### <sup>50</sup>Cr(<sup>12</sup>C,2pnγ) **1976Pi05**

History							
Туре	Author	Citation	Literature Cutoff Date				
Full Evaluation	M. Shamsuzzoha Basunia	NDS 151, 1 (2018)	1-Apr-2018				

 $E(^{12}C)=26-58$  MeV. Measured E $\gamma$ , I $\gamma$ , excit,  $\gamma\gamma$  coin,  $\gamma(\theta)$ , directional correlation of oriented nuclei (DCO) ratios ( $\theta=0^{\circ}$  and 90°); semi, enriched target (1976Pi05).

See 1976Pi05 for detailed DCO ratio data.

# <sup>59</sup>Ni Levels

E(level)	$J^{\pi}$	E(level)	$J^{\pi}$	E(level)	$J^{\pi}$	E(level)	$J^{\pi \dagger}$
0.0 339.37 8 465.1 <i>1</i> 877.8 <i>3</i> 1189.0 <i>3</i>	3/2 <sup>-</sup> 5/2 <sup>-</sup>	1337.85 8 1739.19 22 1767.40 10 1949.1 6 2535.50 24	7/2 <sup>-</sup> 9/2 <sup>-</sup> 13/2	2704.91 <i>12</i> 3376.75 <i>15</i> 3559.21 <i>20</i> 4140.99 <i>17</i> 4455.4 <i>6</i>	11/2 13/2 13/2	4947.19 20 5251.7 6	15/2 (13/2,15/2)

<sup>†</sup> Assumed for mult and  $\delta$ . For  $J^{\pi}$  determinations, see Adopted Levels:  $J^{\pi}$  assignments.

# $\gamma$ (<sup>59</sup>Ni)

$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E <sub>i</sub> (level)	$\mathrm{J}^{\pi}_i$	$E_f$	$\mathbf{J}_f^{\pi}$	Mult. <sup>#</sup>	$\delta^{@}$	Comments
339.4 1	100	339.37	5/2-	0.0	3/2-	D+Q	-0.11 4	A <sub>2</sub> =-0.18 2, A <sub>4</sub> =+0.20 10; DCO(1400γ,339γ)=0.47 5, DCO(1428γ,339γ)=0.50 5. δ: -2.5 5 also possible from $\gamma(\theta)$ but excluded on basis of measured DCO ratio.
429.6 1	≤5	1767.40		1337.85	7/2-			
465.1 <i>1</i>	9	465.1		0.0	3/2-			$I_{\gamma}$ : multiple line.
581.8 <sup>&amp;</sup> 1 671.8 1	35 4	4140.99 3376.75	13/2	3559.21 2704.91	11/2			I <sub><math>\gamma</math></sub> : multiple line; <sup>12</sup> C( <sup>12</sup> C,2pn $\gamma$ ) contaminant.
764.2 1	17	4140.99	13/2	3376.75	-	D		$A_2 = -0.28 \ 6, \ A_4 = +0.09 \ 7;$ DCO(764 $\gamma$ ,1428 $\gamma$ )=1.94 <i>10</i> , DCO(764 $\gamma$ ,1367 $\gamma$ )=1.8 <i>3</i> ; DCO(764 $\gamma$ ,1610 $\gamma$ )=1.2 <i>3</i> .
796.3 <mark>b</mark> 1	16 <mark>b</mark>	2535.50	13/2	1739.19	$9/2^{-}$	Q		$DCO(796\gamma, 1400\gamma) = 1.04 \ 10.$
796.3 <sup>b</sup> 1	16 <mark>b</mark>	5251.7	(13/2,15/2)	4455.4	13/2			$E_{\gamma}$ : from ( <sup>12</sup> C,2pnγ). DCO(796γ,1367γ)=1.6 3.
806.2 1	13	4947.19	15/2	4140.99	13/2	D(+Q)	<0.1	$A_2 = -0.21$ 9, $A_4 = +0.13$ 10; DCO(806 $\gamma$ , 1428 $\gamma$ )=1.95 20; DCO(806 $\gamma$ , 1610 $\gamma$ )=1.15 20; DCO(806 $\gamma$ , 764 $\gamma$ )=0.93 10.
877.8 <i>3</i>	≤3	877.8		0.0	$3/2^{-}$			
937.5 2	4	2704.91	11/2	1767.40				
998.5 1	40	1337.85	7/2-	339.37	5/2-	Q+D	+9 3	δ: +0.35 5 also possible. $A_2$ =+0.24 8, $A_4$ =+0.30 <i>10</i> ; DCO(1338γ,999γ)=1.10 <i>10</i> ; DCO(999γ,339γ)=0.55 7.
1189.0 <i>3</i>	6	1189.0		0.0	3/2-			
1337.8 <i>1</i>	15	1337.85	7/2-	0.0	3/2-	Q		$A_2 = +0.225, A_4 = -0.075;$ DCO(1367 $\gamma$ ,1338 $\gamma$ )=1.23.
1367.0 <i>1</i>	35	2704.91	11/2	1337.85	7/2-	Q		$A_2 = +0.25 \ 5, \ A_4 = -0.08 \ 8;$ DCO(1367 $\gamma$ .339 $\gamma$ )=0.7 2.
1399.8 2	17	1739.19	9/2-	339.37	$5/2^{-}$	Q		$A_2 = +0.23 I, A_4 = -0.10 2.$
1428.0 <i>1</i>	40	1767.40		339.37	5/2-	Q		$A_2 = +0.22 I$ , $A_4 = -0.04 I$ .

Continued on next page (footnotes at end of table)

#### ${}^{50}$ Cr( ${}^{12}$ C,2pn $\gamma$ ) 1976Pi05 (continued)

# $\gamma$ (<sup>59</sup>Ni) (continued)

$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E <sub>i</sub> (level)	$\mathbf{J}_i^{\pi}$	$E_f$	$\mathbf{J}_{f}^{\pi}$	Mult. <sup>#</sup>	$\delta^{@}$	Comments
1609.5 <sup>b</sup>	16 <mark>b</mark>	1949.1		339.37	5/2-	a		
1609.5 <mark>b</mark> 3	16 <mark>b</mark>	3376.75		1767.40		D <sup>a</sup>		Mult.: from DCO(1610 $\gamma$ ,1428 $\gamma$ )=1.9 3.
1750.5 <i>5</i>	12	4455.4	13/2	2704.91	11/2	D+Q	-0.22 5	δ: -3 + 2 - 1 also possible. $A_2 = -0.44$ 8, $A_4 = +0.33$ 8; DCO(1751γ,1367γ)=1.7 3.
1792.4 <mark>&amp;</mark> 5	10	3559.21		1767.40				
1949.1 6	7	1949.1		0.0	3/2-			

<sup>†</sup> From authors'  ${}^{56}$ Fe( $\alpha$ ,n $\gamma$ ) data, except otherwise noted.

<sup>±</sup> At E=48 MeV and  $\theta$ =55°, normalized so I(339 $\gamma$ )=100.

<sup>#</sup> From  $\gamma(\theta)$  and DCO ratios.

<sup>@</sup> From  $\gamma(\theta)$ .

& Evaluator has reversed order of  $581\gamma$ - $1791\gamma$  cascade; see comment in  $(\alpha,n\gamma)$  dataset.

<sup>*a*</sup>  $A_2 = -0.245$ ,  $A_4 = +0.075$  for doublet. <sup>*b*</sup> Multiply placed with undivided intensity.

