$^{55}_{26}\mathrm{Fe}_{29}$

1 Decay Scheme

Fe-55 disintegrates by electron capture. A gamma transition with a small probability ($1{,}3 \times 10^{-7}$ %) has been observed. A background radiation, due to an inner-bremsstrahlung, with an intensity relative to K capture of $3{,}24(6) \times 10^{-5}$ photons produces a continuous spectrum up to 231,21 keV.

Le Fe-55 se désintègre par capture électronique. Une transition gamma de faible probabilité a été observée. Un rayonnement de freinage interne produit une émission radiative, dont la probabilité relative à la capture électronique K est de $3{,}24(6) \times 10^{-5}$.

2 Nuclear Data

$T_{1/2}(^{55}\mathrm{Fe})$	:	2,747	(8)	a
$Q^+(^{55}\mathrm{Fe})$	:	231,21	(18)	keV

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg ft	P_K	P_L	P_{M+}
$\epsilon_{0,1}$	105,26 (18)	0,00000013 (1)	2nd Forbidden	14,2			
$\epsilon_{0,0}$	231,21 (18)	100	Allowed	6	0,8853 (16)	0,0983 (13)	0,0163 (8)

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity
$\gamma_{1,0}$(Mn)	125,949 (10)	0,00000013 (1)	M1+(E2)

3 Atomic Data

3.1 Mn

ω_K	:	0,321	(7)
$\bar{\omega}_L$	:	0,0047	(7)
$\bar{\omega}_M$	:	0,000027	(2)
n_{KL}	:	1,478	(4)
$\bar{n}_{LM}$	:	1,996	(8)

3.1.1 X Radiations

		Energy keV		Relative probability
X_K				
	$K\alpha_2$	5,88765		51
	$K\alpha_1$	5,89875		100
	$K\beta_3$	6,49045	}	
	$K\beta_5''$	6,5352	}	20,5
X_L				
	$L\ell$	0,556		
	$L\eta$	0,567		
	$L\beta$	0,649 – 0,721		

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	4,953 – 5,210	100
KLX	5,671 – 5,895	27,2
KXY	6,370 – 6,532	1,85
Auger L	0,47 – 0,67	

4 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Mn)	0,47 - 0,67	140,2 (8)
e_{AK}	(Mn)		60,1 (5)
	KLL	4,953 - 5,210	}
	KLX	5,671 - 5,895	}
	KXY	6,370 - 6,532	}

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Mn)	0,556 — 0,721	0,524 (21)	
XKα_2	(Mn)	5,88765	8,45 (14)	} Kα
XKα_1	(Mn)	5,89875	16,57 (27)	}
XKβ_3	(Mn)	6,49045	}	
XKβ_1	(Mn)		} 3,40 (7)	K$'\beta_1$
XKβ''_5	(Mn)	6,5352	}	
XKβ_4	(Mn)		}	K$'\beta_2$

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
$\gamma_{1,0}$(Mn)	125,949 (10)	0,00000013 (1)

6 Main Production Modes

$\left\{ \begin{array}{l} \mathrm{Fe-54(n,\gamma)Fe-55} \qquad \sigma : 2{,}25\ (1800)\ \text{barns} \\ \text{Possible impurities :}\ \mathrm{Fe-59} \end{array} \right.$

$\mathrm{Mn-55(p,n)Fe-55}$

$\left\{ \begin{array}{l} \mathrm{Fe-54(d,p)Fe-55} \\ \text{Possible impurities :}\ \mathrm{Co-55} \end{array} \right.$

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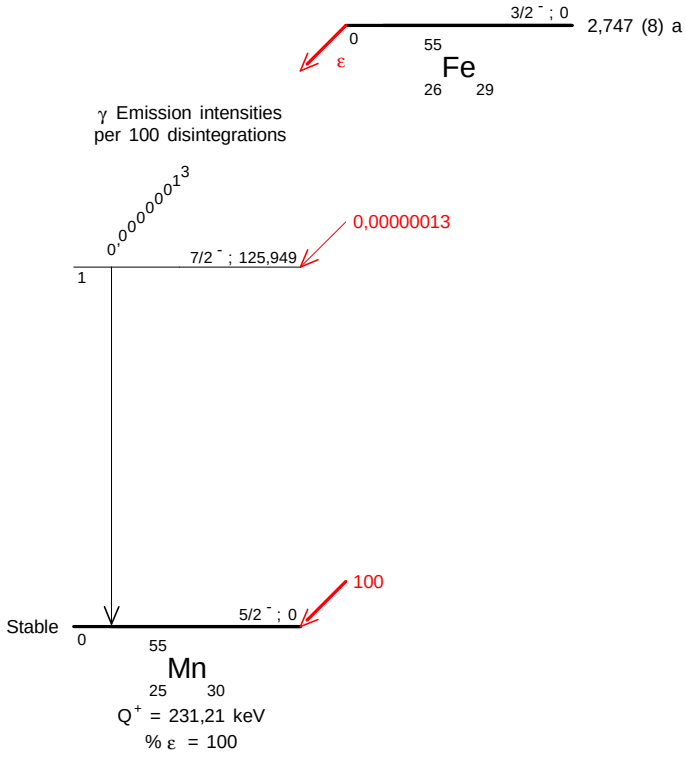
3/2 - ; 0
2,747 (8) a
0
55
ε
Fe
26 29
γ Emission intensities
per 100 disintegrations
0,00000013
7/2 - ; 125,949
1
100
5/2 - ; 0
Stable
0
55
Mn
25 30
Q+ = 231,21 keV
% ε = 100