



## 1 Decay Scheme

Nb-93m disintegrates by 100% gamma transition to the ground state of the stable nuclide Nb-93.  
*Le niobium 93m se désexcite à 100 % par transition gamma vers le noyau stable de niobium 93.*

## 2 Nuclear Data

$$T_{1/2}(^{93\text{m}}\text{Nb}) : 16,12 \quad (15) \quad \text{a}$$

$$Q^{IT}(^{93\text{m}}\text{Nb}) : 30,77 \quad (2) \quad \text{keV}$$

### 2.1 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	$\alpha_K$ ( $10^5$ )	$\alpha_L$ ( $10^5$ )	$\alpha_M$ ( $10^5$ )	$\alpha_T$ ( $10^5$ )
$\gamma_{1,0}(\text{Nb})$	30,77 (2)	100	M4	0,260 (4)	1,151 (17)	0,249 (4)	1,693 (25)

### 3 Atomic Data

#### 3.1 Nb

$\omega_K$	:	0,751	(4)
$\bar{\omega}_L$	:	0,0347	(9)
$n_{KL}$	:	1,045	(4)

##### 3.1.1 X Radiations

	Energy (keV)	Relative probability
X <sub>K</sub>		
K $\alpha_2$	16,5213	52,36
K $\alpha_1$	16,6152	100
K $\beta_3$	18,607	} 25,8
K $\beta_1$	18,623	
K $\beta_5''$	18,78	
K $\beta_2$	18,952	} 3,86
K $\beta_4$	18,982	
X <sub>L</sub>		
L $\ell$	1,9	
L $\alpha$	2,16 - 2,17	
L $\eta$	2	
L $\beta$	2,26 - 2,37	
L $\gamma$	2,41 - 2,67	

##### 3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger K		
KLL	13,49 - 14,14	100
KLX	15,79 - 16,58	39,1
KXY	18,02 - 18,91	3,81
Auger L		
	1,4 - 2,6	

## 4 Electron Emissions

		Energy (keV)	Electrons (per 100 disint.)		
e <sub>AL</sub>	(Nb)	1,4 - 2,6	81,25 (28)		
e <sub>AK</sub>	(Nb)	KLL 13,49 - 14,14 KLX 15,79 - 16,58 KXY 18,02 - 18,91	3,83 (11)		
ec <sub>1,0 T</sub>	(Nb)			11,78 - 30,77	99,999409 (9)
ec <sub>1,0 K</sub>	(Nb)			11,78 (2)	15,37 (33)
ec <sub>1,0 L</sub>	(Nb)	28,07 - 28,40	68,0 (14)		
ec <sub>1,0 M</sub>	(Nb)	30,30 - 30,57	14,72 (33)		
ec <sub>1,0 N</sub>	(Nb)	30,71 - 30,77	1,91 (4)		

## 5 Photon Emissions

### 5.1 X-Ray Emissions

		Energy (keV)	Photons (per 100 disint.)	
XL	(Nb)	1,9 - 2,67	2,88 (6)	
XK $\alpha_2$	(Nb)	16,5213	3,32 (8)	} K $\alpha$
XK $\alpha_1$	(Nb)	16,6152	6,34 (15)	
XK $\beta_3$	(Nb)	18,607	1,64 (4)	} K' $\beta_1$
XK $\beta_1$	(Nb)	18,623		
XK $\beta_5''$	(Nb)	18,78		
XK $\beta_2$	(Nb)	18,952	0,246 (11)	} K' $\beta_2$
XK $\beta_4$	(Nb)	18,982		

### 5.2 Gamma Emissions

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{1,0}(\text{Nb})$	30,77 (2)	0,000591 (9)

## 6 Main Production Modes

- { Nb – 93(n,n')Nb – 93m
- { Possible impurities : Nb – 92m, Nb – 94, Nb – 95
- Mo – 92(n,γ)Mo – 93
- { Separation from Zr – 93 + Nb – 93m (Fission products)
- { Possible impurities : Nb – 94
- Mo – 93(EC)Nb – 93m

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