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Extracting ANCs in neutron transfer reactions to determine proton capture reaction rates TARIQ AL-ALBDULLAH, X. CHEN, C.A. GAGLIARDI, Y.-W. LUI, G. TABACARU, Y. TOKIMOTO, L. TRACHE, R.E. TRIBBLE, Texas A&M University, F. CARSTOIU, Institute of Physics and Nuclear Engineering, Romania — The high temperatures ($>10^8$ K) in novae outbursts enable unstable nuclei to leak out from the hot CNO cycle to the rp-process, where heavier nuclei such as ^{18}F and ^{22}Na are synthesized and might be ejected. Their abundances can be influenced by the $^{17}\text{F}(p,\gamma)^{18}\text{Ne}$ and $^{22}\text{Mg}(p,\gamma)^{23}\text{Al}$ reactions respectively. The first reaction connects the CNO and NeNa cycles, while the second may explain the unobserved γ -ray emission from ^{22}Ne due to the β decay in ^{22}Na . We have applied an indirect technique to determine the above reaction rates at stellar energies. We have measured the neutron transfer reactions $^{13}\text{C}(^{17}\text{O},^{18}\text{O})^{12}\text{C}$ and $^{13}\text{C}(^{22}\text{Ne},^{23}\text{Ne})^{12}\text{C}$ to determine the asymptotic normalization coefficients (ANCs) for the ground and first excited states in ^{18}O and ^{23}Ne . These ANCs can be transposed to the corresponding states in the mirror nuclei ^{18}Ne and ^{23}Al respectively. As a part of these experiments, we have measured the elastic scattering data to obtain the optical model parameters that are used in DWBA calculations, and hence to extract the ANCs.

- Prefer Oral Session
 Prefer Poster Session

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