

^{229}Ra β^- decay 1997Ya05,1975We23

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 109, 2657 (2008)	1-Jun-2008

Parent: ^{229}Ra : $E=0.0$; $J^\pi=5/2^{(+)}$; $T_{1/2}=4.0$ min 2; $Q(\beta^-)=1810$ 30; $\% \beta^-$ decay=100.0

1997Yu02.

1997Ya05, 1997Yu02: Measured γ rays in singles and $\gamma\gamma$ coin, $\gamma\gamma(t)$, and $X\gamma(t)$. Detectors: hyperpure germanium.

1975We23: Measured β^- particles, end-point energies, $\beta\gamma$ coin.

Additional information 1.

 ^{229}Ac Levels

<u>E(level)[†]</u>	<u>J^π#</u>	<u>T_{1/2}</u>	<u>E(level)[†]</u>	<u>J^π#</u>	<u>E(level)[†]</u>	<u>J^π#</u>
0.0 [@]	(3/2 ⁺)	62.7 min 5	104.3 ^{&} 4	(3/2 ⁻)	189.0 ^a 7	(3/2 ⁺)
7.0 [@] 5	(5/2 ⁺)		119.8 ^c 5	(7/2 ⁻)	222.0 7	
21.4 [@] 5	(7/2 ⁺)		141.5 5		280.9 6	
25.9 [@] 5	(9/2 ⁺)		164.0 ^{&} 5	(7/2 ⁻)	335.5 ^b 7	(3/2 ⁺)
69.8 ^c 4	(5/2 ⁻)		174.8 6		720 [‡] 60	

[†] Deduced by evaluators from least-squares fit to γ -ray energies.

[‡] From β energy and the $Q(\beta^-)$ value of 1810 30.

From Adopted Levels.

@ Band(A): 3/2[651] band.

& Band(B): 1/2[530] band.

^a Band(C): 1/2[400] band.

^b Band(D): 3/2[402] band.

^c Band(E): 5/2[532] band.

 β^- radiations

<u>E(decay)</u>	<u>E(level)</u>	<u>Iβ^-[†]</u>	<u>Log ft</u>	<u>Comments</u>
1090 50	720	≤ 5	≥ 6.1	av $E\beta=357$ 31 E(decay): F-K analysis of the β' 's in coincidence with all γ rays above 200 keV gave an endpoint energy of 1.09 5 MeV (1975We23).
1760 40	0.0	≥ 95	≤ 5.6	av $E\beta=620$ 17 E(decay): from F-K analysis of β spectrum gave an endpoint of 1.76 4 MeV (1975We23). I β^- : from β - γ coincidence data, less than 5% of the β particles were found to be in coincidence with E>200 keV γ rays (1975We23).

[†] Absolute intensity per 100 decays.

 $\gamma(^{229}\text{Ac})$

<u>E_{γ}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>
(7.0)	7.0	(5/2 ⁺)	0.0	(3/2 ⁺)
14.5 [†] 3	21.4	(7/2 ⁺)	7.0	(5/2 ⁺)
15.6 [†] 3	119.8	(7/2 ⁻)	104.3	(3/2 ⁻)
18.8 3	25.9	(9/2 ⁺)	7.0	(5/2 ⁺)
21.8 3	141.5		119.8	(7/2 ⁻)

Continued on next page (footnotes at end of table)

^{229}Ra β^- decay 1997Ya05,1975We23 (continued) $\gamma(^{229}\text{Ac})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
22.5 3	164.0	(7/2 ⁻)	141.5		94.1 5	164.0	(7/2 ⁻)	69.8	(5/2 ⁻)
44.0 [†] 5	164.0	(7/2 ⁻)	119.8	(7/2 ⁻)	98.5 5	119.8	(7/2 ⁻)	21.4	(7/2 ⁺)
47.5 5	189.0	(3/2 ⁺)	141.5		102.2 5	222.0		119.8	(7/2 ⁻)
55.0 5	174.8		119.8	(7/2 ⁻)	104.5 5	104.3	(3/2 ⁻)	0.0	(3/2 ⁺)
63.0 5	69.8	(5/2 ⁻)	7.0	(5/2 ⁺)	106.1 5	280.9		174.8	
69.6 5	69.8	(5/2 ⁻)	0.0	(3/2 ⁺)	161.1 5	280.9		119.8	(7/2 ⁻)
93.6 5	119.8	(7/2 ⁻)	25.9	(9/2 ⁺)	171.5 5	335.5	(3/2 ⁺)	164.0	(7/2 ⁻)

[†] Measured in coincidence with Ac $K\alpha_1$ x ray (1997Ya05,1977Yu02).

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Decay Scheme

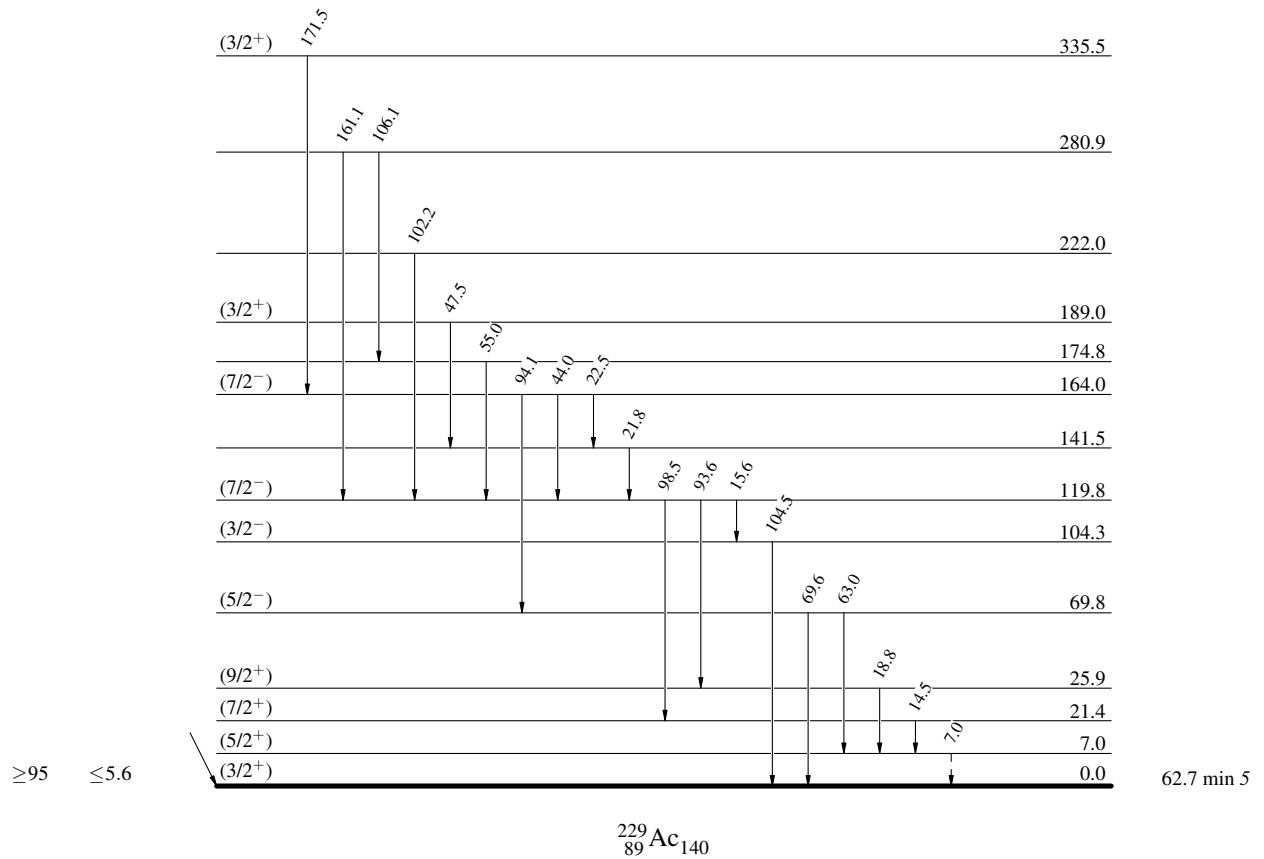
Legend

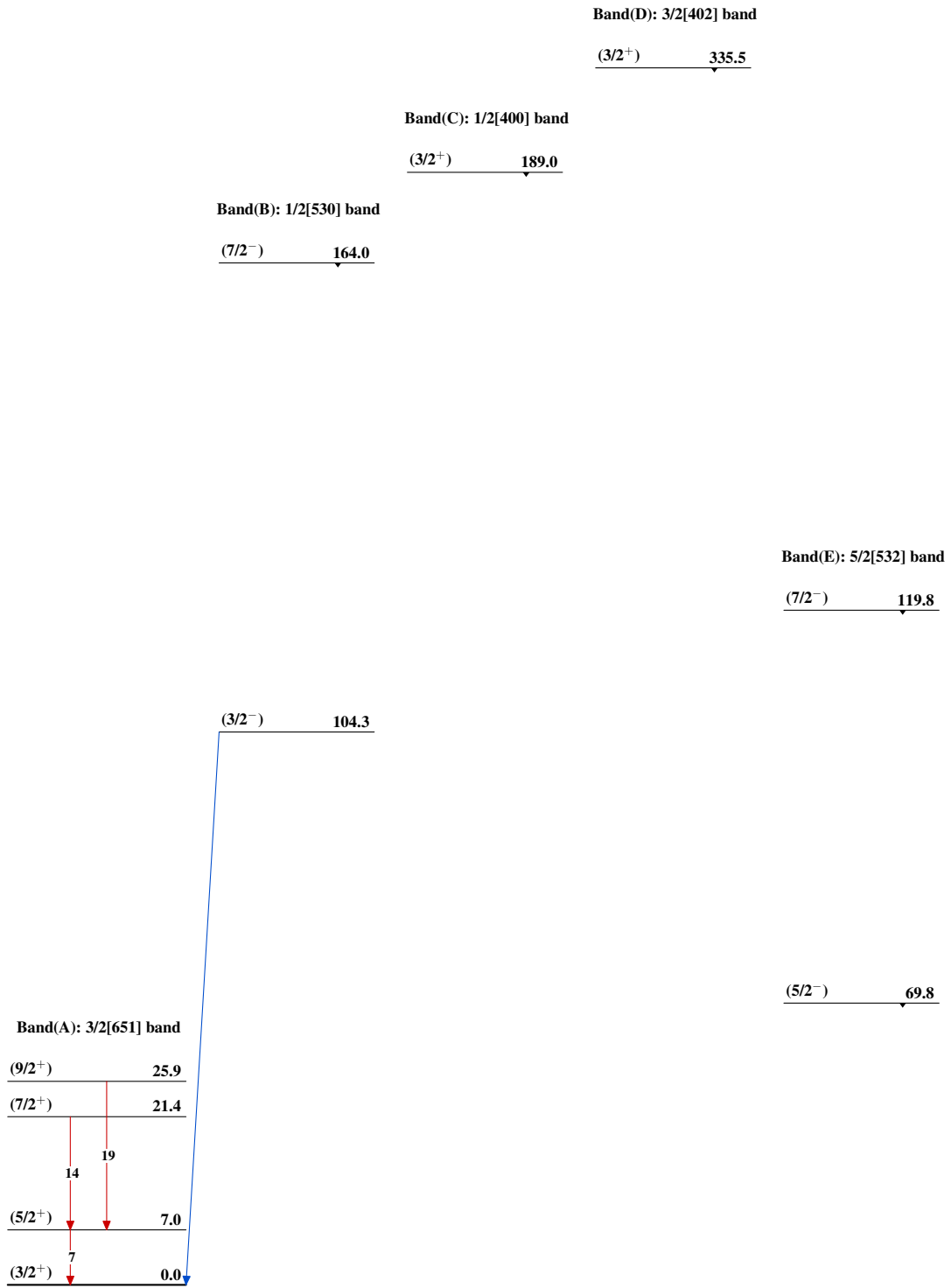
$5/2^{(+)}$ 0.0 4.0 min 2
 $Q_{\beta^-}=1810.30$ $\% \beta^- = 100$
 $^{229}_{88}\text{Ra}_{141}$

----- \blacktriangleright γ Decay (Uncertain)

$I\beta^-$ $\text{Log } ft$
 ≤ 5 ≥ 6.1

720



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