

Measurement of Neutron Total Cross-Sections at the Pohang Neutron Facility

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We report the status of the Pohang Neutron Facility which consists of an electron linear accelerator, a water-cooled Ta target, and a 12-m time-of-flight path. It has been equipped with a four-position sample changer controlled remotely by a CAMAC data acquisition system, which allows simultaneous accumulation of the neutron time of flight spectra from 4 different detectors. It can be possible to measure the neutron total cross-sections in the neutron energy range from 0.1 eV to few hundreds eV by using the neutron time-of-flight method. A ⁶LiZnS(Ag) glass scintillator was used as a neutron detector. The neutron flight path from the water-cooled Ta target to the neutron detector was 12.1 m. The background level was determined by using notch-filters of Co, In, Ta, and Cd sheets. In order to reduce the gamma rays from Bremsstrahlung and those from neutron capture, we employed a neutron-gamma separation system based on their different pulse shapes. The present measurements of several samples (Ta, Hf, and Mo) are in general agreement with the evaluated data in ENDF/B-VI. The resonance parameters were extracted from the transmission data from the SAMMY fitting and compared with the previous ones.

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