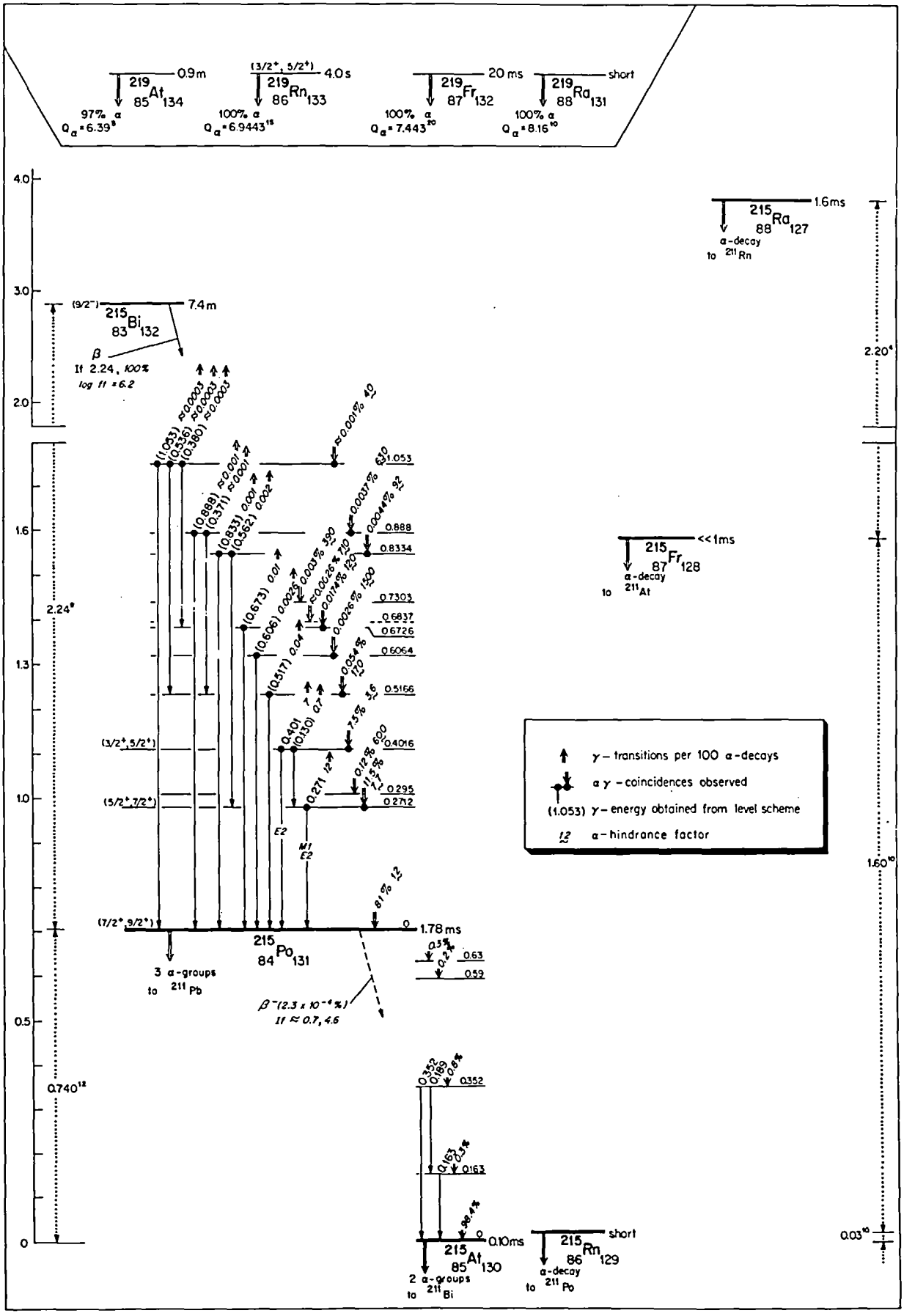
219 85At134 0.9m
97% α
Qα = 6.39
(3/2+, 5/2+) 219 86Rn133 4.0s
100% α
Qα = 6.9443
219 87Fr132 20 ms
100% α
Qα = 7.443
219 88Ra131 short
100% α
Qα = 8.16
215 88Ra127 1.6ms
α-decay to 211Rn
215 83Bi132 7.4m
(9/2−)
β
If 2.24, 100%
log ft = 6.2
215 87Fr128 <<1ms
α-decay to 211At
3 α-groups to 211Pb
215 84Po131 1.78ms
(7/2+, 9/2+)
β−(2.3 x 10−4 %)
If ≈ 0.7, 4.6
215 85At130 0.10ms
2 α-groups to 211Bi
215 86Rn129 short
α-decay to 211Po
γ - transitions per 100 α-decays
α γ - coincidences observed
(1.053) γ - energy obtained from level scheme
12 α - hindrance factor

Spin Assignments

$^{215}_{83}Bi_{132}$ ground state
$J^{\pi} = (9/2^-)$ Shell model

$^{215}_{84}Po_{131}$ ground state
$J^{\pi} = (7/2^+, 9/2^+)$ } From conversion-coefficient data and $\alpha\gamma(\theta)$ results
0.2712 level
$J^{\pi} = (5/2^+, 7/2^+)$ } Parities from shell model
0.4016 level
$J^{\pi} = (3/2^+, 5/2^+)$ }

$^{215}_{85}At_{130}$ Log $ft \approx 4.6$ for β-decay from ^{215}Po suggests a low-lying positive parity state in ^{215}At, which is unexpected from shell model considerations

Comments

B. Level Scheme of ^{215}Po

The level scheme presented is based on the ^{219}Rn α-energies of 62Wa18 and the $\alpha\gamma$-coincidences of 65Va10.

Ground-State Decay $Q^- = 2.24\ 9$

$T_{1/2}$	8 m 2	53H83
	$^{A}7.4$ 6	65Nu03

β^- to ^{215}Po — ^{215}Po α's observed 53H83

Assignment

d ^{219}At	53H83, 65Nu03
p ^{215}Po (α observed)	53H83
Not ^{219}Rn or d ^{219}Rn	65Nu03

The assignment seems established by the above observations. However, neither 53H83 nor 65Nu03 were able to extract the activity directly from ^{227}Ac with Bi carriers.

(AcA) $^{215}_{84}Po_{131}$

Ground-State Decay — $Q^- = 0.740\ 12$; $Q_\alpha = 7.5239\ 16$

$T_{1/2}$

1.83 ms		42W04
1.778 5		61Vo6
[A] 1.78 ms		

α to ^{211}Pb[a] ≈100%

α_0

7.3841 10		s	61Ry2
100% (7.3841)		s	62Wa18
[A] 7.3841 16			

α_{438}

0.034%	6.9544	s	62Wa18

α_{444}

0.022%	6.9478	s	62Wa18

β^- to ^{215}At [A] 2.3×10^{-4}%

5×10^{-4} %	44K01; 44K02
2.3×10^{-4} %	50A61
$\approx4\times10^{-4}$ %	55A09

from observation of ≈8-MeV α attributed to ^{215}At daughter

γ

≈0.443	α_K < 0.05	α scin γ	65Va10

$\alpha\gamma$

$(0.443\gamma)(\alpha_{438}+\alpha_{444})$	65Va10

Assignment

Well known. See, for example, 64Hy02, p. 423

[a] α-subscript gives adopted energy, to nearest keV, of daughter level

[A] Adopted value

$^{215}_{85}At_{130}$

Ground-State Decay — β-Stable; $Q_\alpha = 8.16\ 1$

$T_{1/2}$

0.10 ms 2		51M10

α to ^{211}Bi[a] 100%

α_0

8.04		a	50A61
8.00 2		ic	51M10
100% [A] 8.00‡1		semi	66Gr07

α_{404}

0.05%	7.60 1	(semi α)(scin γ)	66Gr07

A level at 0.404 in ^{211}Bi is known from ^{211}Pb β^--decay

‡In the mass adjustment a small calibration correction has been added by compilers

$\gamma(^{211}Bi)$

=0.40	$\alpha\gamma$	66Gr07

$\alpha\gamma$

$(E_\alpha > 6.6)(0.404\gamma)$	66Gr07
$(E_\gamma > 0.04)(\alpha_{404})$	66Gr07

Assignment

d ^{219}Rn	44K02
d ^{227}Th	50A61
^{215}At assignment from α-β cycle	44K02, 50A61
d ^{227}Pa	51M10

$^{215}_{86}Rn_{129}$

Ground-State Decay			$Q^+ = 0.03$ *10* $Q_\alpha = 8.78$ *10*
$T_{1/2}$	short (≈ 1 μs estimated from systematics)		52M13
α to ^{211}Po			
	8.6‡*1*	ic	52M13
Assignment			
	d ^{227}U		52M13
	^{215}Rn assignment from α-systematics		

‡In the mass adjustment a small calibration correction has been added by compilers

$^{215}_{87}Fr_{128}$

Ground-State Decay			$Q^+ = 1.6$ *1* $Q_\alpha = 9.586$ *30*
$T_{1/2}$	<<1 ms		61Gr43
α to ^{211}At			
	≈9.4‡	semi	61Gr43

‡In the mass adjustment a small calibration correction has been added by compilers

Assignment

^{208}Pb(^{11}B,xn) excit 61Gr43

$^{215}_{88}Ra_{127}$

Ground-State Decay			$Q^+ = 2.20$ *4* $Q_\alpha = 8.895$ *20*
$T_{1/2}$	1.6 ms		61Gr43, 62Gr20
α to ^{211}Rn			
	8.73	semi	61Gr43, 62Gr20
	8.73	semi	65Ro18
Assignment			62Gr20
	^{209}Bi(^{11}B,xn) excit		

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