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The direct 18O(p; °)19F capture and the ANC method.
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The depletion of 18O via the (p; °) capture is competing with the (p; ®) capture during the CNO cycles in AGB stars. Despite the fact that the (p; ®) capture is dominant the (p; °) can play an important role in mixing stages of star evolution. Here, we attempted to determine the astrophysical S-factor of the direct part of the 18O(p; °)19F capture by the indirect method of asymptotic normalization coe±cients (ANC). We measured the di®erential cross section of the transfer reaction 18O(3He; d)19F at a 3He energy of 24.6 MeV. The measurement was realized on the NPI cyclotron in ·Re·z, Czech Republic, with the gas target consisting of the high purity 18O (99.9 %). The reaction products were measured by eight ¢E-E telescopes composed from thin and thick silicon surface-barrier detectors. The parameters of the optical model for the input channel were deduced by means of the code ECIS and the analysis of transfer reactions to 12 levels of the 19F nucleus up to 8.014 MeV was made by the code FRESCO. The deduced ANCs were then used to specify the direct contribution to the 18O(p; °)19F capture process and compared with two experimental works.

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