^{9}Be(^{26}Ne,^{24}F) 2011Fr13

History

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

Adapted/Edited the XUNDL dataset compiled by M. Birch and B. Singh (McMaster); September 30, 2011.

Proton-removal reaction followed by a neutron emission from ^{25}F.

Secondary ^{26}Ne beam, E=86 MeV/nucleon, produced from a ^{40}Ar primary beam, E=140 MeV/nucleon, at the National Superconducting Cyclotron Laboratory of MSU. Target=721 mg/cm^2 thick beryllium target. ^{24}F fragments deflected by the large-gap Sweeper Magnet were recorded by charged-particle detectors. Neutrons were detected in coincidence by the Modular Neutron Array (MoNA). Measured decay energy spectra. Deduced resonances, levels.

Data for ^{24}F+n coincidences can be described with three resonances, however no detailed fits were performed for the higher−lying resonances for the possibility of the presence of several levels that cannot be resolved with the set-up resolution (2011Fr13).

^{25}F Levels

Only the unbound neutron state observed in the present study is shown.

Decay energy spectra were calculated from the difference of the invariant mass of ^{25}F and the sum masses of the neutron and ^{24}F. The mass excess values of ^{24}F and ^{25}F used were 7560 keV *72* and 11410 keV *90*, respectively.

E(level)[†]	Jπ	Γ	L	Comments
4.31×10^3 *14*	1/2$^-$	<20 keV		E_r=28 *4* (2011Fr13). E(level): other: 4249 keV *116* in 2011Fr13, deduced from measured E_{res}= 28 keV *4* and measured S(n)=4221 keV *115* (2007Ju03). Assignment assumes the resonance decays to the ground state of ^{24}F. Jπ: assignment based on comparison with shell model calculations. Γ: based on experimental resolution, authors report an upper limit for the width.
4.63×10^3?[‡] *14*		≈200 keV	1	E_r=350? (2011Fr13).
5.48×10^3?[‡] *14*		≈800 keV	1	E_r=1200 (2011Fr13).

[†] From E_r and Sn(^{25}F)=4280 keV *140* in AME2020 (2021Wa16). E_r listed in the comments.

[‡] Authors stated that the resolution of the experimental setup did not allow for a detailed comparison of this resonance. Sn(^{25}F)=4280 keV *140* in AME2020 (2021Wa16).