64 Ni(12 C,2n γ), 60 Ni(16 O,2p γ) 1979Pi05,1977PiZR

History				
Туре	Author	Citation	Literature Cutoff Date	
Full Evaluation	Balraj Singh, Ameenah R. Farhan	NDS 107, 1923 (2006)	30-Apr-2006	

⁷⁴Se Levels

Includes reaction: ${}^{65}Cu({}^{11}B,2n\gamma)$.

1979Pi05 (also 1977PiZR,1976Pi07): ⁶⁰Ni(¹⁶O,2p γ) E=45 MeV; ⁶⁴Ni(¹²C,2n γ) E=39 MeV; ⁶⁵Cu(¹¹B,2n γ) E=29 MeV. Measured γ , $\gamma(\theta)$, $\gamma\gamma(\theta)$.

E(level) [#]	$J^{\pi \dagger}$	T _{1/2} ‡	E(level) [#]	$J^{\pi \dagger}$	$T_{1/2}^{\ddagger}$
$0.0^{@}$	0^{+}		3111.8 4	$(2^+, 3, 4^+)$	
634.82 [@] 8	2+		3198.44 [@] 17	8+	0.55 ps 7
854.04 14	0^{+}		3251.0 5		
1269.15 ^a 8	2^{+}		3253.5 5		
1363.24 [@] 10	4+		3382.58 ^c 18		
1657.44 17			3516.10 ^b 19	7-	3.5 ps 14
1838.84 24	(2^{+})		3525.5 ^{&} 4	(7^{+})	0.49 ps 21
1884.36 ^{&} 10	3+		3674.08 23		
2108.12 ^a 10	4+		3841.94 25		
2231.45 [@] 13	6+	1.66 ps 21	4198.2 ^c 3		
2314.16 14	(2^{+})		4256.34 [@] 19	10^{+}	0.37 ps 7
2349.70 ^b 12	3-		4403.34 <mark>b</mark> 25	9-	0.49 ps 14
2563.52 11	$(2^+, 3, 4^+)$		4441.1 <i>4</i>		-
2662.05 ^{&} 15	5+		4450.0 ^{&} 4	(9 ⁺)	0.42 ps 14
2818.46 23			4496.06 23		
2831.52 [°] 17			5206.2 [°] 11		
2842.72 ^b 12	5-		5443.0 [@] 5	(12^{+})	0.21 ps 10
2918.29 19	$(2^+, 3, 4^+)$		5492.1 ^b 4	(11 ⁻)	0.28 ps 4
2986.81 ^{<i>a</i>} 15	(6 ⁺)		6685.6 ^b 8	(13 ⁻)	
3078.16 23			6735.4 [@] 10	(14^{+})	0.24 ps 10

[†] As proposed by 1979Pi05 based on $\gamma(\theta)$ data and band assignments. The assignments are the same in 'Adopted Levels', except that some are given without parentheses there.

[±] From DSA method (1979Pi05,1976Pi07).

[#] From least-squares fit to $E\gamma's$.

[@] Band(A): g.s. band.

- & Band(B): 3^+ band.
- ^a Band(C): 2⁺ band.

^{*b*} Band(D): 3^- band.

^c Band(E): γ sequence.

$\gamma(^{74}\text{Se})$

 $\gamma(\theta)$ and $\gamma\gamma(\theta)$ data are from 1979Pi05: ratio In 1979Pi05 is for 0° and 90°.

$ \frac{\gamma(^{74}\text{Se}) \text{ (continued)}}{Mult.} \underbrace{P_{\gamma}^{\dagger}}{219.35 15} = \underbrace{I_{\gamma}^{\ddagger}}{5.9 2} = \underbrace{E_{i}(\text{level})}{854.04} \underbrace{J_{i}^{\pi}}{0^{+}} = \underbrace{E_{f}}{634.82} \underbrace{J_{f}^{\pi}}{2^{+}} = \underbrace{Mult.} \underbrace{Q}{0} = \underbrace{\delta}{2} = \underbrace{Commen}{493.01 10} = \underbrace{I_{4} I}{14 I} = \underbrace{I_{4} I}{2842.72} \underbrace{I_{5}^{-}}{2349.70} \underbrace{I_{5}^{\pi}}{3^{-}} = \underbrace{I_{4} I}{2349.70} \underbrace{I_{4} I}{3^{-}} = \underbrace{I_{4} I}{10} \underbrace{I_{4} I}{10} \underbrace{I_{4} I}{10} = \underbrace{I_{4} I}{10} $							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	γ ⁽⁷⁴ Se) (continued)						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	ts						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	56 <i>13.</i>).40 <i>6</i>						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
$(24.27.15, 0.0, 0.12(0.15, 0^{+}, (24.92, 0^{+})))$	$_{1}=-0.03 \ 10.$						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	00 <i>11</i> .						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	05 7.						
734.56 <i>15</i> 7.6 <i>3</i> 2842.72 5 ⁻ 2108.12 4 ⁺							
$744.84 15 3.1 2 2108.12 4^{-1} 1365.24 $	í						
797.3 5 0.46 20 3111.8 $(2^+,3,4^+)$ 2314.16 (2^+)	•						
815.6 2 6.7 3 4198.2 3382.58 838.98 10 12.2 4 2108.12 4 ⁺ 1269.15 2 ⁺ Q $A_2 = +0.31$ 3, $\alpha = -0.06$ 3. (839a)(1269a)(4): ratio=1	08 10						
863.4 <i>3</i> 7.2 <i>3</i> 3525.5 (7 ⁺) 2662.05 5 ⁺	.08 10.						
868.21 10 62 2 2231.45 6^+ 1363.24 4^+ E2 $A_2 = +0.31$ 2, $A_4 = -0.09$ 2 (868 γ)(728 γ)(θ): ratio=1.4	03 <i>6</i> .						
8/8.68 10 2.19 8 2986.81 (6^+) 2108.12 4^+ 887.23 15 9.2 4 4403.34 9^- 3516.10 7^- E2 A2=+0.39 6, A4=-0.14 6 (8872)(6732+4932)(4): rs rs (6732+4932)(4): rs	$\frac{1}{10}$						
924.53 15 4.7 3 4450.0 (9^+) 3525.5 (7^+)							
966.98 10 37 2 3198.44 8 ⁺ 2231.45 6 ⁺ E2 $A_2 = +0.43 5, A_4 = -0.08 5$ (967 γ)(868 γ +728 γ)(θ): ra							
984.73 0.8920 1838.84 (2^+) 854.04 0^+ 986.52 3.11 2349.70 $3^ 1363.24$ 4^+ 1008.0 2.5 5206.2 4198.2							
1022.61 15 $0.97^{\#}$ 10 1657.44 634.82 2 ⁺							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	'. γ)(θ):						
$1080.4\ 2$ 2.1 2 2349.70 3 ⁻ 1269.15 2 ⁺							
1088.8 2 7.6 7 5492.1 (11 ⁻) 4403.34 9 ⁻ E2 $A_2 = +0.34 I4, A_4 = -0.21$ (1089 γ)(887 γ +673 γ +493 γ) ratio=1.14 31 (1977Pi7	4. $\gamma)(\theta)$:						
1151.0 2 2.8 2 3382.58 2231.45 6 ⁺	<i></i>						
1186.7 4 12.6 20 5443.0 (12^+) 4256.34 10^+ E2 A ₂ =+0.29 8, A ₄ =-0.11 8 1193.4 7 6.5 10 6685.6 (13^-) 5492.1 (11^-)) .						
1200.30 15 $2.82^{\#}$ 13 2563.52 $(2^+,3,4^+)$ 1363.24 4^+							
1204.1 3 $1.14^{\#}$ 11 1838.84 (2 ⁺) 634.82 2 ⁺							
1249.52 <i>10</i> 2.3 2 1884.36 3 ⁺ 634.82 2 ⁺							
$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
$1272.5 \circ 5.2 \circ 5.2 \circ 5.4 (14) \circ 544 \circ 0 (12)$ $1294 4 1 = 1.34^{\#} 16 - 2563.52 \cdot (2^+, 3.4^+) = 1269.15 \cdot 2^+$							

Continued on next page (footnotes at end of table)

			⁶⁴ Ni(¹² C,2n	γ), ⁶⁰ Ni(¹⁶	O,2 p	γ) 1979	Pi05,1977PiZR (continued)
					$\gamma(^{74}$	Se) (contin	ued)
E_{γ}^{\dagger}	I_{γ}^{\ddagger}	E _i (level)	\mathbf{J}_i^{π}	E_f	\mathbf{J}_{f}^{π}	Mult. [@]	Comments
1298.9 2	1.6 5	2662.05	5+	1363.24	4^{+}		
1366.6 4	1.15 [#] 10	3251.0		1884.36	3+		
1455.2 2	1.94 [#] 11	2818.46		1363.24	4+		
1460.26 15	1.33 [#] 11	2314.16	(2^{+})	854.04	0^+		
1468.33 15	3.8 5	2831.52		1363.24	4^{+}		
1473.27 15	2.2 6	2108.12	4+	634.82	2+		
1479.44 15	3.9 3	2842.72	5-	1363.24	4+		
1649.2 <i>3</i>	0.37 [#] 10	2918.29	$(2^+, 3, 4^+)$	1269.15	2^{+}		
1679.3 2	0.75 [#] 10	2314.16	(2^{+})	634.82	2^{+}		
1714.9 ^{&} 2	3.0 ^{&} 3	2349.70	3-	634.82	2+	D	$A_2 = -0.30 4$, $A_4 = 0.02 4$ for the doublet. $\delta(Q/D) = -0.08 8$ or $+0.02 5$.
1714.9 <mark>&</mark> 2	1.5 ^{&} 3	3078.16		1363.24	4+		
1842.9 4	0.12 [#] 10	3111.8	$(2^+, 3, 4^+)$	1269.15	2^{+}		
1890.2 4	0.8 2	3253.5		1363.24	4+		
1928.8 5	0.52 [#] 10	2563.52	$(2^+, 3, 4^+)$	634.82	2^{+}		
2283.4 2	2.23 [#] 12	2918.29	$(2^+, 3, 4^+)$	634.82	2^{+}		
2310.8 2	2.02 [#] 11	3674.08		1363.24	4+		
2332.9 3	0.6 [#] 1	4441.1		2108.12	4+		
2387.9 2	0.9 [#] 1	4496.06		2108.12	4+		

[†] From ⁶⁴Ni(¹²C,2n γ) E=39 MeV (1979PiZR), unless otherwise stated. [‡] From ⁶⁴Ni(¹²C,2n γ) (1977PiZR), unless otherwise stated. [#] From ⁶⁰Ni(¹⁶O,2p γ) (1977PiZR).

^(a) From $\gamma(\theta)$ and $\gamma\gamma(\theta)$ data; RUL used when lifetimes are known. [&] Multiply placed with intensity suitably divided.

⁶⁴Ni(¹²C,2nγ),⁶⁰Ni(¹⁶O,2pγ) 1979Pi05,1977PiZR



64 Ni(12 C,2n γ), 60 Ni(16 O,2p γ) 1979Pi05,1977PiZR





⁶⁴Ni(¹²C,2nγ),⁶⁰Ni(¹⁶O,2pγ) 1979Pi05,1977PiZR



 $^{74}_{34}{
m Se}_{40}$





⁷⁴₃₄Se₄₀