$^{62}{\rm Cr}\,\beta^-$ decay (200 ms) 2005Ga01,2003So02,1999So20

History										
Type	Author	Citation	Literature Cutoff Date							
Full Evaluation	Balraj Singh, Huang Xiaolong, and Wang Xianghan	NDS 204,1 (2025)	30-Jun-2023							

Parent: 62 Cr: E=0.0; J $^{\pi}$ =0+; T_{1/2}=200 ms 12; Q(β -)=7671 7; % β - decay=100

⁶²Cr-T_{1/2}: From ⁶²Cr Adopted Levels.

All the 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 , $\gamma\gamma$, $\beta\gamma$ coin., $\gamma(t)$, 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.

62Mn Levels

E(level)[†] $\frac{J^{\pi \ddagger}}{0.0}$ $\frac{T_{1/2}^{\ddagger}}{1^{+}}$ $\frac{T_{1/2}^{\ddagger}}{92 \text{ ms } 13}$ 285.0 17 (0⁺) 640.0 17 (1⁺) 1500? 3

Comments

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 1215 γ transition accounts for the missing intensity.

β^- radiations

E(decay)	E(level)	$\mathrm{I}\beta^{-\dagger}$	Log ft	Comments
(6171 8)	1500?	<3	>5.2	av E β =2821.5 39 I β ⁻ : from text of 2005Ga01.
(7031 7)	640.0	<25	>4.5	av Eβ=3240.6 34
(7671 7)	0.0	<72	>4.3	$I\beta^-$: from text of 2005Ga01; I_β <25% given in authors' decay scheme Fig. 5. av $E\beta$ =3552.7 34 $I\beta^-$: from balance of I_β in 2005Ga01; 73% 5 given in text, and I_β <75% given in authors' decay scheme Fig. 5. Value deduced from lack of observation of any other γ ray in 62 Cr decay.

[†] Absolute intensity per 100 decays.

 γ (62Mn)

The decay scheme is incomplete. No γ -normalization is possible.

[†] From Ey data. 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 the Adopted Levels suggest that 92-ms activity is likely to be the g.s.

[‡] From Adopted Levels.

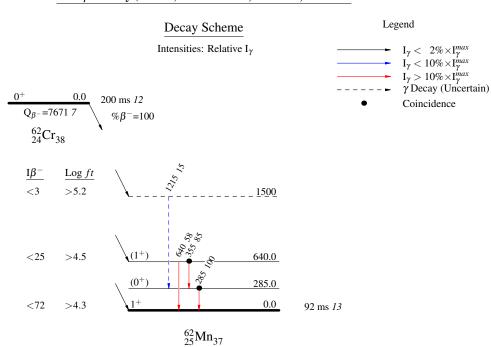
$^{62}{\rm Cr}\,\beta^-$ decay (200 ms) 2005Ga01,2003So02,1999So20 (continued)

γ (62Mn) (continued)

E_{γ}^{\dagger}	I_{γ}	$E_i(level)$	\mathbf{J}_i^{π}	\mathbf{E}_f	\mathbf{J}_f^{π}
^x 156 2					
285 2	100	285.0	(0^+)	0.0	1+
355 2	85	640.0	(1^+)	285.0	(0^+)
640 2	58	640.0	(1^{+})	0.0	1+
1215‡ 2	15	1500?		285.0	(0^+)

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

⁶²Cr β⁻ decay (200 ms) 2005Ga01,2003So02,1999So20



 $^{^{\}ddagger}$ Placement of transition in the level scheme is uncertain.

 $^{^{}x}$ γ ray not placed in level scheme.