$^{46}_{21}\mathrm{Sc}_{25}$

1 Decay Scheme

Sc-46 disintegrates by 100% beta minus emission to excited levels in Ti-46.The main path (99.99%) leads to the 2009.8 keV level of Ti-46. The ground state of Ti-46 is reached via a gamma cascade of 1120.5 and 889.3 keV.

Le scandium 46 se désintègre à 100 % par émission bêta moins vers les niveaux excités du titane 46, dont 99,99 % vers le niveau de 2009,8 keV. Le niveau fondamental du titane 46 est atteint par une cascade gamma de 1120,5 et 889,3 keV.

2 Nuclear Data

$T_{1/2}(^{46}\mathrm{Sc})$	:	83,787	(16)	d
$Q^-(^{46}\mathrm{Sc})$	:	2366,5	(7)	keV

2.1 β^- Transitions

	Energy (keV)	Probability (%)	Nature	lg ft
$\beta^-_{0,2}$	356,7 (7)	99,98 (2)	Allowed	6,2
$\beta^-_{0,1}$	1477,2 (7)	0,02 (2)	2nd Forbidden	12,2

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K (10^{-4})	α_L (10^{-5})	α_M (10^{-6})	α_T (10^{-4})	α_π (10^{-6})
$\gamma_{1,0}$(Ti)	889,280 (2)	99,99999 (34)	E2	1,475 (21)	1,322 (19)	1,690 (24)	1,625 (23)	
$\gamma_{2,1}$(Ti)	1120,552 (3)	99,98 (2)	E2	0,839 (12)	0,750 (11)	0,959 (14)	0,941 (14)	1,692 (24)
$\gamma_{2,0}$(Ti)	2009,832 (4)	0,000013 (10)	E4	0,632 (9)	0,567 (8)	0,725 (11)	0,697 (10)	

3 Atomic Data

3.1 Ti

ω_K : 0,226 (5)
$\bar{\omega}_L$: 0,0032 (7)
n_{KL} : 1,566 (5)

3.1.1 X Radiations

		Energy (keV)	Relative probability
X_K			
	$K\alpha_2$	4,50491	50,76
	$K\alpha_1$	4,5109	100
	$K\beta_1$	4,93186	19,9757
	$K\beta_5''$	4,9623	
X_L			
	$L\ell$	0,3967	
	$L\alpha$	0,4556	
	$L\eta$	0,403	
	$L\beta$	0,46072 - 0,5614	
	$L\gamma$	0,46703 - 0,46703	

3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger K		
KLL	3,796 - 4,014	100
KLX	4,328 - 4,507	26,5
KXY	4,846 - 4,959	1,76
Auger L	0,3349 - 0,5596	

4 Electron Emissions

		Energy (keV)	Electrons (per 100 disint.)
e_{AL}	(Ti)	0,3349 - 0,5596	0,002072 (22)
e_{AK}	(Ti)		
	KLL	3,796 - 4,014	0,01791 (22)
	KLX	4,328 - 4,507	
	KXY	4,846 - 4,959	
$ec_{1,0\ K}$	(Ti)	884,314 (2)	0,01475 (21)
$\beta^-_{0,2}$	max:	356,7 (7)	99,98 (2)
	avg:	111,7 (3)	
$\beta^-_{0,1}$	max:	1477,2 (7)	0,02 (2)
	avg:	580,7 (3)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy (keV)	Photons (per 100 disint.)	
XL	(Ti)	0,3967 - 0,5614	0,00012 (3)	
$XK\alpha_2$	(Ti)	4,50491	0,00155 (4)	$K\alpha$
$XK\alpha_1$	(Ti)	4,5109	0,00306 (8)	
$XK\beta_1$	(Ti)	4,93186	0,000612 (18)	$K'\beta_1$
$XK\beta''_5$	(Ti)	4,9623		

5.2 Gamma Emissions

	Energy (keV)	Photons (per 100 disint.)
$\gamma^{\pm}$	511	0,000340 (4)
$\gamma_{1,0}$(Ti)	889,271 (2)	99,98374 (25)
$\gamma_{2,1}$(Ti)	1120,537 (3)	99,97 (2)
$\gamma_{2,0}$(Ti)	2009,785 (4)	0,000013 (10)

6 Main Production Modes

$Sc - 46m(IT)Sc - 46$

$Ca - 43(\alpha,p\gamma)Sc - 46$

$Ca - 44(He - 3,p)Sc - 46$

$Sc - 45(n,\gamma)Sc - 46$

$Sc - 45(d,p)Sc - 46$

$Sc - 45(t,d)Sc - 46$

$Ca - 46(He - 3,t)Sc - 46$

$Ti - 46(t,He - 3)Sc - 46$

$Ti - 47(d,He - 3)Sc - 46$

$Ti - 48(p,He - 3)Sc - 46$

$Ti - 48(d,\alpha)Sc - 46$

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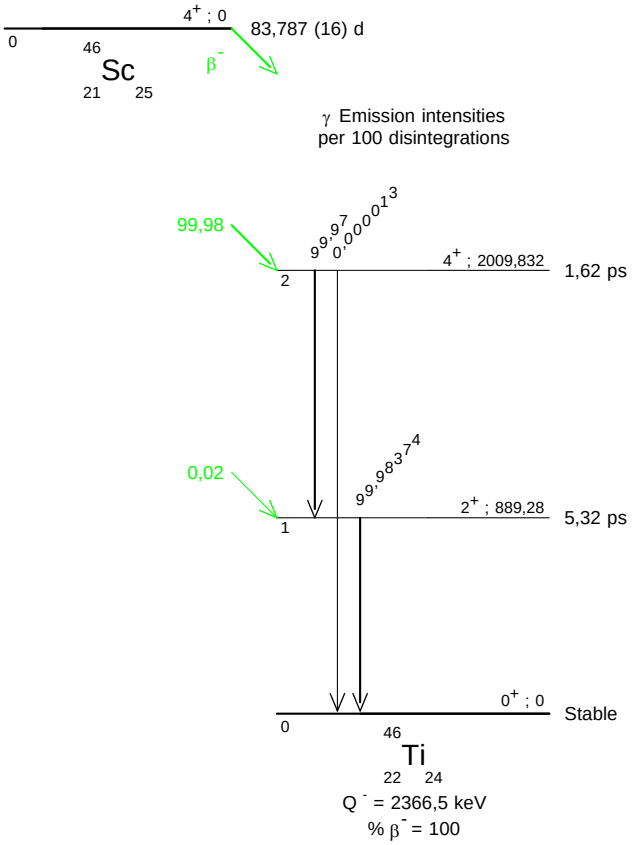
4+ ; 0
83,787 (16) d
0
46
Sc
21
25
β-
γ Emission intensities
per 100 disintegrations
99,98
99,99,97,00,00,01,3
4+ ; 2009,832
1,62 ps
2
0,02
99,98,83,74
2+ ; 889,28
5,32 ps
1
0+ ; 0
Stable
0
46
Ti
22
24
Q - = 2366,5 keV
% β- = 100