

Indirect study of $^{13}\text{C}(\alpha,n)^{16}\text{O}$ reaction through $^{13}\text{C}(^7\text{Li,t})^{17}\text{O}$ transfer reaction

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The reaction $^{13}\text{C}(\alpha,n)^{16}\text{O}$ is considered as the main neutron source for s-process in low-mass asymptotic giant branch stars [?]. At low energies of astrophysical interest (190 keV corresponding to temperature of 10^8 K), the contribution of the subthreshold state 6.356 MeV of ^{17}O to the $^{13}\text{C}(\alpha,n)^{16}\text{O}$ cross section should be taken into account. However, the results of previous studies [?, ?, ?] of this contribution lead to different conclusions.

Hence, to further investigate the effect of this resonance, we performed a new precise measurement of the alpha spectroscopic factor, S_α , of the 6.356 MeV state using the transfer reaction $^{13}\text{C}(^7\text{Li,t})^{17}\text{O}$ at two different incident energies. A brief description of the experiment and the analysis procedure will be given. The measured angular distributions and the obtained spectroscopic factors will be presented as well as their impact on $^{13}\text{C}(\alpha,n)^{16}\text{O}$ reaction rate.

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