Adopted Levels, Gammas

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

Q(β^-)=13010 *syst*; S(n)=3900 *syst*; S(p)=19900 *syst*; Q(α)=−13090 *syst* 2021Wa16

Estimated uncertainties (2021Wa16): 480 for Q(β^-), 500 for S(n), 720 for S(p), 640 for Q(α).

S(2n)=6240 *470*, S(2p)=37780 *810*, Q(β^-n)=9910 *460* (syst,2021Wa16). Q(β^-2n)=4750 *440*, Q(β^-3n)=1200 *420* (syst, deduced by evaluator from relevant mass excesses in 2021Wa16).

2009Ta24, 2009Ta05: ^{62}Ti identified by fragmentation of ^{76}Ge beam at 132 MeV/nucleon with Be and W targets at NSCL facility using A1900 fragment separator combined with S800 analysis beam line to form a two- stage separator system. The transmitted fragments were analyzed event-by-event in terms of momentum and particle identification. The nuclei of interest were stopped in eight Si PIN diodes (50x50 mm^2) which provided measurement of energy loss, nuclear charge and total kinetic energy. The time-of-flight of each particle that reached the detector stack was measured in four different ways using plastic scintillators, Si detectors, and parallel-plate avalanche counters. The simultaneous measurement of ΔE signals, magnetic rigidity, total kinetic energy and time-of-flight (ToF) provided unambiguous identification of the atomic number, charge state and mass number.

2020Mi13: measured mass excess using time-of-flight magnetic-rigidity technique at RIBF-RIKEN facility.

Theoretical nuclear structure calculations:

2022Ho02: calculated quadrupole deformation parameter β_2, S(2n), rms matter radius, hexadecapole deformation parameter β_4, difference of the charge square radii, diffuseness parameters, occupation of highly elongated intruder orbitals and effect on quadrupole and hexadecapole deformations using Skyrme-Hartree-Fock method in three-dimensional coordinate space.

2022Ko04: calculated ground state energy, charge rms radius using coupled cluster (CC) and ab-initio density functional theory, extended to open-shell deformed nuclei.

2022Ya23: theory: structure: calculated binding energy, charge radius, quadrupole deformation, and pairing energy using relativistic mean-field (RMF) formalism.

2021Co14: calculated S(2n), energy of the first 2^+ state, effective single-particle energies (ESPEs), neutron-neutron monopole matrix elements using shell-model with an effective Hamiltonian from many-body perturbation theory using ^{40}Ca as a closed core, and three-body contributions through density-dependent two-body matrix elements (TBME) derived within a microscopic approach from chiral forces.

2018Sa40: calculated potential energy curves, $T_{1/2}$, Q(β^-), β^-n probability, Gamow-Teller strength distributions using constrained HF+BCS with Skyrme force SLy4.

2015Wa11: calculated potential energy surfaces, S(2p), excitation energies and B(E2), J^π, neutron and proton single-particle levels using relativistic mean−field + BCS method with PC−PK1 functional.

2014Co04: calculated energies and B(E2) values of first 2^+ state using realistic shell-model calculations with two different model spaces.

Theoretical calculations: consult the NSR database at for 16 primary references for nuclear structure, and two for decay modes and half-life.

2012Ca30: calculated energy levels, J^π, electric quadrupole and dipole magnetic moments using shell model with FPD6 and GXPF1 interactions.

2010Le20: calculated levels, J^π, B(E2), quadrupole moment, occupation of the neutron intruder orbitals and percentage of particle-hole excitations using interacting shell-model framework in full *pf* valence space based on ^{48}Ca core and effective interaction based on G matrix; discussed shell evolution and island of inversion around N=40.

2009Ga41: calculated single-particle energies, Nilsson diagrams, potential energy curves, neutron and proton pairing energy curves, excitation energies, spectroscopic quadrupole moments, and B(E2) using Hartree-Fock-Bogoliubov (HFB) approach with Gogny D1S effective interaction.

2008Gu03: calculated potential energy surfaces and ground state deformation using relativistic mean field theory.

Other theory references: 12 for structure and two for decay in the NSR database, also listed in this dataset as ‘document’ records.

Additional information 1.

Adopted Levels, Gammas (continued)

^{62}Ti Levels

Cross Reference (XREF) Flags

A $^{1}H(^{63}V,2p\gamma)$

E(level)†	J^{π}‡	XREF	Comments
0	0^+	A	$\%\beta^-$=100; $\%\beta^-$n=?; $\%\beta^-$2n=?; $\%\beta^-$3n=? Measured cross section=0.54 pb *11* using ^{9}Be target, as per e-mail reply of Nov 11, 2009 from O. Tarasov (first author of 2009Ta24 and 2009Ta05). E(level): fragment observed by 2009Ta24 is assumed to be in the ground state of ^{62}Ti. Theoretical $T_{1/2}(\beta)$=15.5 ms, $\%\beta^-$n=7.0, $\%\beta^-$2n=0.0, $\%\beta^-$3n=0.0 (2019Mo01). Theoretical $T_{1/2}(\beta)$=12.9 ms, $\%\beta^-$n=3.86, 4.0; $\%\beta^-$2n=0.146, 0.099; $\%\beta^-$3n=0.0 (2021Mi17, two values for a decay mode refer to different fission barriers). $T_{1/2}$: half-life of the ^{62}Ti activity has not been measured. It is expected to be greater than the time-of-flight through the beam transport system, which is 620-650 ns. From systematics of half-lives of neighboring Ti isotopes, the half-life is expected to be <15 ms (15 ms for ^{61}Ti, 22 ms for ^{60}Ti, 28 ms for ^{59}Ti and 58 ms for ^{58}Ti), assuming a decreasing trend of half-life as neutron number increases in neutron-rich nuclei. From systematic, $T_{1/2}$=9 ms in 2021Ko07.
683 *10*	(2^+)	A	
1506 *22*	(4^+)	A	

† From Eγ 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.

$\gamma(^{62}Ti)$

E_i(level)	J^{π}_i	E_γ	I_γ†	E_f	J^{π}_f
683	(2^+)	683 *10*	100	0	0^+
1506	(4^+)	823 *20*	100	683	(2^+)

† Based on cross section measurements in $^{1}H(^{63}V,2p)$.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level