

Experimental Activities in China

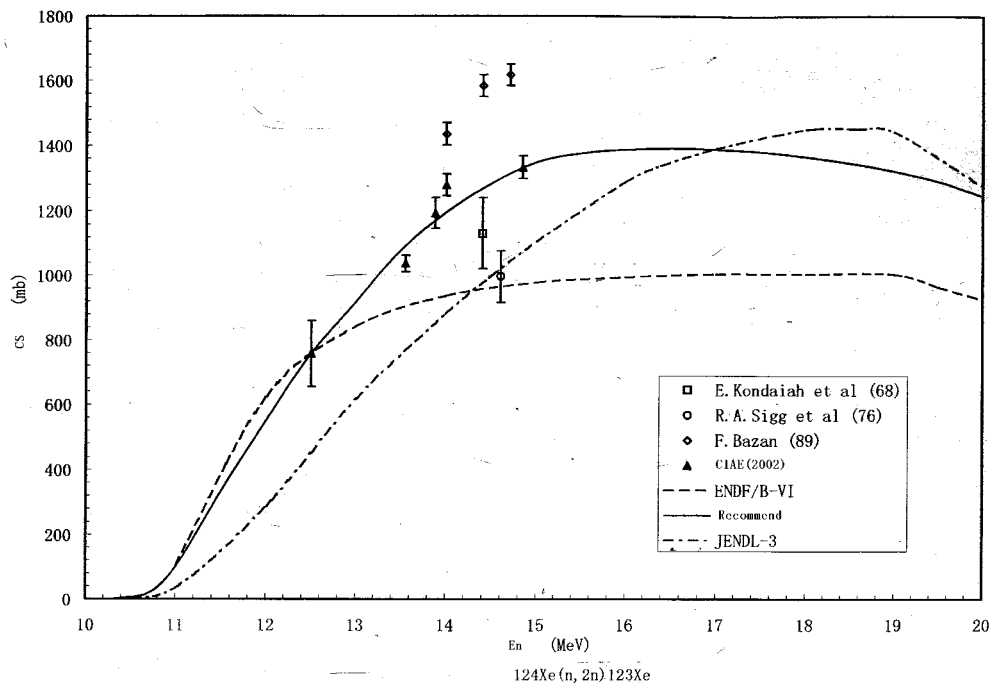
(May 2003)

Yu Hongwei

(China Nuclear Data Center)

The following nuclear data measurement laboratories are included in china Nuclear Data Network: China Institute of Atomic Energy, Peking University, Sichuan University, Lan zhou University and etc. The summarized activities are covered during the period of last one year.

- (1) The cross sections for the $^{124}\text{Xe}(n, 2n)^{123}\text{Xe}$ reaction were measured at 12.50MeV, 13.55MeV, 13.88MeV, 14.00MeV and 14.48MeV by using the activation method at CIAE.



- (2) The cross sections of $^{209}\text{Bi}(n,3n)^{207}\text{Bi}$, $^{191}\text{Ir}(n,3n)^{189}\text{Ir}$, $^{151}\text{Eu}(n,3n)^{149}\text{Eu}$, $^{185}\text{Re}(n,3n)^{183}\text{Re}$ reactions was measured at neutron

energy of $14.7 \pm 0.2 \text{ MeV}$ at Lanzhou University. The activities were measured with high resolution HPGe detector. The error of the measured cross section is 9.4%.

- (3) The neutron capture cross sections for the $^{71}\text{Ga}(n,\gamma)^{71}\text{Ga}$ reaction were measured at 0.31 MeV, 0.51 MeV, 1.05 MeV and 1.58 MeV by using the activation method. The Experiments were carried out at the 4.5 MV Van de Graaff accelerator at Peking University.
- (4) The neutron capture cross sections for the $^{141}\text{Pr}(n,\gamma)^{142}\text{Pr}$ reaction relatively to the $^{197}\text{Au}(n,\gamma)^{198}\text{Au}$ reaction were measured at 0.539 MeV, 1.090 MeV and 1.587 MeV by using the activation method at Peking University. The activities were measured with a high resolution HPGe detector gamma-ray spectrometer. The errors of the measurements are 6%~7%.
- (5) The differential cross sections and integrated cross sections of the $^6\text{Li}(n,t)^4\text{He}$ reaction were measured at 1.85 and 2.67 MeV by using a gridded ionization chamber at Peking University. Neutrons were produced through the $\text{T}(p,n)^3\text{He}$ reaction
- (6) The inelastic-scattering neutron DDX of ^9Be for 5.9 and 6.4 MeV neutron were measured at Peking University. The result shows that : the 1st excited state (1.68 MeV) of ^9Be exists and inelastic-scattering from this Level can not be neglected ; Except for the notable inelastic-scattering from 2.43 MeV Level, although those from $1/2^-$

and $5/2^+$ level (2.8 and 3.06MeV) are not complete separated each other, taking accounts of level width of these levels, but those from $1/2^-$ and $5/2^+$ level still exist.

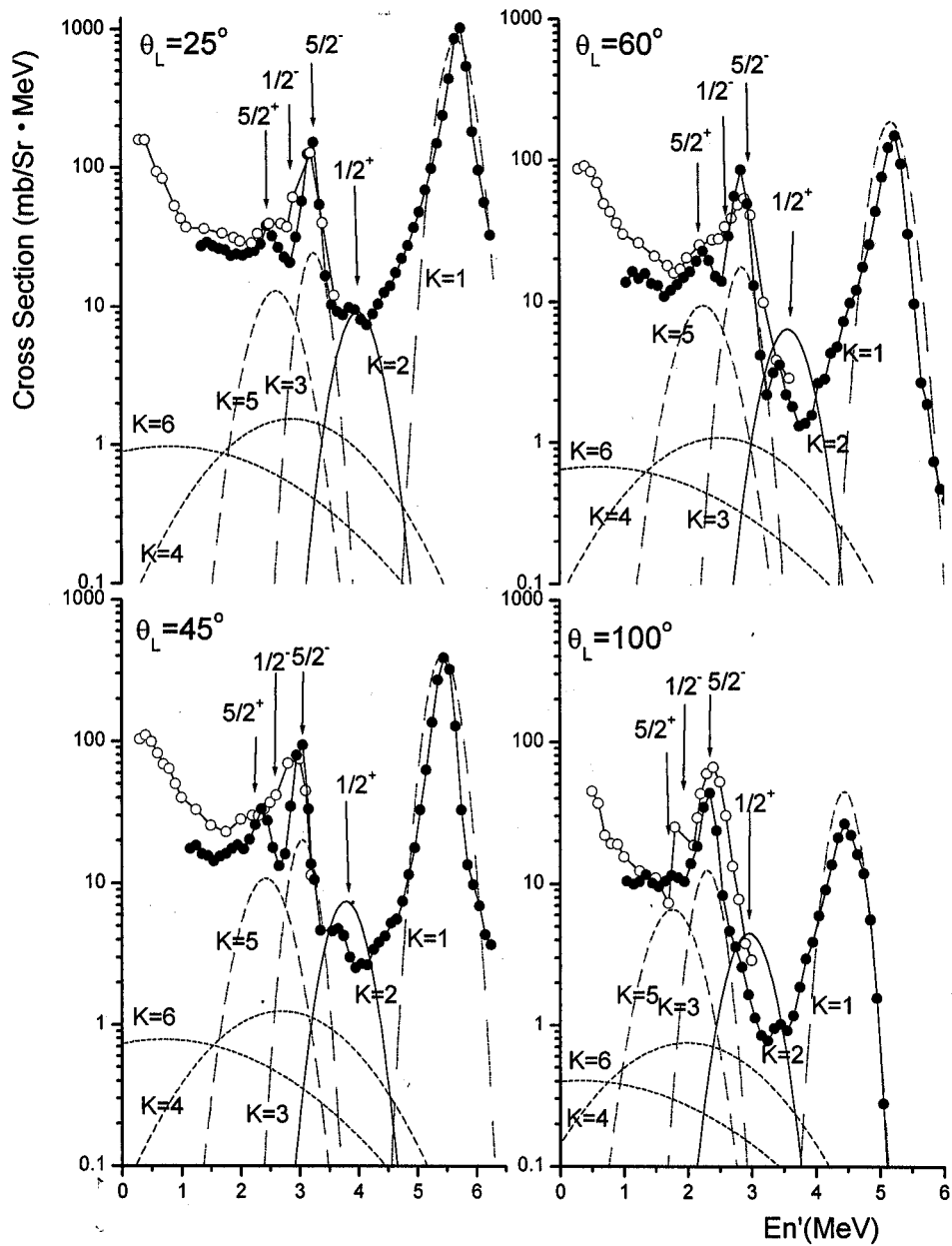


Fig.1 Double-Differential Cross Sections of ${}^9\text{Be}$ at 5.9 MeV
 ● Present ○ LANL ----- Calculation

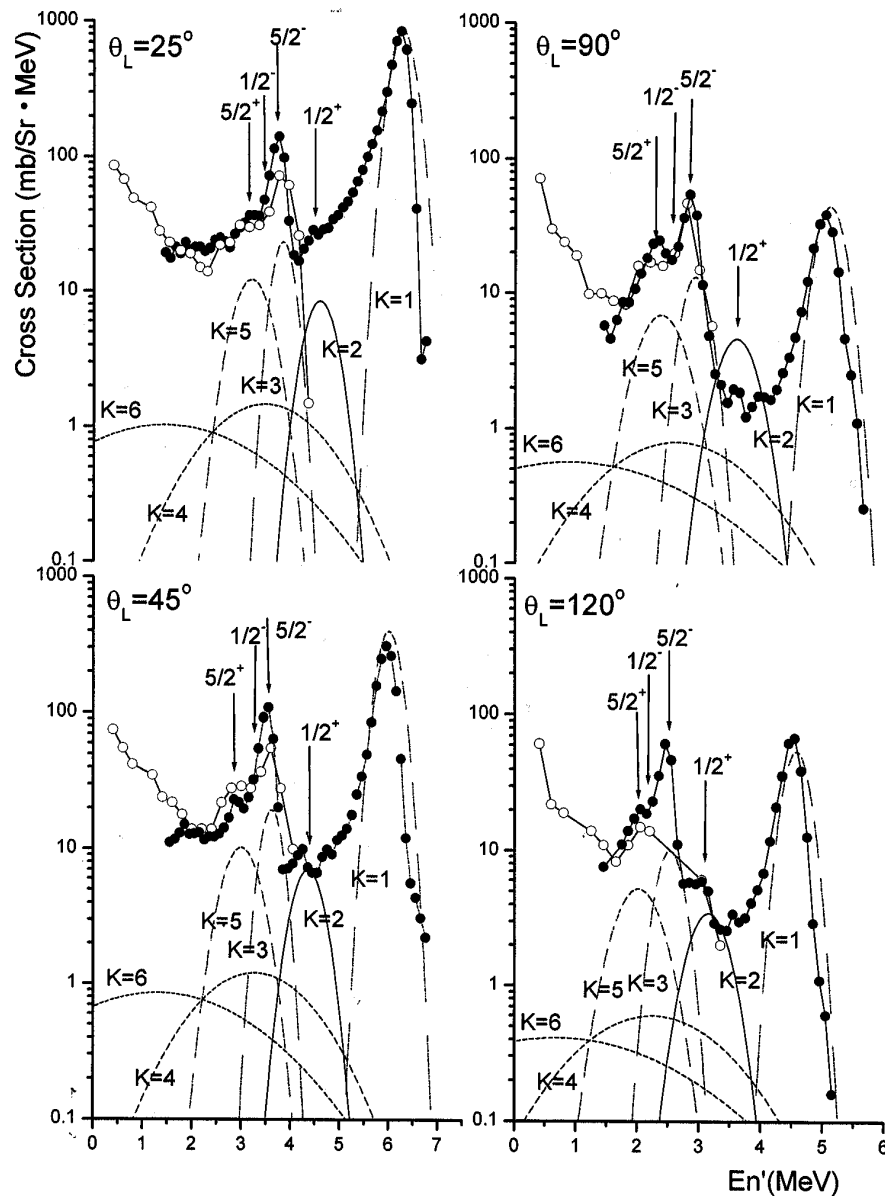


Fig.2 Double-Differential Cross Sections of ^9Be at 6.4 MeV

● Present ○ Tohoku ----- Calculation

- (7) The cross section for the $^{50}\text{Cr}(n, \gamma)^{51}\text{Cr}$ reaction was measured relatively to that of ^{197}Au for neutron energy from 50 to 1052 keV, using the activation technique. Neutrons were generated via the $^7\text{Li}(p, n)^7\text{Be}$ and $\text{T}(p, n)^3\text{He}$ reactions with a 2.5MV Van de Graaff

accelerator at Sichuan University. The activities after irradiation were measured with a calibrated high resolution HPGe detector.

Table1. Measured cross sections(mb)

$E_n(\text{keV})$	(mb)
50 ± 13	19.1 ± 1.0
145 ± 23	13.3 ± 0.7
270 ± 24	9.0 ± 0.5
437 ± 89	6.9 ± 0.4
750 ± 89	5.6 ± 0.4
1052 ± 93	3.4 ± 0.2