$^{44}_{21}\mathrm{Sc}_{23}$

1 Decay Scheme

Sc-44 disintegrates by beta plus emission mainly (94.27(5) %) and by electron capture (5.73(5)%) to excited levels in Ca-44. No transition to the ground state has been observed.
Le scandium 44 se désintègre principalement par émission bêta plus (94,27(5) %) et par capture électronique (5,73(5) %) vers des niveaux excités du calcium 44. Aucune transition vers le niveau fondamental n'a été observée.

2 Nuclear Data

$T_{1/2}(^{44}\mathrm{Sc})$: 3,97 (4) h
$Q^{+}(^{44}\mathrm{Sc})$: 3653,3 (19) keV

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg ft	P_K	P_L	P_{M+}
$\epsilon_{0,3}$	351,8 (19)	0,00440 (11)	Allowed	6,6	0,8954 (20)	0,0911 (16)	0,0135 (7)
$\epsilon_{0,2}$	996,8 (19)	1,02 (2)	Super Allowed Or Allowed	5,2	0,8966 (19)	0,0900 (16)	0,0134 (7)
$\epsilon_{0,1}$	2496,3 (19)	4,70 (5)	Allowed	5,3	0,8970 (19)	0,0897 (16)	0,0133 (7)

2.2 β^+ Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta^+_{0,1}$	1474,3 (19)	94,27 (5)	Allowed	

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_K (10^{-5})	α_L (10^{-5})	α_M (10^{-5})	α_T (10^{-5})	α_π (10^{-5})
$\gamma_{1,0}$(Ca)	1157,023 (15)	99,882 (3)	E2	5,90 (18)	0,499 (15)	0,081 (2)	6,48 (19)	
$\gamma_{2,1}$(Ca)	1499,463 (20)	0,908 (15)	M1+1,8%E2	2,9 (1)	0,243 (7)	0,047 (2)	3,19 (10)	
$\gamma_{3,1}$(Ca)	2144,42 (8)	0,0036 (7)	[M1+E2+E0]					35 (4)
$\gamma_{2,0}$(Ca)	2656,444 (24)	0,112 (3)	[E2]					60 (6)
$\gamma_{3,0}$(Ca)	3301,33 (6)	0,0017 (2)	[E2]					78 (8)

3 Atomic Data

3.1 Ca

ω_K : 0,169 (4)
$\bar{\omega}_L$: 0,0022 (5)
n_{KL} : 1,621 (6)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	3,68813		50,61
	$K\alpha_1$	3,69172		100
	$K\beta_1$	4,0128	}	
	$K\beta_5''$	4,0325	}	19,52
X_L				
	$L\ell$	0,350		
	$L\gamma$	– 0,412		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	3,123 – 3,307	100
KLX	3,543 – 3,666	25,9
KXY	3,951 – 3,987	1,68
Auger L	0,044 – 0,387	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Ca)	0,044 - 0,387	8,71 (5)
e_{AK}	(Ca)		4,21 (3)
	KLL	3,123 - 3,307	}
	KLX	3,543 - 3,666	}
	KXY	3,951 - 3,987	}
$\beta^+_{0,1}$	max:	1474,3 (19)	94,27 (5)
$\beta^+_{0,1}$	avg:	632,0 (9)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Ca)	0,350 — 0,412	0,019 (4)	
XKα_2	(Ca)	3,68813	0,255 (7)	} Kα
XKα_1	(Ca)	3,69172	0,504 (13)	}
XKβ_1	(Ca)	4,0128 }	0,098 (3)	K$'\beta_1$
XKβ''_5	(Ca)	4,0325 }		

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma^{\pm}$	511	188 (3)
$\gamma_{1,0}$(Ca)	1157,020 (15)	99,875 (3)
$\gamma_{2,1}$(Ca)	1499,46 (2)	0,908 (15)
$\gamma_{3,1}$(Ca)	2144,33 (10)	0,0036 (7)
$\gamma_{2,0}$(Ca)	2656,48 (7)	0,112 (3)
$\gamma_{3,0}$(Ca)	3301,35 (6)	0,0017 (2)

6 Main Production Modes

K – 41(α,n)Sc – 44
Sc – 45(γ,n)Sc – 44
Daughter of Ti – 44
Daughter of Sc – 44 (2,4d)

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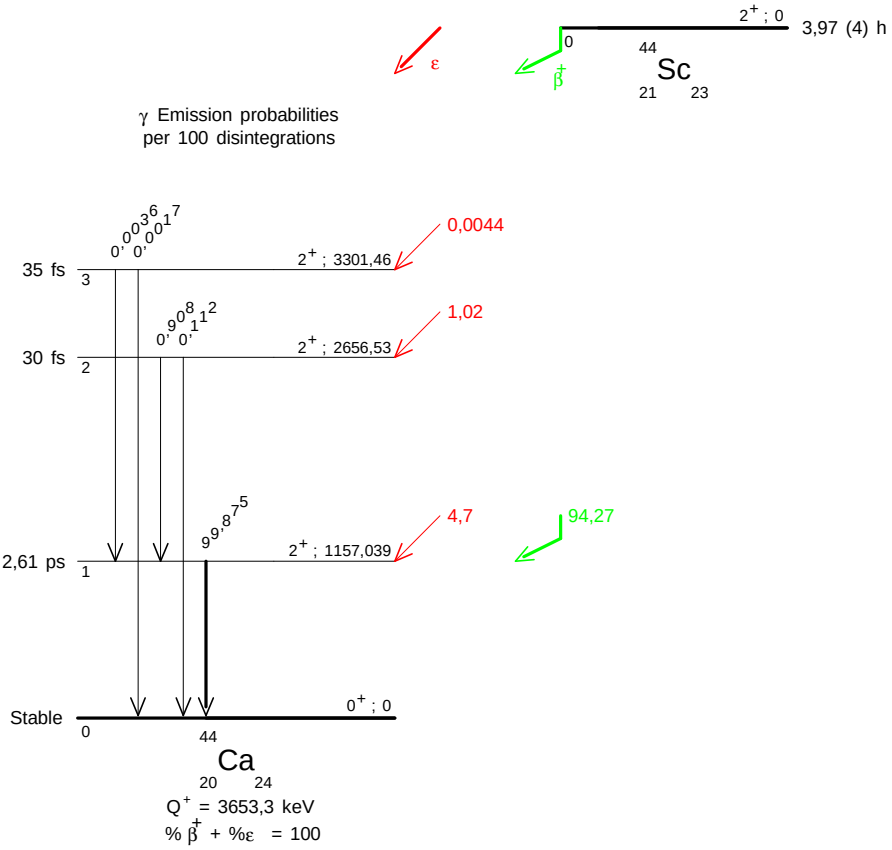
ε
β+
2+ ; 0
0
3,97 (4) h
44
Sc
21 23
γ Emission probabilities
per 100 disintegrations
0,0044
2+ ; 3301,46
35 fs
3
1,02
2+ ; 2656,53
30 fs
2
4,7
94,27
2+ ; 1157,039
2,61 ps
1
Stable
0+ ; 0
0
44
Ca
20 24
Q+ = 3653,3 keV
% β+ + %ε = 100