

⁶⁰Fe β⁻ decay [1957Ro54,2009Ru08](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 114, 1849 (2013)	31-Dec-2012

Parent: ⁶⁰Fe: E=0; J^π=0⁺; T_{1/2}=2.62×10⁶ y 4; Q(β⁻)=237 3; %β⁻ decay=100.0

⁶⁰Fe-Q(β⁻): from [2012Wa38](#).

⁶⁰Fe-T_{1/2}: from [2009Ru08](#), by measuring three quantities in the same sample: activity of ⁶⁰Fe, the isotopic composition (ratio of number of ⁶⁰Fe and Fe atoms), and the number of iron atoms in the sample.

⁶⁰Fe-%β⁻ decay: From [1963Sc14](#).

Additional information 1.

[1957Ro54](#): From proton-induced spallation of copper at E(p)=400 MeV. Measured T_{1/2}. Chemical analysis, Geiger-Muller counter.

Assignment of activity to ⁶⁰Fe is uncertain.

[2009Ru08](#): ⁶⁰Fe isotope was chemically extracted in 2004 from a Cu beam dump, used at Paul Scherrer Institute, in which 3.6×10²¹ 590-MeV protons had been stopped between 1980 and 1992. Measured half-life of ⁶⁰Fe from number of atoms of ⁶⁰Fe and their activity in a sample containing over 10¹⁵ ⁶⁰Fe atoms. Sample activity was measured by γ-ray spectroscopy in a low-background environment.

Eβ=135 keV, Eγ=27 and 59 keV reported by [1960Me09](#).

⁶⁰Co Levels

E(level)	J ^π †	T _{1/2} †	Comments
0.0	5 ⁺	5.2712 y 4	
58.603 7	2 ⁺	10.467 min 6	%IT=99.75 3 T _{1/2} : From 1963Sc14 .

† From Adopted Levels.

β⁻ radiations

E(decay)	E(level)	Iβ ⁻ †	Log ft	Comments
(178 3)	58.603	100	12.3	av Eβ= 50.2 10

† Absolute intensity per 100 decays.

γ(⁶⁰Co)

E _γ	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	δ	α†	I _(γ+ce) ‡	Comments
58.603 7	58.603	2 ⁺	0.0	5 ⁺	M3+(E4)	<0.02	47.3	99.75 3	α(K)=39.4 6; α(L)=6.86 12; α(M)=0.966 16; α(N+..)=0.0310 5 α(N)=0.0310 5 ce(N)/(γ+ce)=0.000641 13 %Iγ=2.07 3, %I(γ+ce)=99.75 3. I _γ : I _γ is given at equilibrium of ^{60m} Co(10.467 min) with ⁶⁰ Fe(2.62×10 ⁶ y). E(γ),Mult.,δ,α,I(γ+ce) from Adopted Levels, Gammas.

† [Additional information 2.](#)

‡ Absolute intensity per 100 decays.

${}^{60}\text{Fe}$ β^- decay 1957Ro54,2009Ru08Decay Scheme