

One-neutron stripping processes to excited states of the ${}^6\text{Li} + {}^{94,96}\text{Zr}$ reaction at near-barrier energies

Wednesday, 19 August 2020 15:45 (15 minutes)

Direct transfer of neutrons involving stable and radioactive weakly bound projectiles have been investigated in the past few years to contribute to the reaction and scattering mechanisms. At the energy around the Coulomb barrier, the neutron transfer reaction may cause the fission reaction and the enhancement of fusion cross sections to some systems, and the influence of neutron transfer on the fusion reaction can not be ignored. In this study, we adopted online gamma ray method to measure the 1n stripping to respectively product ${}^{95,97}\text{Zr}$ of ${}^6\text{Li} + {}^{94,96}\text{Zr}$ around the Coulomb barrier. The experiment was performed at the HI-13 Tandem Accelerator of the China Institute of Atomic Energy (CIAE) in Beijing. It is found that the cross sections of 1n stripping of ${}^6\text{Li} + {}^{96}\text{Zr}$ are smaller than that of complete fusion reaction at energies above the Coulomb barrier, however, at energies around the Coulomb barrier the cross sections of 1n stripping have the same magnitude with that of complete fusion. The transfer process gives a important contribution at energies around the Coulomb barrier. In ${}^6\text{Li} + {}^{94}\text{Zr}$, the preliminary results have been obtained. The correction of Gamma ray angular distribution and the determination of energy levels will be considered on basis of the current results. A systematic behavior of 1n stripping on Zr targets can be explored.

Field of your work

Experiential nuclear physics

Primary authors: Mr YANG, Tao (Beihang University); Prof. ZHANG, Gao Long (Beihang University); Dr HU, Shi Peng (Shenzhen University)

Presenter: Mr YANG, Tao (Beihang University)

Session Classification: Young Scientist Session 3