^{64}Ni(^{12}C,α2nγ) 2016Ra08

History

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

2016Ra08: E(^{12}C)=55 MeV beam provided by the 15 UD Pelletron accelerator at the Inter-University Accelerator Centre, New Delhi. Target consisted of isotopically enriched ^{64}Ni with thickness ≈1.5 mg/cm^2 on a 7 mg/cm^2 Au backing. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using the Gamma Detector Array (GDA) consisting of 12 Compton-suppressed n-type HPGe detectors.

^{70}Ge Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0#	0+	3295.1# *12*	6+	5240.5# *17*	10+	8244.0@ *24*	16+
1039.2# *8*	2+	3668.0& *14*	(5+)	5538.0@ *17*	10+	9422@ *3*	18+
1706.8& *8*	2+	3751.8& *13*	6+	6714.5# *20*	12+	10268@ *3*	(20+)
2152.1# *11*	4+	4201.5# *14*	8+	6778.0@ *20*	12+		
2450.0& *10*	3+	4429.0@ *14*	8+	7618.0@ *22*	14+		
2805.0& *11*	4+	4818.8& *16*	(8+)	7765.5# *22*	14+		

† From least-squares fit to Eγ, by evaluators, assuming ΔEγ=1 keV.
‡ As given in 2016Ra08; J from R(DCO) and band assignments, while parity are assigned based on literature and systematics.
# Band(A): g.s. band.
@ Band(a): Side band based on 8+.
& Band(B): Band based on 2+.

γ(^{70}Ge)

R(DCO) defined as Iγ(50° or 144° gated by γ at 98°)/Iγ(98° gated by γ at 50° or 144°). 2016Ra08 use only ΔJ=2 transitions as gating transitions where expected R(DCO) ratios are ≈1 for pure quadrupole transitions and 0.5 for pure dipole transitions.

Eγ	Iγ†	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	Comments
450	1.5 *3*	4201.5	8+	3751.8	6+		
490	0.8 *2*	3295.1	6+	2805.0	4+		
626	8.9 *11*	8244.0	16+	7618.0	14+	Q	Mult.: R(DCO)=1.17 *22* (2016Ra08).
653	1.2 *4*	2805.0	4+	2152.1	4+		
667	11.9 *6*	1706.8	2+	1039.2	2+	Q	Mult.: R(DCO)=0.94 *7*. 2016Ra08 state this is ΔJ=0, Q transition.
677	1.0 *3*	4429.0	8+	3751.8	6+	(Q)	
743	3.4 *3*	2450.0	3+	1706.8	2+	D	Mult.: R(DCO)=0.72 *13* (2016Ra08).
840	10.8 *10*	7618.0	14+	6778.0	12+	Q	Mult.: R(DCO)=1.09 *18* (2016Ra08).
846	2.2 *8*	10268	(20+)	9422	18+		
906	51.1 *12*	4201.5	8+	3295.1	6+	Q	Mult.: R(DCO)=0.99 *7* (2016Ra08).
947	6.9 *5*	3751.8	6+	2805.0	4+	Q	Mult.: R(DCO)=1.01 *3* (2016Ra08).
1039‡	183.4‡ *9*	1039.2	2+	0.0	0+	Q	Mult.: R(DCO)=1.01 *5* (2016Ra08).
1039‡	24.8‡ *9*	5240.5	10+	4201.5	8+	Q	Mult.: R(DCO)=1.12 *11* (2016Ra08).
1051	11.7 *14*	7765.5	14+	6714.5	12+	Q	Mult.: R(DCO)=1.17 *12* (2016Ra08).
1067	3.3 *5*	4818.8	(8+)	3751.8	6+		
1098	9.3 *7*	2805.0	4+	1706.8	2+	Q	Mult.: R(DCO)=1.19 *10* (2016Ra08).
1109	23.1 *12*	5538.0	10+	4429.0	8+	Q	Mult.: R(DCO)=0.98 *12* (2016Ra08).
1113	134.9 *9*	2152.1	4+	1039.2	2+	Q	Mult.: R(DCO)=1.05 *6* (2016Ra08).
1134	29.5 *9*	4429.0	8+	3295.1	6+	Q	Mult.: R(DCO)=1.01 *9* (2016Ra08).
1143	100	3295.1	6+	2152.1	4+		

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^{64}Ni(^{12}C,α2nγ) 2016Ra08 (continued)

γ(^{70}Ge) (continued)

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
1178	4.3 *9*	9422	18^+	8244.0	16^+	Q	Mult.: R(DCO)=0.94 *25* (2016Ra08).
1218	1.5 *4*	3668.0	(5^+)	2450.0	3^+		
1240	14.1 *11*	6778.0	12^+	5538.0	10^+	Q	Mult.: R(DCO)=1.08 *15* (2016Ra08).
1411	3.4 *4*	2450.0	3^+	1039.2	2^+		
1474	14.7 *11*	6714.5	12^+	5240.5	10^+	Q	Mult.: R(DCO)=1.13 *12* (2016Ra08).
1707	4.7 *5*	1706.8	2^+	0.0	0^+		

† Relative intensities normalized to Iγ(1143γ)=100.
‡ Multiply placed with intensity suitably divided.

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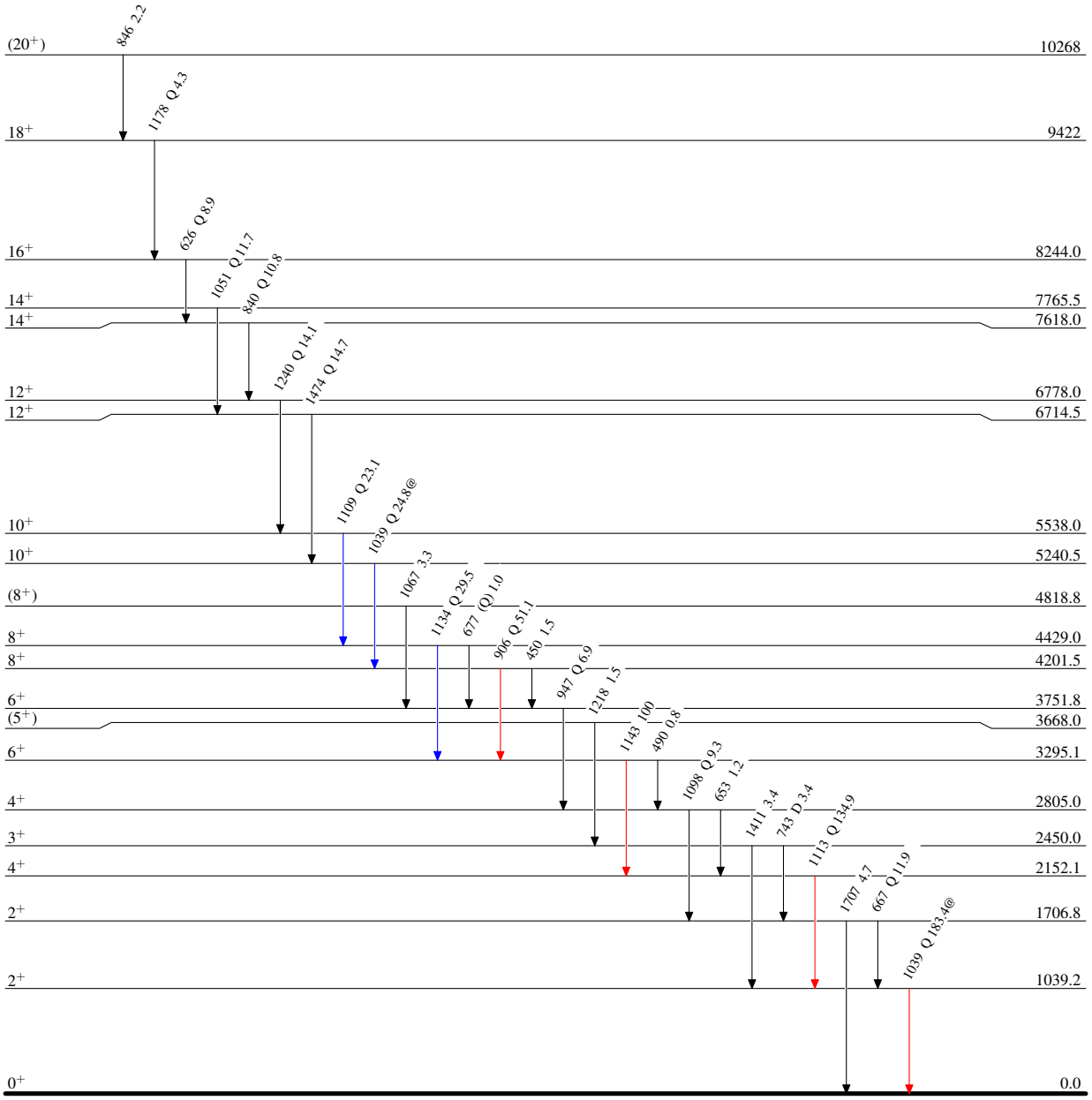
Level Scheme

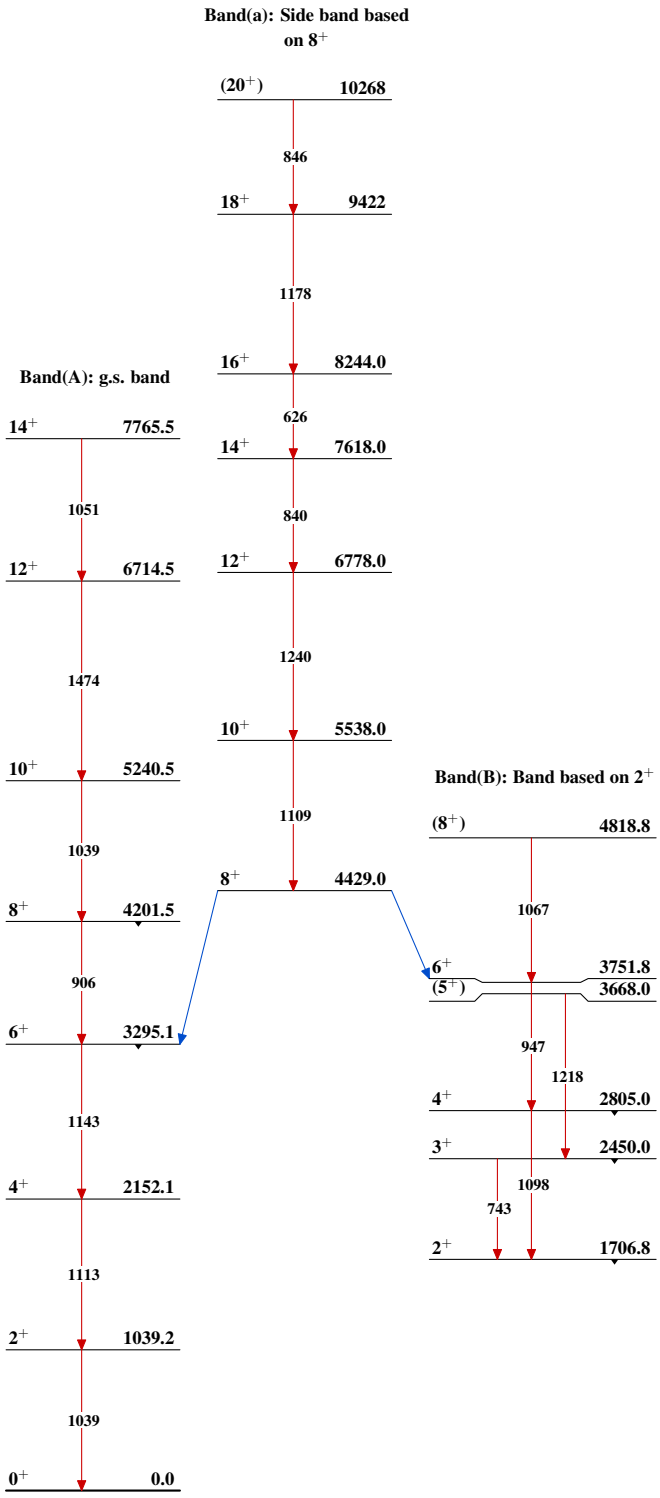
Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{70}_{32}Ge_{38}$

$^{64}Ni(^{12}C,\alpha 2n\gamma)$ 2016Ra08



$^{70}_{32}Ge_{38}$