$^{18}O(^{18}O,^{19}N)$ 1977De14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. C. Sheu, J. H. Kelley	ENSDF	06-Nov-2018

1977De14: An E(^{18}O)=91 MeV beam, produced by the Orsay MP tandem, impinged on a self-supported 100 μg/cm^2 thick Ai_2O_3 (90% enriched) target. The emitted nuclei were analyzed by a double-focusing 180° magnetic spectrograph at θ=10° with $\Delta\Omega$=1 msr and were detected using two resistive-wire counters and a set of four Si position-sensitive detectors. The fragments were identified based on ΔE-E information and their masses were deduced from the measured Q(β^-)values. The mass excess of ^{19}N ΔM=15.81 MeV *9* deduced in this experiment is located nearly halfway between the two conflicting predictions of the Garvey-Kelson formula and the modified shell-model mass equation. The cross section σ(lab)=0.8 μb/sr was also deduced.

1982Na08: A beam of ^{18}O from the Orsay MP-Tandem impinged on a self-supported 72 μg/cm^2 thick Al_2O_3 target (90% enriched). The emitted nuclei were analyzed by a 180° magnetic spectrometer at θ=4°−8° and $\Delta\Omega$=4.8 msr. The fragments were detected using two resistive-wire proportional counters and an ionization chamber and were identified by ΔE-E method with 2% and 1.5% resolution for ^{19}N and ^{21}O respectively.

The mass excess of ^{19}N ΔM=15.856 MeV *50* and three levels of ^{19}N*(0, 1.12, 1.59 MeV) were measured with proposed J^π=1/2$^-$, 3/2$^-$ and 5/2$^-$ respectively according to the shell-model prediction and comparison to the ^{17}N level scheme. The cross section of $^{19}N_{g.s.}$ was also measured as $\sigma\approx0.5\mu$b/sr.

1989Ca25: Excitation energies for low-lying ^{19}N states (T=5/2) were derived from two reactions A: $^{18}O(^{18}O,^{17}F)^{19}N$ and B: $^{18}O(^{18}O,^{19}N)$. Beams of ^{18}O ions at E=117 MeV(α), 119 MeV(β) from the 14μs Pelletron accelerator at Australian National University bombarded a 195 μg/cm^2 thick enriched SiO_2 target (70 μg/cm^2 ^{18}O content). The ejectiles were detected using an Enge split-pole spectrometer at θ_{mean}=10°(α) ($\Delta\Omega$=3.4 msr and acceptance angle of 4.5°) and θ_{mean}=4.5°(β) ($\Delta\Omega$=1.5 msr and acceptance angle of 2.0°). In the coincidence measurements, recoil nuclei were detected using a silicon surface barrier detector mounted 150 mm from the target and at the θ_{lab}=−42.0°. The other ejectile was measured in the focal plane and was identified using ΔE-E-B_ρ techniques.

The mass excess of ^{19}N was deduced as ΔM=15.819 MeV *35* which is in agreement with the value measured in (1983Ho08). Excitation levels of ^{19}N*(1.68 *4*,2.57 *5*,3.54 *5*,4.22 *4* MeV) and ^{19}N*(1.11 *2*,1.65 *2*,2.53 *3*,3.45 *3*,4.16 *3* MeV) were measured by reaction A and B, respectively.

See also (1976DeZH,1980Na12,1981NaZQ).

^{19}N Levels

E(level)†	J^π‡	Comments
0	1/2$^-$	ΔM=15.819 MeV *35* (1989Ca25).
1110 *20*	3/2$^-$	
1650 *20*	5/2$^-$	
2540 *30*		
3470 *30*	7/2$^-$	
4180 *20*	9/2$^-$	

† From average of values in (1989Ca25).
‡ From shell model calculations.