## $^{27}S$ $\varepsilon$2p decay (15.9 ms)    1991Bo32,2017Ja05

### History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | M. Shamsuzzoha Basunia, Anagha Chakraborty | NDS 205,1 (2025) | 31-May-2025 |

Parent: $^{27}S$: E=0.0; $J^\pi$=(5/2$^+$); $T_{1/2}$=15.9 ms $15$; Q($\varepsilon$2p)=11300 $syst$; %$\varepsilon$2p decay=2.7 $6$

$^{27}S$-$T_{1/2}$: weighted average of 15.5 ms $15$ (2001Ca60), 15.5 ms $16$ (2017Ja05), 21 ms $4$ (1991Bo32), 16.3 ms $27$ (2021Sh23 − also 17 ms $4$).

$^{27}S$-Q($\varepsilon$2p): deduced using data from AME2020 (2021Wa16).

$^{27}S$-%$\varepsilon$2p decay: weighted average of %$\varepsilon$2p=2.4 $5$ (2021Sh23), 3.0 $6$ (2017Ja05), 2.0 $10$ (1991Bo32), and 1.1 $5$ (2001Ca60). Other: 1.1 $5$ (2011Ba29) in the ENSDF database.

1991Bo32: Produced by Ni($^{36}Ar$,x), E($^{36}Ar$)=85 MeV/A. Magnetic mass separation, Energy loss, tof, Si E$\Delta$E detector telescope.

2017Ja05: $^{27}S$ obtained from $^{32}S$ fragmentation from Be($^{32}S$,X), E=51.3 MeV/nucleon, reaction; isotopes were separated using the ACCULINNA fragment separator at JINR, Dubna, Russia facility. Fragments were identified by time-of-flight (tof) and energy-loss technique using plastic scintillator and a silicon detector, respectively. Selected fragments were analyzed by Optical Time Projection Chamber (OTPC), filled with 49.5% Ar, 49.5% He, and 1% $CO_2$ at atmospheric pressure. Light produced in the gas was recorded by a digital camera (CCD) and a photomultiplier (PMT) connected to an oscilloscope; the combination of data from the CCD and the PMT was used to reconstruct particle tracks in three dimensions.

2021Sh23: $^{27}S$ obtained from $^{32}S$ fragmentation in Be($^{32}S$,X), E=80.6 MeV/nucleon reaction. Fragments were separated using the RIBLL1 and identified by time-of-flight (tof) and energy-loss. Fragments implanted into three W1-type DSSDs each segmented into 16 x 16 strips. Gamma rays were measured with five Clover type HPGe detectors. Measured Ep, Ip, p(t), deduced proton branching ratios.

### $^{25}Al$ Levels

| E(level) | $J^{\pi\dagger}$ | $T_{1/2}$ |
|---|---|---|
| 0 | 5/2$^+$ | 7.168 s $4$ |

$^\dagger$ from Adopted Levels.

### Delayed Protons ($^{25}Al$)

| E(p) | E($^{25}Al$) | E($^{27}P$) | Comments |
|---|---|---|---|
| 6410 $45$ | 0 | 12752 | E(p): from 1991Bo32. |

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Decay Scheme

$(5/2^+)$    0.0    15.9 ms *15*

%$\varepsilon$2p=2.7    $Q_{\varepsilon 2p}$=11300 *syst*

$^{27}_{16}\text{S}_{11}$

12752

| E(p) | I(p) | E($^{27}_{15}$P) | E($^{25}_{13}$Al) |
|------|------|------|------|
| 6410 |      | 12752 | 0 |

$^{27}_{15}\text{P}_{12}$

5/2$^+$        0

$^{25}_{13}\text{Al}_{12}$