2 - 24 Experimental Data of High Energy Proton Induced Neutron Production Double Differential Cross Sections

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Studies on the spallation reaction have recently been made for various applications, such as Accelerator Driven System (ADS)[1-3] for transmutation of nuclear waste, energy production, condensed matter physics, neutron sources for material irradiation, neutron scattering science, industrial applications.

China has started to design ADS project with according to the situation of China sustainable development of nuclear energy. For the design of these facilities, evaluated nuclear data in the energy region up to a few GeV are required. And compilation of evaluated nuclear data files related to ADS has been proposed. This work is very complicated and need many steps to complete it. In this report, we'll discuss the collection of the experimental data which is the first and most important step of the evaluation work.

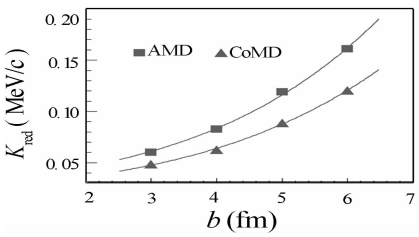

Fig. 1 800 MeV p+Pb experimental data comparison of different groups.

Several groups[4-13] have measured the double-differential (p, xn) production cross sections for various target materials and incident proton kinetic energy between 113 MeV and 3 GeV. These experimental measurements were motivated by the goal of improving different simulation codes and validating spallation reaction models. We collected all the available experimental data and analysis the difference between them.

The measurements have been made by different groups have shown good agreement, as shown in Fig. 1. In this figure, the experimental data at 60°, 120°, 150° was normalized to the factor 0.1, 0.01, 0.001.

In the future work, we'll analysis the experimental set-up, experimental method, detection efficiency and errors on experimental data in more detail. The much more accuracyevaluated experimental data on the whole energy region will be obtained.

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