



1 Decay Scheme

Co-57 decays 100% by electron capture to the excited levels of 706.42 keV (0.183%) and 136.47 keV (99.80%) in Fe-57.

Le cobalt-57 se désintègre par capture électronique vers des niveaux excités du fer-57.

2 Nuclear Data

$T_{1/2}({}^{57}\text{Co})$: 271,81 (4) d
 $Q^+({}^{57}\text{Co})$: 836,2 (5) keV

2.1 Electron Capture Transitions

	Energy (keV)	Probability (%)	Nature	lg ft	P_K	P_L	P_M
$\epsilon_{0,4}$	129,8 (5)	0,183 (7)	Allowed	7,69	0,8789 (17)	0,1035 (14)	0,0168 (6)
$\epsilon_{0,3}$	469,4 (5)	<0,002	2nd Forbidden	>10,8			
$\epsilon_{0,2}$	699,7 (5)	99,80 (23)	Allowed	6,45	0,8875 (16)	0,0963 (14)	0,0154 (5)
$\epsilon_{0,1}$	821,8 (5)	<0,0003	2nd Forbidden	>11,1			
$\epsilon_{0,0}$	836,2 (5)	<0,00035	Unique 2nd Forbidden	>12,9			

2.2 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	$P_{\gamma+ce}$ (%)	Multipolarity	α_K	α_L	α_M	α_T
$\gamma_{1,0}(\text{Fe})$	14,41295 (31)	87,67 (15)	M1+0,0005%E2	7,65 (11)	0,787 (11)	0,1082 (16)	8,55 (12)
$\gamma_{2,1}(\text{Fe})$	122,06079 (42)	87,51 (15)	M1+1,37%E2	0,0212 (3)	0,00211 (3)	0,000290 (5)	0,0236 (4)
$\gamma_{2,0}(\text{Fe})$	136,47374 (29)	12,30 (17)	E2	0,1331 (19)	0,01371 (20)	0,00187 (3)	0,1487 (21)
$\gamma_{3,2}(\text{Fe})$	230,27 (3)	0,0004 (4)	M1+0,04%E2	0,00375 (6)	0,000364 (5)	0,0000501 (7)	0,00416 (6)
$\gamma_{4,3}(\text{Fe})$	339,67 (3)	0,00381 (40)	M1+0,68%E2	0,001494 (21)	0,0001439 (21)	0,0000198 (3)	0,001659 (24)
$\gamma_{3,1}(\text{Fe})$	352,34 (2)	0,0032 (4)	M1+0,06%E2	0,001354 (19)	0,0001303 (19)	0,0000180 (3)	0,001503 (22)
$\gamma_{3,0}(\text{Fe})$	366,74 (3)	0,0013 (4)	M1+16,84%E2	0,00160 (8)	0,000155 (8)	0,0000213 (10)	0,00178 (9)

	Energy (keV)	P _{γ+ce} (%)	Multipolarity	α _K	α _L	α _M	α _T
γ _{4,2} (Fe)	569,94 (4)	0,015 (2)	M1+0,93%E2	0,000460 (7)	0,0000440 (7)	0,00000606 (9)	0,000510 (8)
γ _{4,1} (Fe)	692,01 (2)	0,159 (6)	M1+17,78%E2	0,000329 (5)	0,0000315 (5)	0,00000433 (7)	0,000365 (6)
γ _{4,0} (Fe)	706,42 (2)	0,0050 (5)	E2	0,000435 (6)	0,0000418 (6)	0,00000575 (8)	0,000483 (7)

3 Atomic Data

3.1 Fe

ω _K	:	0,355	(4)
ω _L	:	0,0060	(6)
n _{KL}	:	1,447	(4)

3.1.1 X Radiations

	Energy (keV)	Relative probability
X _K		
Kα ₂	6,39091	51,07
Kα ₁	6,40391	100
Kβ ₁	7,05804	} 20,66638
Kβ ₅ ''	7,1083	
X _L		
Lℓ	0,617	
Lα	0,7075 - 0,7084	
Lη	0,6306	
Lβ	0,7148 - 0,7938	
Lγ	0,72841 - 0,72841	

3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger K		
KLL	5,370 - 5,645	100
KLX	6,158 - 6,400	27,4
KXY	6,926 - 7,105	1,87
Auger L	0,5223 - 0,8421	

4 Electron Emissions

		Energy (keV)	Electrons (per 100 disint.)
e _{AL}	(Fe)	0,5223 - 0,8421	250,6 (16)
e _{AK}	(Fe)		
	KLL	5,370 - 5,645	} 104,6 (11)
	KLX	6,158 - 6,400	
	KXY	6,926 - 7,105	
ec _{1,0} K	(Fe)	7,30095 (31)	70,2 (14)
ec _{1,0} T	(Fe)	7,3010 - 14,4126	78,5 (15)
ec _{1,0} L	(Fe)	13,5668 - 13,7048	7,22 (14)
ec _{1,0} M	(Fe)	14,3200 - 14,4094	0,993 (20)
ec _{1,0} N	(Fe)	14,4126 - 14,4126	0,0431 (9)
ec _{2,1} K	(Fe)	114,94879 (42)	1,812 (26)
ec _{2,1} T	(Fe)	114,9490 - 122,0604	2,018 (34)
ec _{2,1} L	(Fe)	121,2147 - 121,3527	0,1804 (26)
ec _{2,1} M	(Fe)	121,9679 - 122,0572	0,02479 (43)
ec _{2,0} K	(Fe)	129,36174 (29)	1,426 (29)
ec _{2,0} T	(Fe)	129,3620 - 136,4733	1,593 (32)
ec _{2,0} L	(Fe)	135,6276 - 135,7656	0,1468 (30)
ec _{2,0} M	(Fe)	136,3808 - 136,4701	0,02003 (43)

5 Photon Emissions

5.1 X-Ray Emissions

		Energy (keV)	Photons (per 100 disint.)	
XL	(Fe)	0,617 - 0,7938	1,30 (4)	
XK α_2	(Fe)	6,39091	17,12 (26)	} K α
XK α_1	(Fe)	6,40391	33,5 (5)	
XK β_1	(Fe)	7,05804	} 6,93 (13)	K' β_1
XK β_5''	(Fe)	7,1083		

5.2 Gamma Emissions

		Energy (keV)	Photons (per 100 disint.)
$\gamma_{1,0}$ (Fe)		14,41295 (31)	9,18 (12)

	Energy (keV)	Photons (per 100 disint.)
$\gamma_{2,1}(\text{Fe})$	122,06065 (12)	85,49 (14)
$\gamma_{2,0}(\text{Fe})$	136,47356 (29)	10,71 (15)
$\gamma_{3,2}(\text{Fe})$	230,27 (3)	0,0004 (4)
$\gamma_{4,3}(\text{Fe})$	339,67 (3)	0,0038 (4)
$\gamma_{3,1}(\text{Fe})$	352,34 (2)	0,0032 (4)
$\gamma_{3,0}(\text{Fe})$	366,74 (3)	0,0013 (4)
$\gamma_{4,2}(\text{Fe})$	569,94 (4)	0,015 (2)
$\gamma_{4,1}(\text{Fe})$	692,01 (2)	0,159 (6)
$\gamma_{4,0}(\text{Fe})$	706,415 (20)	0,0050 (5)

6 Main Production Modes

- { Ni – 60(p, α)Co – 57
Possible impurities: Co – 56, Co – 58
- { Ni – 58(p,2p)Co – 57
Possible impurities: Co – 56, Co – 58
- { Fe – 56(d,n)Co – 57
Possible impurities: Co – 56, Co – 58

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