

⁶²Cr β⁻ decay (206 ms) 2005Ga01,2003So02,1999So20

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Alan L. Nichols, Balraj Singh, Jagdish K. Tuli		NDS 113, 973 (2012)	15-Apr-2012

Parent: ⁶²Cr: E=0.0; J^π=0⁺; T_{1/2}=206 ms 12; Q(β⁻)=7.77×10³ 34; %β⁻ decay=100.0

⁶²Cr-T_{1/2}: From Adopted Levels.

⁶²Cr-Q(β⁻): From 2011AuZZ. 2003Au03 list 7620 400.

All papers are from the same group at GANIL.

⁶²Cr produced in fragmentation of ⁷⁶Ge³⁰⁺ beam on a ⁵⁸Ni target. LISE3 doubly achromatic spectrometer used to separate fragments, with magnetic rigidity tuned to optimize transmission of ⁶²V and ⁶⁴Cr fragments. Transmitted nuclei were identified by three consecutive Si detectors (300, 300 and 1500 microns); first two served for energy loss and time-of-flight measurements, while the last determined their residual energies.

Measured E_γ, I_γ, I_β, γγ, βγ coin., γ(t), lifetimes with four Ge detectors placed around a thick Si telescope. Half-lives determined by fitting procedure involving five parameters: half-lives of mother, daughter and grand-daughter nuclei, the β-efficiency and the background rate over the counting time.

All data are from 2005Ga01, unless otherwise stated.

The decay scheme is poorly known.

Total decay energy of 1140 keV 3 deduced (by RADLIST code) from proposed decay scheme is much lower than the expected value of 7770 keV 340, indicating that decay scheme is incomplete.

⁶²Mn Levels

E(level) [†]	J ^π [‡]	T _{1/2} [‡]	Comments
0+x	(1 ⁺)	92 ms 13	
285.0+x 17	(0 ⁺ ,2 ⁺)		
640.0+x 17	(1 ⁺)		
1500+x? 3			E(level): 2005Ga01 propose the existence of this level and its de-exciting 1215 γ ray based upon the difference in intensities of the 355 and 285 transitions, which indicates an additional β-decay branch to the 285 level. The observed 1215γ transition accounts for the missing intensity.

[†] 2005Ga01 could not distinguish which of the two low-spin β-decaying isomers observed is the ground state; the shorter-lived state was presumed to be the isomer. However, systematics as discussed in Adopted Levels suggest that 92-ms activity is likely to be the g.s.

[‡] From Adopted Levels.

β⁻ radiations

E(decay)	E(level)	I _{β⁻} [†]	Log ft	Comments
(3×10 ³ [‡] 3)	1500+x?	3	5.3	
(4×10 ³ [‡] 4)	640.0+x	≈25	≈4.4	I _{β⁻} : from text of 2005Ga01; I _{β⁻} <25% given in authors' decay scheme (Figure 5).
(4×10 ³ [‡] 4)	0+x	≈72	≈4.2	I _{β⁻} : from balance of I _{β⁻} in 2005Ga01; 73(5)% given in text, and I _{β⁻} <75% given in authors' decay scheme (Figure 5). Value deduced from lack of observation of any other γ ray in ⁶² Cr decay.

[†] Absolute intensity per 100 decays.

[‡] Estimated for a range of levels.

$^{62}\text{Cr} \beta^-$ decay (206 ms) 2005Ga01,2003So02,1999So20 (continued) $\gamma(^{62}\text{Mn})$

E_γ^\dagger	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
$^{x156} 2$					
285 2	100	285.0+x	(0 ⁺ ,2 ⁺)	0+x	(1 ⁺)
355 2	85	640.0+x	(1 ⁺)	285.0+x	(0 ⁺ ,2 ⁺)
640 2	58	640.0+x	(1 ⁺)	0+x	(1 ⁺)
$1215^{\ddagger} 2$	15	1500+x?		285.0+x	(0 ⁺ ,2 ⁺)

[†] Uncertainty assigned by evaluators on the basis of the standard uncertainty of 2 keV for all other gammas observed by 2005Ga01.

[‡] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

 $^{62}\text{Cr} \beta^-$ decay (206 ms) 2005Ga01,2003So02,1999So20Decay SchemeIntensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - -→ γ Decay (Uncertain)
- Coincidence

