

Adopted Levels, Gammas

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Balraj Singh	ENSDF	21-May-2021

$Q(\beta^-)=15760$ SY; $S(n)=2960$ SY; $S(p)=22960$ SY; $Q(\alpha)=-16190$ SY [2021Wa16](#)

Estimated uncertainties ([2021Wa16](#)): $\Delta Q(\beta^-)=600$, $\Delta S(n)=720$, $\Delta S(p)=920$; $\Delta Q(\alpha)=780$.

$Q(\beta^-n)=13070$ 600, $S(2n)=4290$ 780 (syst,[2021Wa16](#)). $S(2p)=42630$ (theory,[2019Mo01](#)).

$Q(\beta^-2n)=8210$ 600 and $Q(\beta^-3n)=4020$ 600 deduced by evaluator from relevant mass values in [2021Wa16](#).

[2009Ta24](#), [2009Ta05](#): ^{52}Ar produced in fragmentation of ^{76}Ge beam at 132 MeV/nucleon on ^9Be targets, with 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 momentum and particle identification. The nuclei of interest were stopped in eight Si diodes 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, the magnetic rigidity, total kinetic energy and the time-of-flight (TOF) provided unambiguous identification of the atomic number, charge state and mass number. Measured cross section= 0.028 pb +35-14 using ^9Be target (e-mail reply of Nov 11, 2009 from O. Tarasov to B. Singh, first author of [2009Ta24](#)).

 ^{52}Ar LevelsCross Reference (XREF) Flags

A $^1\text{H}(^{53}\text{K}, 2p\gamma)$

E(level) [†]	J ^π	XREF	Comments
0	0 ⁺	A	$\% \beta^- = 100$; $\% \beta^- n = ?$; $\% \beta^- 2n = ?$; $\% \beta^- 3n = ?$ β^- is the only possible decay mode, followed by β^- -delayed neutron emissions. Theoretical $T_{1/2}=15.9$ ms, $\% \beta^- n=40$, $\% \beta^- 2n=1$, $\% \beta^- 3n=0$ (2019Mo01). Theoretical $T_{1/2}=15.1$ ms, $\% \beta^- n=72.4$, $\% \beta^- 2n=1.4$, $\% \beta^- 3n=0.5$ (2016Ma12). $T_{1/2}$: half-life of ^{52}Ar has not yet been measured. From time-of-flight of 620-650 ns (e-mail reply of Sept 23, 2009 from O. Tarasov to B. Singh), $T_{1/2}>650$ ns. From a general decreasing trend of half-lives with increasing neutron number, $T_{1/2}$ for ^{52}Cl is expected to be <50 ms, based on measured half-lives of 1.23 s for ^{47}Ar , 475 ms for ^{48}Ar , 170 ms for ^{49}Ar , and 106 ms for ^{50}Ar , available in literature. Other: 40 ms (2021Ko07 ,systematics).
1656 18	(2 ⁺) [‡]	A	
2295 39	(2 ⁺) [‡]	A	

[†] From E_γ values.

[‡] From systematics of even-even nuclei, and comparison of measured level energies and cross sections with theoretical calculations.

 $\gamma(^{52}\text{Ar})$

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π
1656	(2 ⁺)	1656 18	100	0	0 ⁺
2295	(2 ⁺)	2295 39	100	0	0 ⁺

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Level Scheme

Intensities: Relative photon branching from each level

