

The Angular Distribution Measurement of
 $^{148}\text{Nd}(^{16}\text{O}, ^{16}\text{O})$ and $(^{16}\text{O}, ^{16}\text{O}')^{148}\text{Nd}(0.301\text{MeV})$

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In order to study the relation between the Coulomb-nuclear interference and Coulomb coupling phenomena in heavy ion reaction, angular distribution have been measured for $^{16}\text{O}+^{148}\text{Nd}$ colliding system. From the existing experimental results, one can achieve, there are two kinds of angular distributions of heavy ion elastic and inelastic scattering: there is no interference in the case of strong Coulomb coupling and there is interference in the case of weak Coulomb coupling. Jiang Chenglie suggested that these are two independent phenomena and they are not correlated.

The experiment was performed at HI-13 tandem accelerator of Institute of Atomic Energy, using a 90.9 MeV ^{16}O beam. An enriched ^{148}Nd self-supporting target was used which was supplied by GSI of West Germany. The thickness of target is about $30\mu\text{g}/\text{cm}^2$. A Au-Si surface barrier detector was fixed at $\theta_L = 35^\circ$ as a monitor. Ejected ions ^{16}O were momentum analyzed by a G120L Q3D magnetic spectrometer and detected by a gas filled heavy ion focal plane detector system. The first excited state group can be separated well from the ground state of ^{148}Nd .

The angular distribution of elastic and inelastic scattering were measured at $\theta_L = 10^\circ - 87^\circ$ in step $2^\circ - 5^\circ$. At some angles, measurements were made on the 7^+ and 8^+ charge states of ^{16}O so that the data could be corrected for the effect of the energy-dependent charge-state distributions. The data were collected by a VAX-11/780 computer online data acquisition system and a CANBERRA 88 series multichannel computer system simultaneously.

The result is under analyze.

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- [1] Jiang Chenglie, Proceedings of Beijing International Symposium on Physics at Tandem, Beijing, China, May 26-30 (1986) p215.