 4.
608 *1*	0.3 *1*	4655.4	5^+	4047.6	4^+			
625.0 *6*	0.4 *1*	5280.3		4655.4	5^+			A_2=0.82 16.
703.6 *6*	1.2 *2*	4047.6	4^+	3344.3	3^+	D+Q		A_2=0.47 7.
736.8 *4*	7.5 *5*	4031.1	5^+	3294.3	4^+	D+Q	+0.14 *+10−7*	DCO=0.49 6.
753 *1*	0.5 *2*	8318.8	8^-	7565.8				
756.8 *4*	12 *1*	3294.3	4^+	2537.44	4^+	(D+Q)		−1.2<MR<−0.05. ΔJ=(0) from DCO=1.07 10.
778 *1*	0.4 *2*	7074.8		6296.8	(7^+)			
780.0 *2*	16 *1*	7503.7	10^+	6723.7	9^+	D(+Q)	+0.06 *6*	DCO=0.69 8. DCO=1.10 8 (M1 gated).
788.8 *6*	0.6 *1*	8808.0	(11^+)	8018.8	11^+			
796.4 *2*	5.0 *3*	6723.7	9^+	5927.4	7^+	Q		DCO=1.11 12.
806.9 *4*	1.0 *2*	3344.3	3^+	2537.44	4^+	(D+Q)		DCO=0.79 44.
881.9 *3*	2.2 *3*	5927.4	7^+	5045.6	5^-,6^+	D(+Q)	+0.07 *+11−8*	DCO=0.56 9.
929.4 *4*	4.5 *4*	12043.0	(13)	11113.6	(12)	D+Q		A_2=0.79 9.
936.9 *5*	3.6 *4*	6864.3	8^+	5927.4	7^+	D(+Q)	−0.09 *12*	DCO=0.71 9.
971.6 *6*	1.0 *3*	7351.5	(9^+)	6380.2	8^+			
978 *1*	2.4 *3*	7503.7	10^+	6526.2	10^+			
1015.0 *5*	0.9 *2*	5045.6	5^-,6^+	4031.1	5^+			DCO=0.67 21.

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^{28}Si(^{36}Ar,2α2pγ) 1999Ru01 (continued)

γ(^{54}Fe) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ	Comments
1037.2 *4*	4.1 *8*	9845.3	(12$^+$)	8808.0	(11$^+$)	D+Q		DCO=0.90 25 (M1 gated).
1069 *1*	0.2 *1*	6551.0		5482.0	(5$^+$)			
1118[‡] *1*	0.3 *1*	11113.6	(12)	9995.4?				
1129.6 *1*	98 *3*	2537.44	4$^+$	1407.82	2$^+$	Q		DCO=1.02 5.
1148[‡] *1*	0.3 *1*	7074.8		5927.4	7$^+$			
1220.7 *4*	13 *1*	12314.1	(14$^+$)	11093.4	(13$^+$)	D+Q		DCO=1.01 15 (M1 gated).
1226.2 *5*	2.1 *3*	8577.8	(10$^+$)	7351.5	(9$^+$)	D+Q		DCO=0.76 22.
1248.1 *3*	32 *1*	11093.4	(13$^+$)	9845.3	(12$^+$)	D+Q		DCO=1.15 24 (M1 gated).
1249 *1*	1.4 *3*	5280.3		4031.1	5$^+$			DCO=0.62 15.
1304.5 *4*	7.0 *9*	8808.0	(11$^+$)	7503.7	10$^+$	D(+Q)	+0.03 *+11−7*	DCO=0.76 16.
1315 *1*	1.8 *3*	13358.0		12043.0	(13)			
1323 *1*	2.2 *3*	10131.0	(12$^+$)	8808.0	(11$^+$)			A_2=1.05 7.
1361 *1*	2.5 *5*	4655.4	5$^+$	3294.3	4$^+$	D+Q		DCO=0.63 17.
1407.8 *2*	100 *3*	1407.82	2$^+$	0.0	0$^+$	Q		DCO=1.02 5.
1423.8 *6*	2.8 *4*	7351.5	(9$^+$)	5927.4	7$^+$	(Q)		DCO=1.06 18.
1435 *1*	0.3 *1*	5482.0	(5$^+$)	4047.6	4$^+$			
1435 *1*	0.2 *1*	14388.3		12953.3	(14$^+$)			
1492.4 *4*	21 *1*	8018.8	11$^+$	6526.2	10$^+$	D(+Q)	−0.02 *+14−12*	DCO=0.72 24. DCO=0.82 11 (M1 gated).
1494 *1*	1.5 *3*	4031.1	5$^+$	2537.44	4$^+$			
1704[‡] *2*	0.3 *1*	15062.0?		13358.0				
1734 *1*	0.8 *2*	10542.0	(11)	8808.0	(11$^+$)			
1769[‡] *2*	0.2 *1*	8318.8	8$^-$	6551.0				
1772 *1*	0.8 *2*	9123.6		7351.5	(9$^+$)			
1819 *1*	0.8 *2*	6864.3	8$^+$	5045.6	5$^-$,6$^+$			
1826.4 *7*	18 *1*	9845.3	(12$^+$)	8018.8	11$^+$	D+Q		DCO=1.08 16 (M1 gated).
1860 *1*	2.2 *4*	12953.3	(14$^+$)	11093.4	(13$^+$)	D+Q		A_2=0.81 9.
1887 *1*	3.5 *2*	3294.3	4$^+$	1407.82	2$^+$			
1895 *1*	0.5 *2*	5927.4	7$^+$	4031.1	5$^+$			
1937 *2*	1.0 *2*	3344.3	3$^+$	1407.82	2$^+$			
1964 *1*	0.3 *1*	10542.0	(11)	8577.8	(10$^+$)			
1986 *2*	1.6 *4*	5280.3		3294.3	4$^+$			
1994 *1*	2.0 *5*	8374.3	(10$^+$)	6380.2	8$^+$	(Q)		DCO=1.27 22.
2022 *1*	0.2 *1*	8318.8	8$^-$	6296.8	(7$^+$)			
2074 *2*	2.5 *5*	14388.3		12314.1	(14$^+$)			A_2=1.41 10.
2097 *1*	4.4 *6*	5045.6	5$^-$,6$^+$	2948.64	6$^+$	(D+Q)	≈−1.0	ΔJ=(0) from DCO=1.13 15.
2112 *1*	1.0 *2*	10131.0	(12$^+$)	8018.8	11$^+$			A_2=1.49 22.
2183[‡] *2*	0.2 *1*	12314.1	(14$^+$)	10131.0	(12$^+$)			
2282 *2*	5 *1*	8808.0	(11$^+$)	6526.2	10$^+$			
2306 *2*	1.5 *3*	11113.6	(12)	8808.0	(11$^+$)	D		ΔJ=(1) from A_2=0.74 6.
2332 *2*	0.6 *2*	5280.3		2948.64	6$^+$			
2342 *2*	0.4 *1*	9845.3	(12$^+$)	7503.7	10$^+$			
2492[‡] *2*	0.3 *1*	9995.4?		7503.7	10$^+$			
2523 *2*	0.4 *1*	10542.0	(11)	8018.8	11$^+$			
2640 *2*	1.0 *2*	4047.6	4$^+$	1407.82	2$^+$			
2944 *1*	2.6 *4*	5482.0	(5$^+$)	2537.44	4$^+$	(D+Q)	≈−0.3	DCO=0.73 19.
2979 *1*	11 *1*	5927.4	7$^+$	2948.64	6$^+$	D+Q	≈−1.0	DCO=1.31 14.
3037 *2*	0.4 *1*	10542.0	(11)	7503.7	10$^+$			
3074 *2*	2.8 *3*	11093.4	(13$^+$)	8018.8	11$^+$			
3095 *3*	0.9 *2*	11113.6	(12)	8018.8	11$^+$			
3270[‡] *3*	0.3 *1*	9995.4?		6723.7	9$^+$			
3319 *2*	10 *1*	9845.3	(12$^+$)	6526.2	10$^+$			A_2=1.18 11.
3348 *2*	2.7 *3*	6296.8	(7$^+$)	2948.64	6$^+$			DCO<1.
3431.2 *5*	29 *1*	6380.2	8$^+$	2948.64	6$^+$	Q		DCO=1.01 11.
3578 *2*	0.5 *1*	6526.2	10$^+$	2948.64	6$^+$	E4		Mult.: from ^{40}Ca(^{16}O,2pγ), based on a

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^{28}Si(^{36}Ar,2α2pγ) 1999Ru01 (continued)

γ(^{54}Fe) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
							pulsed-beam search revealed a weak 10^+ to 6^+ E4 cross-over transition, see 1978NoZY.
3602 *2*	0.5 *2*	6551.0		2948.64	6^+		
3915 *2*	3.0 *3*	6864.3	8^+	2948.64	6^+	(Q)	DCO=1.21 21.
4016 *1*	1.2 *2*	10542.0	(11)	6526.2	10^+		
4126 *3*	0.9 *2*	7074.8		2948.64	6^+		
4617 *3*	0.8 *2*	7565.8		2948.64	6^+		

[†] From DCO ratio.
[‡] Placement of transition in the level scheme is uncertain.

^{28}Si(^{36}Ar,2α2pγ) 1999Ru01

Level Scheme

Intensities: Relative I_γ

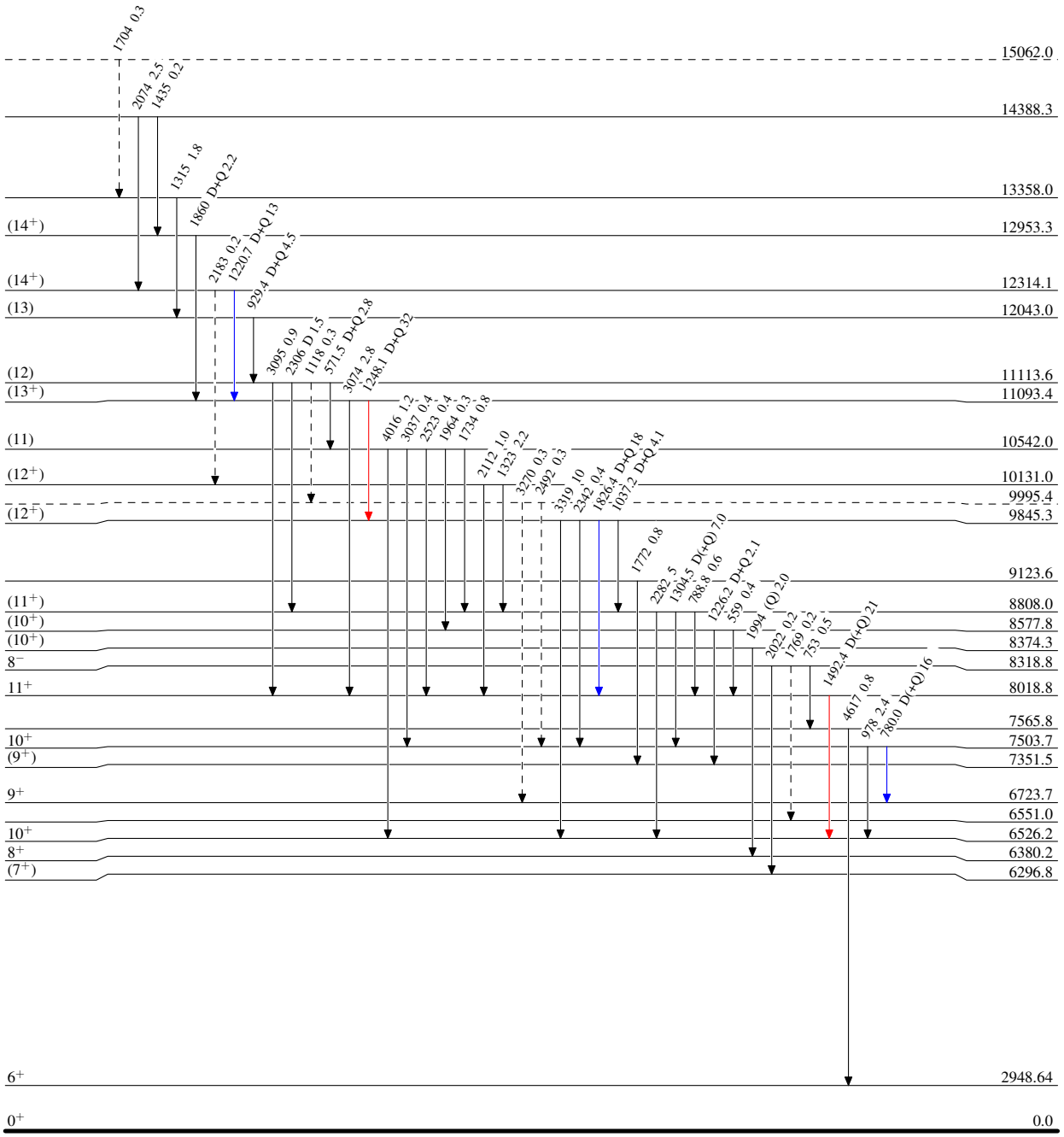
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{54}_{26}Fe_{28}$

^{28}Si(^{36}Ar,2α2pγ) 1999Ru01

Level Scheme (continued)

Intensities: Relative I_γ

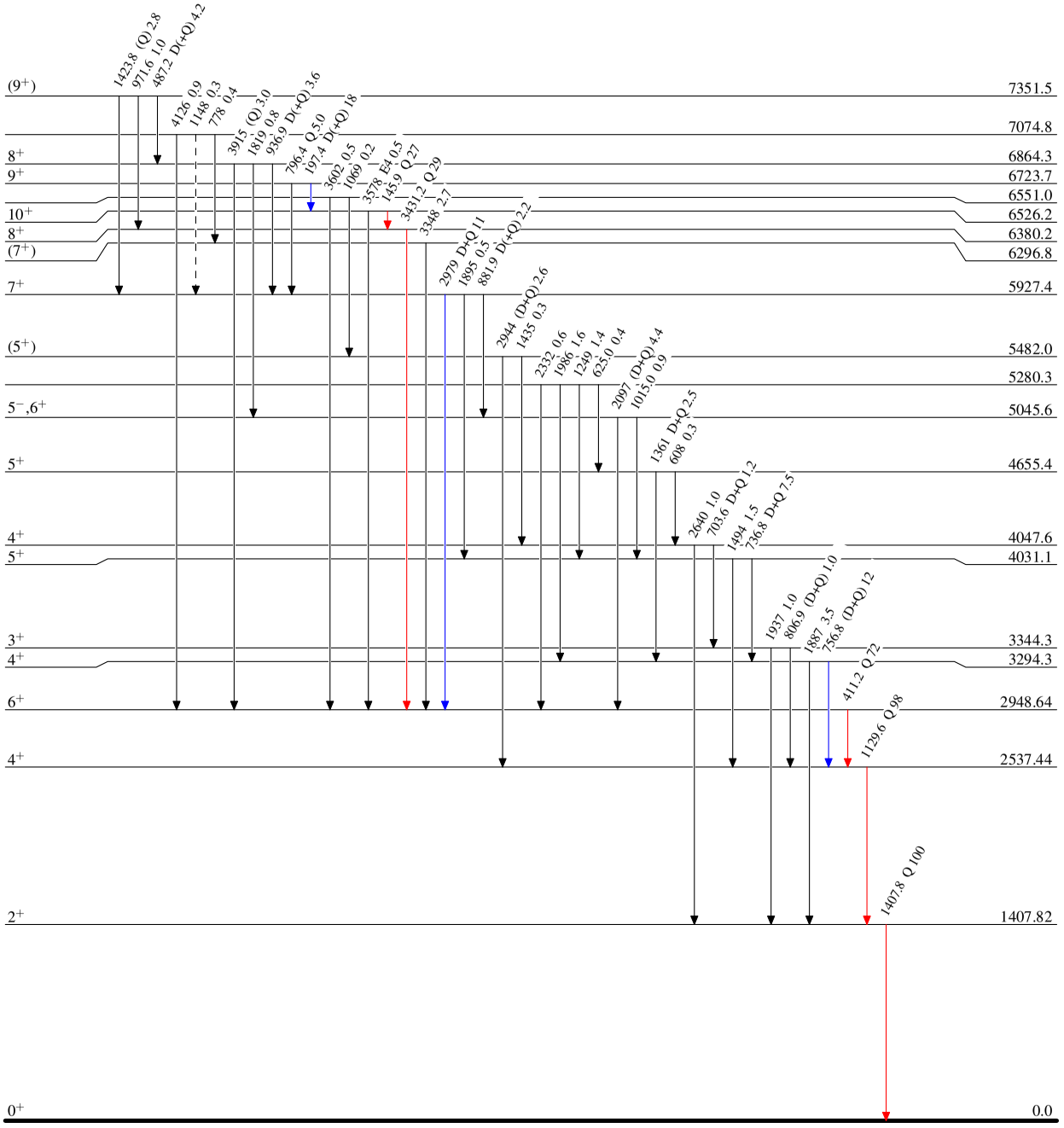
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{54}_{26}Fe_{28}$