



## 1 Decay Scheme

Le technétium 99 se désintègre par émission bêta moins principalement vers le niveau fondamental de Ru-99. Une transition bêta de faible intensité vers le niveau excité de 89,52 keV a été mise en évidence.

*Technetium 99 disintegrates by beta minus emission predominately to Ru-99 ground state, and very weakly to an 89,52 keV excited level.*

## 2 Nuclear Data

$$T_{1/2}(^{99}\text{Tc}) : 211,5 \quad (11) \quad 10^3 \text{ a}$$

$$Q^-(^{99}\text{Tc}) : 293,8 \quad (14) \quad \text{keV}$$

### 2.1 $\beta^-$ Transitions

	Energy keV	Probability $\times 100$	Nature	lg $ft$
$\beta_{0,1}^-$	204,3 (14)	0,00145 (30)	Unique 2nd Forbidden	15,8
$\beta_{0,0}^-$	293,8 (14)	99,99855 (30)	2nd Forbidden	12,3

### 2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	$\alpha_K$	$\alpha_L$	$\alpha_M$	$\alpha_T$
$\gamma_{1,0}(\text{Ru})$	89,52 (51)	0,00145 (30)	M1+71,0(5)%E2	1,173 (19)	0,265 (5)	0,0497 (9)	1,495 (25)

## 2.3 Ru

$\omega_K$	:	0,796	(4)
$\bar{\omega}_L$	:	0,0453	(11)
$\bar{\omega}_M$	:	0,0019	
$n_{KL}$	:	1,000	(4)

### 2.3.1 X Radiations

		Energy keV	Relative probability	
X <sub>K</sub>	K $\alpha_2$	19,1506		52,7
	K $\alpha_1$	19,2794		100
	K $\beta_3$	21,6349	}	
	K $\beta_1$	21,6565	}	
	K $\beta_5''$	21,832	}	26,9
	K $\beta_2$	22,074	}	
	K $\beta_4$	22,104	}	4,4
X <sub>L</sub>	L $\ell$	2,2538		
	L $\alpha$	2,5542 – 2,5591		
	L $\eta$	2,3826		
	L $\beta$	2,6831 – 2,9436		
	L $\gamma$	2,8959 – 3,1825		

### 2.3.2 Auger Electrons

		Energy keV	Relative probability
Auger K			
	KLL	15,565 – 16,329	100
	KLX	18,267 – 19,277	40,9
	KXY	20,947 – 22,113	4,18
Auger L			
		1,75 – 3,12	

3 Electron Emissions

		Energy keV	Electrons per 100 disint.
e <sub>AL</sub>	(Ru)	1,75 - 3,12	0,00080 (4)
e <sub>AK</sub>	(Ru)		0,000139 (27)
	KLL	15,565 - 16,329	}
	KLX	18,267 - 19,277	}
	KXY	20,947 - 22,113	}
β <sup>-</sup> <sub>0,1</sub>	max:	204,3 (14)	0,00145 (30)
β <sup>-</sup> <sub>0,1</sub>	avg:		
β <sup>-</sup> <sub>0,0</sub>	max:	293,8 (14)	99,99855 (30)
β <sup>-</sup> <sub>0,0</sub>	avg:	94,6 (17)	

4 Photon Emissions

4.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.
XL	(Ru)	2,2538 — 3,1825	0,000039 (4)
XKα <sub>2</sub>	(Ru)	19,1506	0,000155 (30) } Kα
XKα <sub>1</sub>	(Ru)	19,2794	0,00029 (6) }
XKβ <sub>3</sub>	(Ru)	21,6349	}
XKβ <sub>1</sub>	(Ru)	21,6565	}
XKβ <sub>5</sub> ''	(Ru)	21,832	}
XKβ <sub>2</sub>	(Ru)	22,074	}
XKβ <sub>4</sub>	(Ru)	22,104	}
			0,0000128 (25) Kβ <sub>2</sub> '

4.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
γ <sub>1,0</sub> (Ru)	89,52 (15)	0,00058 (11)

## 5 Main Production Modes

Mo – 98(n,γ)Mo – 99      σ : 0,130 (6) barns

Mo – 99(β<sup>−</sup>)Tc – 99

$T_{1/2} = 66h$

Fission product.

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