

$^1\text{H}(^{63}\text{V},2\text{p}\gamma)$ 2020Co01

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

2020Co01: $E(^{63}\text{V}) \approx 200$ MeV/nucleon, secondary ^{63}V beam from $^9\text{Be}(^{70}\text{Zn},\text{X}), E=345$ MeV/nucleon primary reaction followed by separation of fragments of interest event-by-event using BigRIPS spectrometer at RIBF-RIKEN. Measured yields of reaction products with $E\gamma$, $I\gamma$, $\gamma\gamma$ -coin, cross sections for population of levels in ^{62}Ti using MINOS device, SAMURAI dipole magnet, Time Projection Chamber (TPC), and DALI2⁺ array of 226 NaI(Tl) detectors. A total of 1880 events corresponding to the production of ^{62}Ti reaction were observed. Deduced first 2⁺ and 4⁺ levels. Gamma-ray spectra were Doppler corrected. Comparison with large-scale shell model (LSSM) calculations, using symmetry conserving configuration mixing (SCCM) and Gogny D1S effective interaction, and valence-space in-medium similarity renormalization group (VS-IMSRG).

 ^{62}Ti Levels

$E(\text{level})^\dagger$	J^π^\ddagger	Comments
0	0 ⁺	Exclusive $\sigma=1.4$ mb 4, from subtraction of σ for observed transitions from the measured inclusive σ (2020Co01).
683 10	(2 ⁺)	Measured exclusive $\sigma=1.3$ mb 4 (2020Co01), assuming 100% or no feeding by the unplaced 1222 and 1328 γ rays.
1506 22	(4 ⁺)	Measured exclusive $\sigma=0.8$ mb 1 (2020Co01).

[†] From $E\gamma$ values.

[‡] As given in Fig. 2a of 2020Co01, based on level-energy and J^π systematics in the neighboring even-even nuclides with N=40 and Z=20-32, and also from model calculations.

 $\gamma(^{62}\text{Ti})$

E_γ	I_γ	$E_i(\text{level})$	J^π_i	E_f	J^π_f	Comments
^x 320						Tentative peak observed with 1 σ significance level, but not included in cross section determinations (2020Co01).
683 10	1.3 4	683	(2 ⁺)	0	0 ⁺	
823 20	0.8 1	1506	(4 ⁺)	683	(2 ⁺)	
^x 1222 37	0.2 1					This peak observed with 2 σ significance level. Measured exclusive $\sigma=0.2$ mb 1 (2020Co01).
^x 1328 45	0.3 1					This peak observed with 3 σ significance level. Measured exclusive $\sigma=0.3$ mb 1 (2020Co01).

^x γ ray not placed in level scheme.

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Level Scheme

Intensities: Measured cross sections in mb

Legend

- \longrightarrow $I_\gamma < 2\% \times I_\gamma^{max}$
- \longrightarrow $I_\gamma < 10\% \times I_\gamma^{max}$
- \longrightarrow $I_\gamma > 10\% \times I_\gamma^{max}$

