^{34}Na β^-n decay (5.0 ms)   1984La03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 199,1 (2025)	30-Sep-2024

Parent: ^{34}Na: E=0; T$_{1/2}$=5.0 ms *9*; Q(β^-n)=18.65×10^3 *60*; %β^-n decay=65 *35*

^{34}Na-J$^\pi$: 1$^+$ is assigned in 2021Ko07, but no supporting arguments for this firm assignment seem available in the literature.

^{34}Na-T$_{1/2}$: Weighted average of 5.5 ms *10* (1984La03, β^-n decay); 4.6 ms *9* (1981ThZV).

^{34}Na-Q(β^-n): From 2021Wa16.

^{34}Na-%β^-n decay: %β^-n=65 *35* for the decay of ^{34}Na, estimated by evaluators from systematics of %β^-n, T$_{1/2}$ and Q(β^-n) values for ^{27,28,29,30,31,32,33}Na, and following an approach of 2014Mc07 for such systematics. Using measured value of %β^-n+2×%β^-2n=115 *20* by 1984La03, the evaluators estimate %β^-2n=35 *20*. Almost 100% delayed neutron decay mode of ^{34}Na was indicated by non-observation of any γ rays from A=34 isobars, and in particular from the decay of ^{34}Na, as stated by 1981GuZM. Note that the values of %β^-n≈15, and %β^-2n≈50 suggested by 2021Ko07, based on systematic trend of ratio of %β^-n/%β^-2n in neighboring nuclei, seem erroneous.

1984La03: Na isotopes were produced by bombarding a 30 g/cm^2 Ir target with 10 GeV proton beam from the CERN synchrotron. Fragments were separated and collected into a thin stainless steel tube. β particles were detected with two plastic scintillators and neutrons were detected with a 4π liquid scintillator detector. Measured I(n), βn(t). Deduced parent T$_{1/2}$, β-delayed neutron emission probabilities.

^{33}Mg Levels

E(level)	J$^\pi$	T$_{1/2}$	Comments
0	3/2$^-$	90.3 ms *10*	J$^\pi$,T$_{1/2}$: from the Adopted Levels.