$^{82}\text{Se}(^{19}\text{F},4\text{n}\gamma)$ 2003Bu06

	Type	Author	History Citation	Literature Cutoff Date
	Full Evaluation	N. Nica	NDS 111, 525 (2010)	19-Nov-2009

2003Bu06: E=68 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\nu$ coin, $\gamma(\theta)$, $\gamma\gamma(\theta)$(DCO) using two Ge detectors and NE213 scintillator.

^{97}Tc Levels

E(level)[†]	J$^{\pi}$[‡]	E(level)[†]	J$^{\pi}$[‡]	E(level)[†]	J$^{\pi}$[‡]	E(level)[†]	J$^{\pi}$[‡]
0[#]	9/2$^+$	2331.5 4	19/2	4334.2[@] 5	(27/2$^+$)	5535.9[&] 6	33/2$^+$
772.82[#] 22	13/2$^+$	2533.9[#] 4	21/2$^+$	4376.3[&] 6	27/2$^+$	5587.3[@] 6	(33/2$^+$)
832.80 22	11/2$^+$	2733.9[&] 4	21/2$^+$	4430.2[@] 5	(29/2$^+$)	7016.7[&] 7	(37/2$^+$)
1393.50 21	13/2$^+$	3530.4[@] 5	25/2$^+$	4681.2[&] 6	29/2$^+$	7714.1[&] 8	(39/2$^+$)
1654.6[#] 3	17/2$^+$	3575.7[&] 5	23/2$^+$	5051.3[#] 5	(29/2$^+$)	8345.3[&] 8	(43/2$^+$)
1685.4 3	15/2$^{(+)}$	3643.6[#] 5	(25/2$^+$)	5322.9[&] 6	31/2$^+$		
1849.88 25	15/2$^{(+)}$	3731.2[&] 6	25/2$^+$	5461.2[@] 5	(31/2$^+$)		

[†] From least-squares fit to Eγ's, assuming Δ(Eγ)= 0.3 keV for each γ ray. A level at 2565, 19/2 shown in figure 1 of 2003Bu06 has been omitted as per e-mail reply to the XUNDL compilers from D. Bucurescu on May 23, 2003.

[‡] From 2003Bu06 (can differ from J$^{\pi}$'s In Adopted Levels, Gammas dataset).

[#] Band(A): g$_{9/2}$ band.

[@] Band(B): Band based on 25/2$^+$.

[&] Band(C): γ sequence based on 21/2$^+$.

$\gamma(^{97}\text{Tc})$

DCO ratios correspond to gate on ΔJ=2, quadrupole transition, unless otherwise stated.

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[†]	Comments
96.0	1.0 3	4430.2	(29/2$^+$)	4334.2	(27/2$^+$)	(M1+E2)	A$_2$=0.0 5; A$_4$=+0.1 6
126.1	5.2 2	5587.3	(33/2$^+$)	5461.2	(31/2$^+$)	(M1+E2)	DCO=0.34 7; A$_2$=−0.08 7; A$_4$=−0.16 9
155.5	46.2 3	3731.2	25/2$^+$	3575.7	23/2$^+$	(M1+E2)	DCO=0.45 5; A$_2$=−0.133 9; A$_4$=−0.085 12
164.3		1849.88	15/2$^{(+)}$	1685.4	15/2$^{(+)}$		
^{x}169.1[‡]	14.6 5						A$_2$=−0.18 7; A$_4$=−0.06 8 $\gamma(\theta)$ results contain contribution from a γ ray in ^{96}Tc.
195.3	3.7 3	1849.88	15/2$^{(+)}$	1654.6	17/2$^+$	(M1+E2)	A$_2$=−0.04 6; A$_4$=+0.49 8
202.4	2.5 3	2533.9	21/2$^+$	2331.5	19/2	(M1+E2)	A$_2$=+0.06 9; A$_4$=−0.02 13
213.1	5.9 3	5535.9	33/2$^+$	5322.9	31/2$^+$	(M1(+E2))	DCO=0.48 8; A$_2$=−0.237 18; A$_4$=+0.030 24
^{x}227.1[‡]	10.8 5						A$_2$=+0.10 5; A$_4$=+0.01 7
304.8	8.1 10	4681.2	29/2$^+$	4376.3	27/2$^+$	(M1+E2)	DCO=0.49 7; A$_2$=−0.09 5; A$_4$=+0.04 7
409.7	2.7 2	5461.2	(31/2$^+$)	5051.3	(29/2$^+$)	(M1+E2)	DCO=1.6 2; A$_2$=−0.46 10; A$_4$=+0.11 14 DCO corresponds to gate on ΔJ=1, dipole transition.
456.4	9.6 7	1849.88	15/2$^{(+)}$	1393.50	13/2$^+$	(M1+E2)	A$_2$=−0.37 7; A$_4$=+0.10 8 $\gamma(\theta)$ results contain contribution from a γ ray in ^{96}Tc.
560.7	4.4 6	1393.50	13/2$^+$	832.80	11/2$^+$	(M1+E2)	A$_2$=+0.50 23; A$_4$=+0.43 28
620.7	4.0 3	1393.50	13/2$^+$	772.82	13/2$^+$	(E2)	A$_2$=+0.45 5; A$_4$=−0.15 7 Mult.: ΔJ=0 transition.
631.1	9.0 5	8345.3	(43/2$^+$)	7714.1	(39/2$^+$)	(E2)	DCO=1.1 3; A$_2$=+0.337 21; A$_4$=−0.10 3
641.6	5.3 6	5322.9	31/2$^+$	4681.2	29/2$^+$	(M1(+E2))	DCO=0.35 11; A$_2$=−0.18 3; A$_4$=+0.02 4

Continued on next page (footnotes at end of table)

^{82}Se(^{19}F,4nγ)　　**2003Bu06** (continued)

$\gamma(^{97}$Tc) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
645.0	9.6 9	4376.3	27/2$^+$	3731.2	25/2$^+$	(M1+E2)	DCO=0.43 9; A$_2$=−0.086 21; A$_4$=−0.04 3
676.9	4.2 4	2331.5	19/2	1654.6	17/2$^+$	(M1+E2)	A$_2$=−0.34 4; A$_4$=−0.03 5
697.4	12.0 6	7714.1	(39/2$^+$)	7016.7	(37/2$^+$)	(M1+E2)	DCO=0.48 15; A$_2$=+0.01 3; A$_4$=+0.11 4
772.7	100 1	772.82	13/2$^+$	0	9/2$^+$	(E2)	A$_2$=+0.371 20; A$_4$=−0.125 21 uncertainty on A$_2$ is quoted as 0.002 by 2003Bu06, which seems unrealistic. The compilers have increased it to 0.020.
786.9	2.3 4	4430.2	(29/2$^+$)	3643.6	(25/2$^+$)	(E2)	A$_2$=+0.5 4; A$_4$=+0.3 5
803.8	8.7 12	4334.2	(27/2$^+$)	3530.4	25/2$^+$	(M1+E2)	DCO=0.47 9; A$_2$=−0.08 9; A$_4$=−0.04 12
832.9	4.8 3	832.80	11/2$^+$	0	9/2$^+$	(M1+E2)	A$_2$=+0.52 15; A$_4$=+0.09 19
841.8	22.2 12	3575.7	23/2$^+$	2733.9	21/2$^+$	(M1+E2)	DCO=0.53 9; A$_2$=−0.06 5; A$_4$=+0.02 6
852.7	3.8 3	1685.4	15/2$^{(+)}$	832.80	11/2$^+$		
854.7	36.1 9	5535.9	33/2$^+$	4681.2	29/2$^+$	(E2)	DCO=1.90 21; A$_2$=+0.28 3; A$_4$=−0.06 5 DCO corresponds to gate on ΔJ=1, dipole transition.
879.3	52.0 6	2533.9	21/2$^+$	1654.6	17/2$^+$	(E2)	DCO=2.7 6; A$_2$=+0.318 25; A$_4$=−0.12 3 DCO corresponds to gate on ΔJ=1, dipole transition.
881.8	85 4	1654.6	17/2$^+$	772.82	13/2$^+$	(E2)	DCO=3.4 10; A$_2$=+0.308 17; A$_4$=−0.116 22 DCO corresponds to gate on ΔJ=1, dipole transition. $\gamma(\theta)$ and DCO results contain contribution from a γ ray in ^{95}Tc.
899.7	8.1 15	4430.2	(29/2$^+$)	3530.4	25/2$^+$	(E2)	DCO=2.8 6; A$_2$=+0.37 11; A$_4$=−0.14 13 DCO corresponds to gate on ΔJ=1, dipole transition. Energy of initial level quoted as 4334.1 for this transition in Table 1 of 2003Bu06 seems a type error.
912.3	20.0 11	1685.4	15/2$^{(+)}$	772.82	13/2$^+$	(M1+E2)	A$_2$=+0.20 5; A$_4$=−0.01 6
946.7	6.2 24	5322.9	31/2$^+$	4376.3	27/2$^+$		A$_2$=−0.03 5; A$_4$=−0.20 6 $\gamma(\theta)$ results contain contribution from a γ ray in ^{96}Tc.
950.0	51.4 12	4681.2	29/2$^+$	3731.2	25/2$^+$	(E2)	DCO=0.89 13; A$_2$=+0.295 22; A$_4$=−0.07 3
996.4	15.8 16	3530.4	25/2$^+$	2533.9	21/2$^+$	(E2)	A$_2$=+0.345 17; A$_4$=−0.082 22 $\gamma(\theta)$ results contain contribution from a γ ray in ^{96}Tc.
1031.3	12.0 10	5461.2	(31/2$^+$)	4430.2	(29/2$^+$)	(M1+E2)	DCO=0.58 8; A$_2$=−0.21 3; A$_4$=+0.02 4 $\gamma(\theta)$ and DCO results contain contribution from a γ ray in ^{95}Tc.
1041.8	20.2 10	3575.7	23/2$^+$	2533.9	21/2$^+$	D(+Q)	DCO=1.43 12; A$_2$=−0.25 5; A$_4$=−0.034 27 DCO corresponds to gate on ΔJ=1, dipole transition.
1077.2	5.1 4	1849.88	15/2$^{(+)}$	772.82	13/2$^+$	(M1+E2)	A$_2$=−0.54 6; A$_4$=−0.02 7
1079.3	21.9 10	2733.9	21/2$^+$	1654.6	17/2$^+$	(E2)	DCO=2.08 22; A$_2$=+0.302 17; A$_4$=−0.078 23 DCO corresponds to gate on ΔJ=1, dipole transition.
1109.7	7.0 3	3643.6	(25/2$^+$)	2533.9	21/2$^+$	(E2)	DCO=0.80 19; A$_2$=+0.29 3; A$_4$=−0.15 3
1393.5	3.3 3	1393.50	13/2$^+$	0	9/2$^+$	(E2)	A$_2$=+0.36 4; A$_4$=−0.22 9
1407.5	3.3 4	5051.3	(29/2$^+$)	3643.6	(25/2$^+$)	(E2)	A$_2$=+0.33 11; A$_4$=−0.31 14
1480.8	18.8 7	7016.7	(37/2$^+$)	5535.9	33/2$^+$	(E2)	DCO=1.55 20; A$_2$=+0.256 19; A$_4$=−0.118 22 DCO corresponds to gate on ΔJ=1, dipole transition.

[†] ADOPTED by evaluator based on $\gamma(\theta)$ and DCO. Unless noted otherwise, the transitions are stretched.
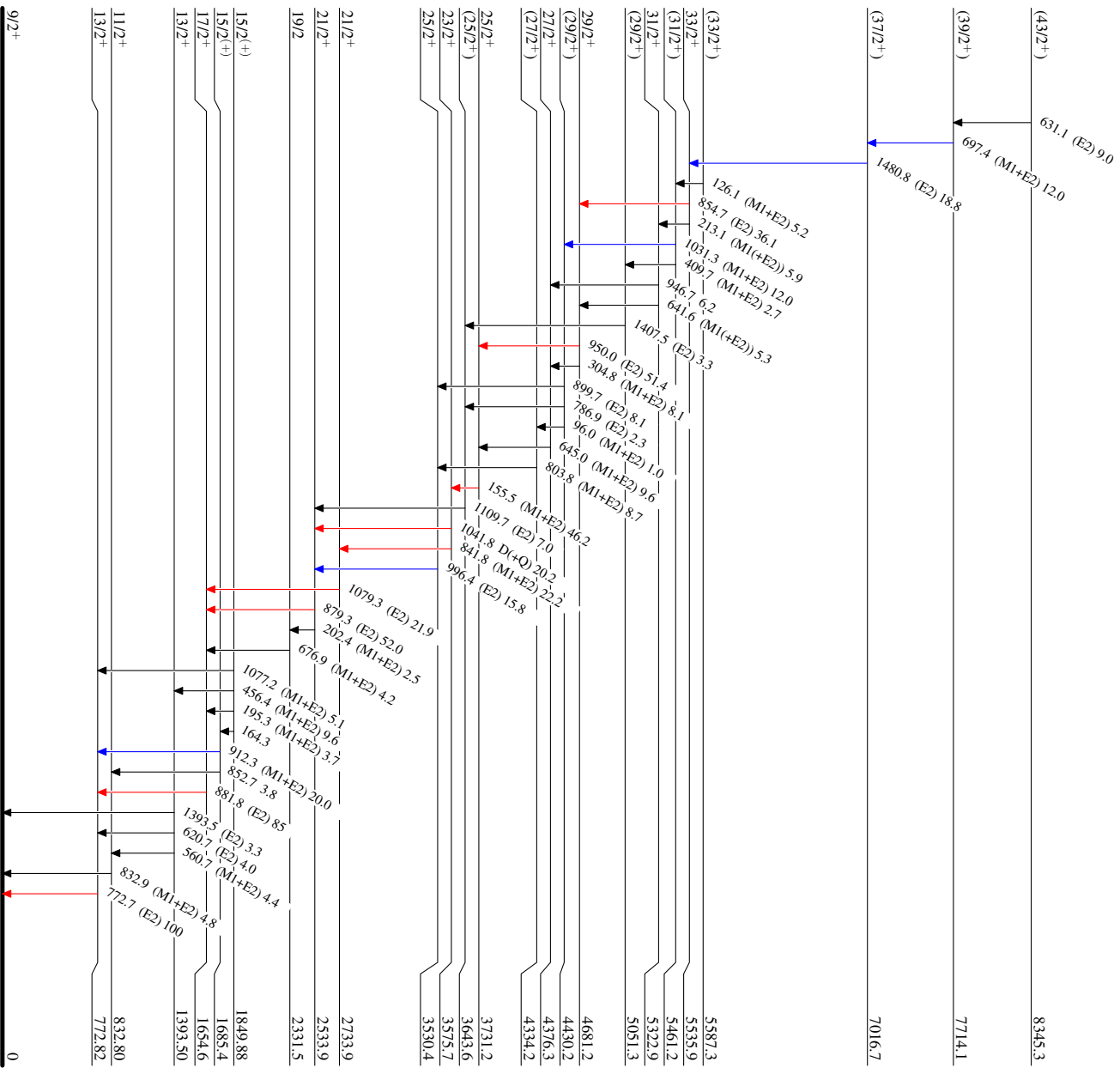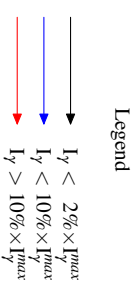
[‡] 169.1-227.1 are in mutual coin., but the placement as shown in figure 1 of 2003Bu06 is incorrect as per e-mail reply to the XUNDL compilers from D. Bucurescu on May 23, 2003. This cascade is connected with negative-parity levels.

[x] γ ray not placed in level scheme.

From ENSDF

$^{97}_{43}Tc_{54}-3$

$^{82}\textbf{Se}(^{19}\textbf{F,4n}\gamma)$ Level Scheme 2003Bu06

Intensities: Relative I_γ

Legend

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

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

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

Levels (spin/parity, energy):

(43/2⁺) 8345.3
(39/2⁺) 7714.1
(37/2⁺) 7016.7
(33/2⁺) 5587.3
(33/2⁺) 5535.9
(31/2⁺) 5461.2
(31/2⁺) 5322.9
(29/2⁺) 5051.3
29/2⁺ 4681.2
(29/2⁺) 4430.2
21/2⁺ 4376.3
(27/2⁺) 4334.2
25/2⁺ 3731.2
(25/2⁺) 3643.6
23/2⁺ 3575.7
25/2⁺ 3530.4
21/2⁺ 2733.9
21/2⁺ 2533.9
19/2 2331.5
15/2(⁺) 1849.88
15/2(⁺) 1685.4
17/2⁺ 1654.6
13/2⁺ 1393.50
11/2⁺ 832.80
13/2⁺ 772.82
9/2⁺ 0

Gamma transitions:

631.1 (E2) 9.0
697.4 (M1+E2) 12.0
1480.8 (E2) 18.8
126.1 (M1+E2) 5.2
854.7 (E2) 36.1
213.1 (M1(+E2)) 5.9
1031.3 (M1+E2) 12.0
409.7 (M1+E2) 2.7
946.7 6.2
641.6 (M1(+E2)) 5.3
1407.5 (E2) 3.3
950.0 (E2) 51.4
304.8 (M1+E2) 8.1
899.7 (E2) 8.1
786.9 (E2) 2.3
96.0 (M1+E2) 1.0
645.0 (M1+E2) 9.6
803.8 (M1+E2) 8.7
155.5 (M1+E2) 46.2
1109.7 (E2) 7.0
1041.8 D(+Q) 20.2
841.8 (M1+E2) 22.2
996.4 (E2) 15.8
1079.3 (E2) 21.9
879.3 (E2) 52.0
202.4 (M1+E2) 2.5
676.9 (M1+E2) 4.2
1077.2 (M1+E2) 5.1
456.4 (M1+E2) 9.6
195.3 (M1+E2) 3.7
164.3
912.3 (M1+E2) 20.0
852.7 3.8
881.8 (E2) 85
1393.5 (E2) 3.3
620.7 (E2) 4.0
560.7 (M1+E2) 4.4
832.9 (M1+E2) 4.8
772.7 (E2) 100

^{82}Se(^{19}F,4nγ)　　　2003Bu06

Band(C): γ sequence based on 21/2$^+$

(43/2$^+$)　　　8345.3

631

(39/2$^+$)　　　7714.1

697

(37/2$^+$)　　　7016.7

1481

Band(B): Band based on 25/2$^+$

(33/2$^+$)　　5587.3
(31/2$^+$)　126　5461.2

Band(A): g$_{9/2}$ band

(29/2$^+$)　　5051.3

33/2$^+$　　　5535.9
31/2$^+$　213　5322.9

855
642
947

1031

29/2$^+$　　　4681.2

(29/2$^+$)　　4430.2
(27/2$^+$)　96　4334.2

27/2$^+$　305　4376.3

1408

950
645

804　900

(25/2$^+$)　　3643.6

25/2$^+$　　　3530.4

25/2$^+$　　　3731.2
23/2$^+$　156　3575.7

1110

842

21/2$^+$　　2533.9

21/2$^+$　　　2733.9

879

17/2$^+$　　1654.6

882

13/2$^+$　　772.82

773

9/2$^+$　　0

$^{97}_{43}$Tc$_{54}$