

$^{112}\text{Cd}(^{12}\text{C},3n\gamma)$ 1982Ba31

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. Ohya	NDS 111, 1619 (2010)	20-Jan-2009

E=52-75 MeV, excitation function, $\gamma(\theta)$, $\gamma\gamma$, $\gamma\gamma(t)$.

The band structure proposed by 1982Ba31 needs to be modified to conform to the extensive band structures established in $^{96}\text{Zr}(^{30}\text{Si},5n\gamma)$ by 1995Ti04, as mentioned in the respective band designations;

 ^{121}Xe Levels

E(level)	J^π @	$T_{1/2}$ &	E(level)	J^π @
0.0 [†]	5/2 ⁽⁺⁾		1274.10 [#] 18	(19/2 ⁻)
153.70 9	(1/2 ⁺)		1281.20 [†] 13	(15/2 ⁺)
179.30 [†] 8	7/2 ⁽⁺⁾		1310.4 4	(15/2 ⁻)
196.10 [#] 10	7/2 ⁽⁻⁾	5.5 ns 5	1590.2 [‡] 5	(15/2 ⁺)
234.50 [#] 12	7/2 ⁽⁻⁾ , 9/2 ⁽⁻⁾		1618.10 [†] 17	(17/2 ⁺)
239.80 [‡] 9	(3/2 ⁺)		1985.50 [†] 19	(19/2 ⁺)
264.80 [#] 13	(11/2 ⁻)	6 ns 1	1996.00 [#] 20	(23/2 ⁻)
414.00 [†] 8	(9/2 ⁺)		2015.51 [#] 18	(21/2 ⁻)
560.8 [‡] 4	(7/2 ⁺)		2245.3 [‡] 6	(19/2 ⁺)
658.00 [#] 15	(13/2 ⁻)		2355.81 [†] 22	(21/2 ⁺)
670.20 [†] 10	(11/2 ⁺)		2748.7 [†] 5	(23/2 ⁺)
687.10 [#] 16	(15/2 ⁻)		2833.81 [#] 23	(27/2 ⁻)
776.0 ^a 10			2882.0 [#] 3	(25/2 ⁻)
815.3 ^a 10			3102.2 [†] 3	(25/2 ⁺)
942.4 ^a 5			3272.1 3	(27/2 ⁺)
963.00 [†] 11	(13/2 ⁺)		3764.6 [#] 3	(31/2 ⁻)
1021.5 [‡] 5	(11/2 ⁺)		4754.1 [#] 8	(35/2 ⁻)
1265.00 [#] 16	(17/2 ⁻)			

[†] Band(A): Band based on 2d_{5/2}. The 23/2⁺ member has been removed from the assignment of 1982Ba31.

[‡] Band(B): decoupled band based on 2d_{3/2}.

[#] Band(C): Negative-parity band based on 1h_{11/2}. The order of 169.9 γ and 1106.2 γ has been reversed resulting in a 3102-keV level.

@ From Adopted Levels.

& From $\gamma(t)$.

^a Not observed in $^{96}\text{Zr}(^{30}\text{Si},5n\gamma)$.

 $\gamma(^{121}\text{Xe})$

RI(I,H,J) Intensity derived from coincidence data.

E_γ	I_γ @	$E_i(\text{level})$	J^π_i	E_f	J^π_f	Mult. [†]	Comments
30.3		264.80	(11/2 ⁻)	234.50	7/2 ⁽⁻⁾ , 9/2 ⁽⁻⁾		
38.4 1	61 6	234.50	7/2 ⁽⁻⁾ , 9/2 ⁽⁻⁾	196.10	7/2 ⁽⁻⁾	D(+Q)	Mult.: A ₂ =-0.37 4, A ₄ =+0.08 13.
55.2 2	7 1	234.50	7/2 ⁽⁻⁾ , 9/2 ⁽⁻⁾	179.30	7/2 ⁽⁺⁾	D	Mult.: A ₂ =-0.54 25, A ₄ =-0.4 3.
68.7 1	11 1	264.80	(11/2 ⁻)	196.10	7/2 ⁽⁻⁾	Q	Mult.: A ₂ =+0.14 13, A ₄ =-0.08 19.
86.1 1	8 1	239.80	(3/2 ⁺)	153.70	(1/2 ⁺)	D(+Q)	Mult.: A ₂ =-0.47 12, A ₄ =-0.3 2.

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$^{112}\text{Cd}(^{12}\text{C},3n\gamma)$ **1982Ba31 (continued)** $\gamma(^{121}\text{Xe})$ (continued)

E_γ	I_γ @	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
153.7 1	15 2	153.70	(1/2 ⁺)	0.0	5/2 ⁽⁺⁾	Q	Mult.: $A_2=-0.1$ 4, $A_4=-0.2$ 6.
169.9 1	36 3	3272.1	(27/2 ⁺)	3102.2	(25/2 ⁺)	D	Mult.: $A_2=-0.43$ 13, $A_4=-0.04$ 17.
179.3 1	240 10	179.30	7/2 ⁽⁺⁾	0.0	5/2 ⁽⁺⁾	D(+Q)	Mult.: $A_2=-0.68$ 6, $A_4=-0.04$ 7.
196.1 1	1000 50	196.10	7/2 ⁽⁻⁾	0.0	5/2 ⁽⁺⁾	D	Mult.: $A_2=-0.33$ 4, $A_4=+0.03$ 5.
234.7 1	93 8	414.00	(9/2 ⁺)	179.30	7/2 ⁽⁺⁾	D(+Q)	Mult.: $A_2=-0.52$ 11, $A_4=-0.04$ 10.
239.8 1	25 3	239.80	(3/2 ⁺)	0.0	5/2 ⁽⁺⁾	D(+Q)	Mult.: $A_2=-0.01$ 11, $A_4=-0.04$ 16.
256.2 1	48 5	670.20	(11/2 ⁺)	414.00	(9/2 ⁺)	D(+Q)	Mult.: $A_2=-0.53$ 20, $A_2=-0.04$ 10.
292.8 1	22 3	963.00	(13/2 ⁺)	670.20	(11/2 ⁺)	D(+Q)	Mult.: $A_2=-0.81$ 9, $A_4=+0.18$ 21.
318.2 [‡] 2	19 4	1281.20	(15/2 ⁺)	963.00	(13/2 ⁺)		
321.0 4	50 9	560.8	(7/2 ⁺)	239.80	(3/2 ⁺)	Q	Mult.: $A_2=+0.35$ 12, $A_4=-0.3$ 2.
336.9 2	12 4	1618.10	(17/2 ⁺)	1281.20	(15/2 ⁺)	D(+Q)	Mult.: $A_2=-0.6$ 5, $A_4=-0.3$ 6.
362 1	4 2	776.0		414.00	(9/2 ⁺)		
367.4 2	20 4	1985.50	(19/2 ⁺)	1618.10	(17/2 ⁺)	D(+Q)	Mult.: $A_2=-0.7$ 3, $A_4=-0.1$ 4.
370.3 [‡] 2	6 2	2355.81	(21/2 ⁺)	1985.50	(19/2 ⁺)		
381.5 10	3 1	560.8	(7/2 ⁺)	179.30	7/2 ⁽⁺⁾		
393.2 1	130 10	658.00	(13/2 ⁻)	264.80	(11/2 ⁻)	D(+Q)	Mult.: $A_2=-0.87$ 15, $A_4=-0.05$ 15.
414.0 1	42 6	414.00	(9/2 ⁺)	0.0	5/2 ⁽⁺⁾	Q	Mult.: $A_2=+0.35$ 14, $A_4=+0.2$ 2.
422.3 1	660 50	687.10	(15/2 ⁻)	264.80	(11/2 ⁻)	Q	Mult.: $A_2=+0.24$ 6, $A_4=-0.09$ 10 (for 422.3 γ +423.5 γ).
423.5 2	93 10	658.00	(13/2 ⁻)	234.50	7/2 ⁽⁻⁾ , 9/2 ⁽⁻⁾	(Q)	
460.7 2	48 10	1021.5	(11/2 ⁺)	560.8	(7/2 ⁺)	(Q)	Mult.: $A_2=+0.14$ 25, $A_4=+0.1$ 4.
490.9 1	66 9	670.20	(11/2 ⁺)	179.30	7/2 ⁽⁺⁾	Q	Mult.: $A_2=+0.20$ 15, $A_4=+0.11$ 23.
549.0 1	62 10	963.00	(13/2 ⁺)	414.00	(9/2 ⁺)	Q	Mult.: $A_2=+0.20$ 17, $A_4=+0.04$ 25.
568.7 2	44 11	1590.2	(15/2 ⁺)	1021.5	(11/2 ⁺)	(Q)	Mult.: $A_2=+0.16$ 27, $A_4=-0.05$ 40.
577.9 1	60 7	1265.00	(17/2 ⁻)	687.10	(15/2 ⁻)	D(+Q)	Mult.: $A_2=-0.96$ 21, $A_4=+0.28$ 32.
587.0 1	440 30	1274.10	(19/2 ⁻)	687.10	(15/2 ⁻)	Q	Mult.: $A_2=+0.25$ 4, $A_4=-0.03$ 6.
607.0 1	125 10	1265.00	(17/2 ⁻)	658.00	(13/2 ⁻)	Q	Mult.: $A_2=+0.16$ 4, $A_4=0.00$ 6.
611.0 1	71 9	1281.20	(15/2 ⁺)	670.20	(11/2 ⁺)	Q	Mult.: $A_2=+0.19$ 12, $A_4=+0.09$ 19.
636 [#] 1	7 3	815.3		179.30	7/2 ⁽⁺⁾		
652.4 3	42 8	1310.4	(15/2 ⁻)	658.00	(13/2 ⁻)		
655.1 ^{&} 2	40 ^{&} 10	1618.10	(17/2 ⁺)	963.00	(13/2 ⁺)	(Q)	Mult.: $A_2=+0.32$ 11, $A_4=-0.07$ 32 for undivided multiply placed γ .
655.1 ^{&} 2	40 ^{&} 10	2245.3	(19/2 ⁺)	1590.2	(15/2 ⁺)	Q	Mult.: $A_2=+0.32$ 11, $A_4=-0.07$ 32 for undivided multiply placed γ .
677.6 ^a 4	25 5	942.4?		264.80	(11/2 ⁻)	D(+Q)	Mult.: $A_2<0$.
704.3 [‡] 2	<80	1985.50	(19/2 ⁺)	1281.20	(15/2 ⁺)	(Q)	Mult.: $A_2=+0.21$ 11, $A_4=+0.09$ 17.
721.9 1	280 30	1996.00	(23/2 ⁻)	1274.10	(19/2 ⁻)	Q	Mult.: $A_2=+0.37$ 8, $A_4=-0.01$ 14.
737.7 2	48 6	2355.81	(21/2 ⁺)	1618.10	(17/2 ⁺)	Q	Mult.: $A_2=+0.19$ 8, $A_4=+0.08$ 12 for 737.7 γ + 738 γ (unplaced γ).
^x 738 ^a 1	48 6						Originally placed as transition from (23/2 ⁺) to (19/2 ⁺) of 2d _{3/2} band in 1982Ba31.
741.4 2	20 5	2015.51	(21/2 ⁻)	1274.10	(19/2 ⁻)	D(+Q)	Mult.: $A_2<0$.
750.5 [‡] 1	68 10	2015.51	(21/2 ⁻)	1265.00	(17/2 ⁻)	(Q)	Mult.: $A_2=+0.28$ 12, $A_4=+0.13$ 19 for a composite line.
763.2 [‡] 4	<60	2748.7	(23/2 ⁺)	1985.50	(19/2 ⁺)	(Q)	Mult.: $A_2>0$ for a composite line.
837.8 1	130 20	2833.81	(27/2 ⁻)	1996.00	(23/2 ⁻)	Q	Mult.: $A_2=+0.38$ 13, $A_4=+0.04$ 22.
866.5 3	49 16	2882.0	(25/2 ⁻)	2015.51	(21/2 ⁻)	(Q)	Mult.: $A_2=+0.26$ 31, $A_4=-0.2$ 4.
886.0 3	22 5	2882.0	(25/2 ⁻)	1996.00	(23/2 ⁻)		
930.8 2	90 20	3764.6	(31/2 ⁻)	2833.81	(27/2 ⁻)	Q	Mult.: $A_2=+0.24$ 19, $A_4=-0.16$ 29.
989.5 7	10 4	4754.1	(35/2 ⁻)	3764.6	(31/2 ⁻)		
1106.2 2	36 6	3102.2	(25/2 ⁺)	1996.00	(23/2 ⁻)	D	Mult.: $A_2=-0.4$ 3, $A_4=+0.1$ 4.

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$^{112}\text{Cd}(^{12}\text{C},3\text{n}\gamma)$ **1982Ba31 (continued)**

$\gamma(^{121}\text{Xe})$ (continued)

[†] From $\gamma(\theta)$.

[‡] Composite peak.

Energy derived from coincidence data.

@ Relative to I(196.1 γ)=1000 at $\theta=55^\circ$, E=60 MeV.

& Multiply placed with undivided intensity.

^a Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

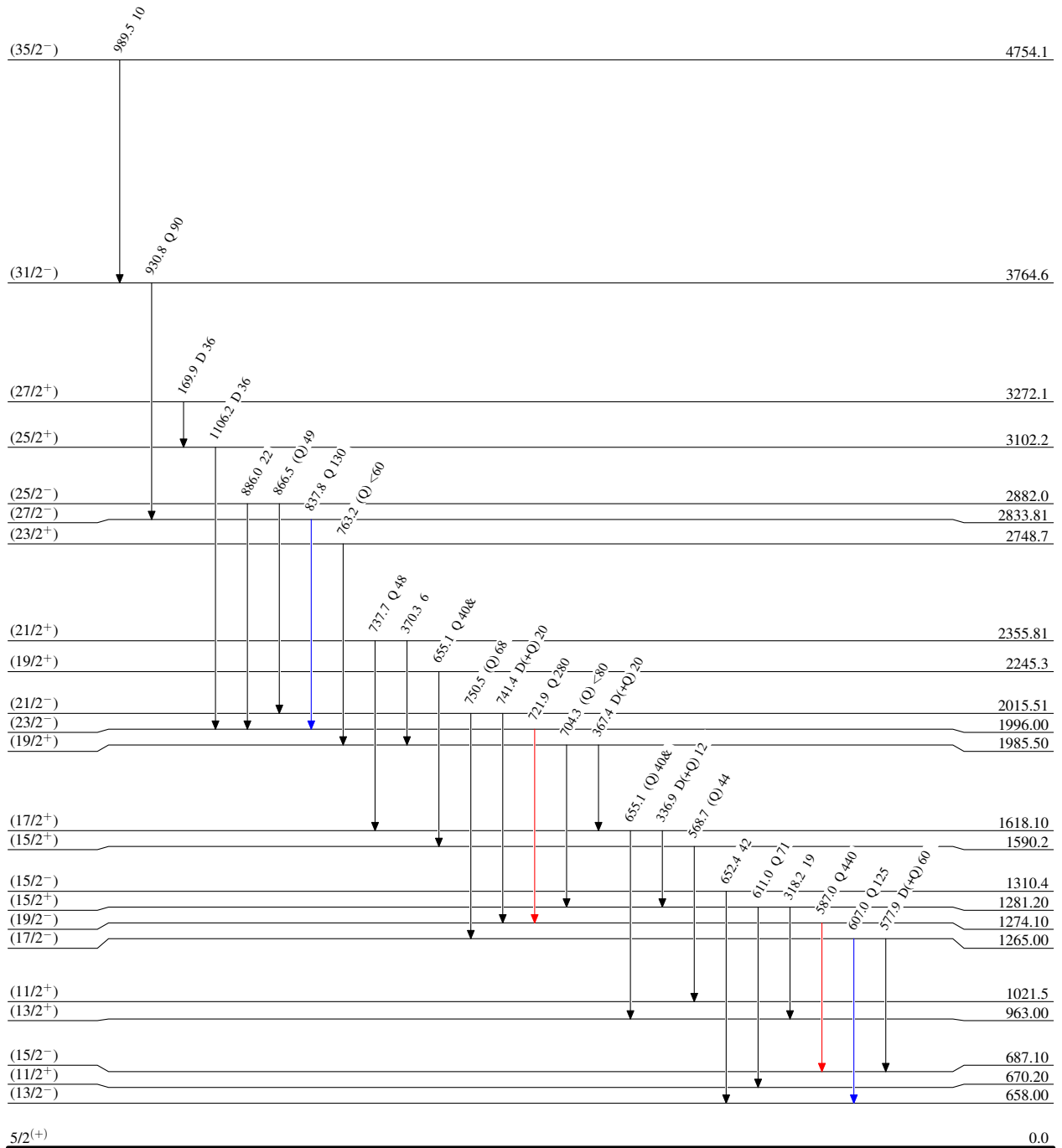
$^{112}\text{Cd}(^{12}\text{C},3n\gamma) \quad 1982\text{Ba31}$

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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



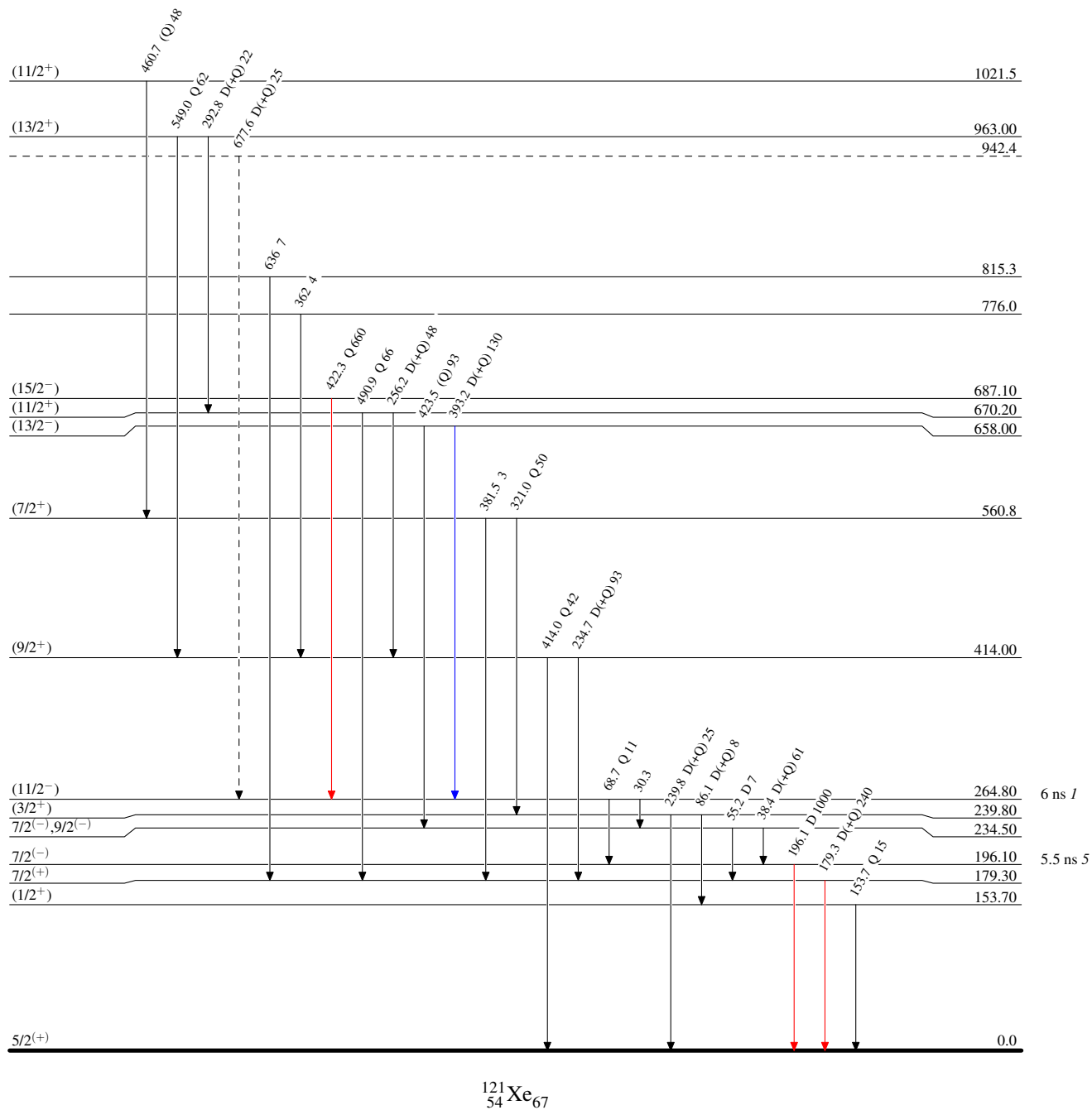
$^{112}\text{Cd}(^{12}\text{C},3\text{n}\gamma) \quad 1982\text{Ba31}$

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\max}$
 $-\cdots-\cdots$ γ Decay (Uncertain)



Band(C): Negative-parity band based on $1h_{11/2}$

