The studies of nuclear structure and nuclear astrophysics via single nucleon transfer reaction

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Single nucleon transfer reactions provide the information on spectroscopic properties of nuclear states in the final nucleus. The measurement of the angular distribution for the transfer reactions is considered as a useful tool for producing the nuclei beyond the driplines to investigate the single-particle properties of exotic nuclei and the evolution of shell structure with neutron excess. The density distribution of valence nucleon can also been extracted from the angular distribution of transfer reaction, that have been used in the study of halo nuclei\(^{[1,2]}\). The total cross section for the radiative capture reaction is determined by the initial scattering wave function in the entrance channel, the single particle radial wave function of the bound state and the spectroscopic factor, which can be extracted from the one nucleon transfer reactions. The nucleon transfer reaction can then be used as a indirect method to deduce the \((p, \gamma)\) and \((n, \gamma)\) reactions for the astrophysical interests\(^{[3-6]}\). Some of above mentioned results in resent years will be presented in this symposium.

References