Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, John Cameron and Balraj Singh	NDS 113,1 (2012)	31-Dec-2011

Q(β^-)=−2.18×10^4 *syst*; S(n)=1.931×10^4 *syst*; S(p)=2.57×10^3 *4*; Q(α)=−6.68×10^3 *4* 2012Wa38
Note: Current evaluation has used the following Q record 19310 syst 2567 40 −6676 *40* 2011AuZZ.
Estimated ΔS(n)=200 (2011AuZZ).
Q(εp)=9307 *40*, S(2n)=36445 *301* (syst), S(2p)=2652 *40* (2011AuZZ).
Values in 2003Au03: S(n)=19110 *200* (syst), S(p)=2560 *40*, Q(α)=−6660 *40*, S(2n)=35740 *300* (syst), S(2p)=2640 *40*, Q(εp)=9320 *40*.
1977Tr03: First report on ^{36}Ca nuclide from mass excess in reaction: ^{40}Ca(^{4}He,^{8}He), deduced mass excess.
1981Ay01: First identification of this nuclide in reaction: ^{40}Ca(^{3}He,α3n) at 95 MeV. Measured delayed proton decay and isotopic half-life; Berkeley cyclotron facility and recoil-atom mass analyzer.
1995Ga16: ^{36}Ca produced using a radioactive ion beam from ISOLDE online isotope separator with a Ti target at CERN, measured delayed proton decay of ^{36}Ca.
1997Tr05, 1995Tr02: ^{36}Ca produced by fragmentation of ^{40}Ca beam with a ^{9}Be target at 300 MeV/nucleon beam energy, fragments separated using FRS facility at GSI. Measured delayed proton branches and isotopic half-life.
2001Lo11: ^{36}Ca produced by fragmentation of ^{40}Ca beam at 95 MeV/ nucleon with Ni target, fragments separated with LISE3 spectrometer at GANIL facility. Measured delayed proton branches.
2007Do11, 2007Bu15: ^{9}Be(^{37}Ca,Xγ) one-neutron knockout reaction (GSA and GANIL), identification of first 2$^+$ state.
^{36}Sc nuclide which can possibly decay by β to ^{36}Ca is not yet identified.
^{37}Sc nuclide which can possibly decay by protons to ^{36}Ca is not yet identified.
^{37}Ti nuclide which can possibly decay by β-delayed protons to ^{36}Ca is not yet identified.
^{38}Ti nuclide which will most likely decay by two-proton emission to ^{36}Ca is not yet identified but its search and upper limit of 120 ns for half-life has been reported by 1996Bl21.
Additional information 1.

^{36}Ca Levels

Cross Reference (XREF) Flags

A ^{9}Be(^{37}Ca,Xγ)
B C(^{38}Ca,2nγ),H(^{38}Ca,2nγ)
C ^{40}Ca(^{4}He,^{8}He)

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0	0$^+$	101.2 ms *20*	ABC	%ε+%β^+=100; %εp=51.2 *10* (2007Do11) %εp: from 2007Do11. Others: 54.3% *15* (2001Lo11) is an earlier measurement from GANIL, same lab as 2007Do17, 57% *5* (or 14) (1997Tr05,1995Tr02), ≈20 (1981Ay01). T$_{1/2}$: from timing of β(proton) correlated events. Weighted average of 100.1 ms *23* (2007Do17) and 102 ms *2* (1995Tr02,1997Tr05). Other: 100 ms *+90−40* (1981Ay01).
3045.0 *24*	(2$^+$)		AB	J$^\pi$: from systematics and shell model calculations. E(level): from mirror energy difference ΔE$_M$=E(^{36}Ca)−E(^{36}S)=−246 3 for the first excited 2$^+$ states in ^{36}Ca and ^{36}S. The energy of the 2$^+$ excited state in ^{36}S is at 3291 keV from Adopted Levels. 2007Do11 interpret this large ΔE$_M$ value in terms of detailed shell-model calculations using ^{16}O core, the *sd* shell isospin symmetric interaction, and experimental single particle energies from ^{17}O and ^{17}F.

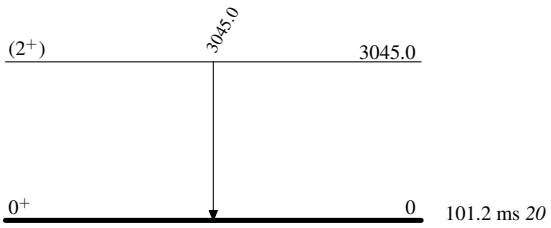
Adopted Levels, Gammas (continued)

γ(^{36}Ca)

E_i(level)	J_i^π	E_γ	E_f	J_f^π	Comments
3045.0	(2$^+$)	3045.0 *24*	0	0$^+$	E_γ: from C,H(^{38}Ca,2nγ) (2009AmZZ). Others: 3015 *16* (2007Do11), 3036 *11* (2007Bu15) given in ^{9}Be(^{37}Ca,Xγ) dataset.

Adopted Levels, Gammas

Level Scheme



$^{36}_{20}Ca_{16}$