Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	30-Apr-2022

Q(β^-)=1219×10[1] *17*; S(n)=156×10[1] *17*; S(p)=20790 *SY*; Q(α)=−14590 *SY* 2021Wa16

Estimated uncertainties (2021Wa16): 430 for S(p) and Q(α).

Q(β^-n)=7720 *160*, S(2n)=5410 *170*, S(2p)=40020 *720* (syst) (2021Wa16).

Q(β^-2n)=3980 *160* deduced by evaluator from relevant mass values in 2021Wa16.

1997Be70: ^{55}Ca identified in ^{9}Be(^{238}U,F), E=750 MeV/nucleon, fragments separator (FRS) at GSI facility, identification by time-of-flight. Measured production cross section.

2008Ma01: ^{55}Ca isotope produced in ^{9}Be(^{76}Ge,X) reaction at E=140 MeV/nucleon ^{76}Ge beam provided by NSCL at Michigan State University. Isotopes separated with A1900 fragment separator. Time-of-flight technique. Measured β particles using Beta Counting System of three Si PIN detectors, a double-sided silicon strip detector and six single sided silicon strip detectors. Detected γ rays using 16 Ge detectors of the Segmented Germanium array. Measured half-life of ^{55}Ca by fitting the decay curves to a function which included decay of the parent, growth and decay of daughter and a constant background. No gamma rays were seen in correlation with β rays.

Mass measurement: 2018Mi08.

Theoretical calculations: 28 primary references (27 for structure and one for ^{55}Ca decay) retrieved from the NSR database at www.nndc.bnl.gov/nsr/. These are listed in this dataset under 'document' records.

Additional information 1.

^{55}Ca Levels

Cross Reference (XREF) Flags

A ^{1}H(^{56}Ca,npγ)

E(level)	J$^{\pi}$[†]	T$_{1/2}$	XREF	Comments
0	(5/2$^-$)	22 ms *2*	A	%β^-=100; %β^-n=?; %β^-2n=? Theoretical T$_{1/2}$=19.1 ms, %β^-n=0, %β^-2n=0 (2019Mo01). Theoretical T$_{1/2}$=19.9 ms, %β^-n=2.06, 2.21; %β^-2n=0.16, 0.29 (2021Mi17). Theoretical %β^-n=4 (2008Ma01). T$_{1/2}$: from β timing measurement (2008Ma01, 52 β-correlated events out of a total of 256 implantations of ^{55}Ca). J$^{\pi}$: from shell-model predictions (2008Ma01). Others: 5/2$^-$ (syst, 2021Ko07), 1/2 (theory, 2019Mo01). Production cross section=2 nb (1997Be70) corresponding to six counts assigned to ^{55}Ca in ^{9}Be(^{76}Ge,X) reaction.
673 *17*	(1/2$^-$)	0.78 ns *+36−23*	A	E(level): from Eγ. T$_{1/2}$: mean lifetime τ=1130 ps *+520−330*, estimated from peak-shape analysis in ^{1}H(^{56}Ca,npγ) (2022Ko06).

[†] from theoretical calculations (2022Ko06) using different models: large-scale shell model (LSSM), ab-initio valence-space in-medium similarity renormalization group (VS-IMSRG), and full-space self-consistent Green's function (SCGF NNLO$_{sat}$ and SCGF NN+3N(lnl)).

Adopted Levels, Gammas (continued)

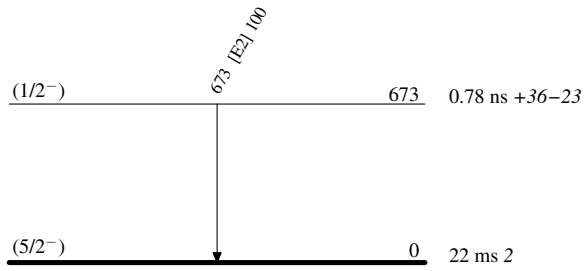
$\gamma(^{55}Ca)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
673	(1/2$^-$)	673 *17*	100	0	(5/2$^-$)	[E2]	B(E2)(W.u.)=0.42 *+18−13*

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{55}_{20}Ca_{35}$