

Abstract Submitted
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^{19}F alpha widths from $^{15}\text{N}(\alpha, \alpha)^{15}\text{N}$ data and the $^{18}\text{F}+p$ reaction rates¹ DAN BARDAYAN, ORNL, RAY KOZUB, Tenn. Tech. Univ., MICHAEL SMITH, ORNL — The rates of the $^{18}\text{F}(p, \alpha)^{15}\text{O}$ and $^{18}\text{F}(p, \gamma)^{19}\text{Ne}$ reactions are important for understanding production of the long-lived radioisotope ^{18}F in novae and the transition to heavy-element production in X-ray bursts. A knowledge of the alpha widths of numerous ^{19}Ne levels is critical for calculating these rates. These widths are generally not known and must be extrapolated from information on the isospin mirror nucleus ^{19}F . Much of this information comes from a measurement of the $^{15}\text{N}(\alpha, \alpha)^{15}\text{N}$ reaction [1], and we have reanalyzed this data using a multilevel R -matrix approach to determine properties of resonances in the astrophysically-important range $E_x = 6.4 - 7.5$ MeV. We find the energies and widths of broad levels to be different than previously reported. We have also set upper limits on the widths of postulated $3/2^+$ resonances, analogs of which are important for the $^{18}\text{F}+p$ reaction rates. The method and results will be presented.

[1] H. Smotrlich *et al.*, Phys. Rev. **122**, 232 (1961).

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