

Cross Section Measurements and Analysis at Rensselaer

Report at CSEWG 2004

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Measurements Completed This Year

- Rh
 - Used 7 metallic samples, thickness range of 1-100 mils.
 - Thermal (0.005-20 eV) and epithermal (5-1000 eV) transmission and capture measurements.
- Mo
 - Performed experiment in the epithermal range with thick metallic samples (100-250 mils).
- ^{164}Dy
 - 7 liquid (D_2O) samples were prepared with 98% enriched ^{164}Dy . Two metallic Dy samples also used.
 - Epithermal transmission and capture measurements were completed.

Measurements Completed This Year (Continued)

- Developed a method to use the RPI multiplicity detector for alpha (σ_{γ}/σ_f) measurements.
 - First test measurements using ^{235}U were completed.
 - The results will be used to design future experiments.

Planned Measurements

- Transmission and capture on Re, ^{153}Eu and F.
- ^{236}U
 - Transmission thermal and epithermal measurements were done with sample of 89.2% enrichment.
 - 0.5 g enriched 99.8% ^{236}U sample has been located for capture measurements.
- Alpha for ^{235}U
 - Thermal to ~ 50 eV

Data Analysis

Sample	Status
Nb	Analysis completed.
Gd	Analysis in final stage.
Rh	Transmission analysis started (using SAMMY)
Cd	Data analysis started

New Capabilities

- Transmission Measurements at 100 m flight station with a large Neutron Detector (~104 cm x 70 cm)
 - Allows high energy and resolution transmission and spectra measurements in the energy range 0.5-10 MeV.
 - In development, first measurement being planned.
 - Detector and electronics obtained and are now being tested.
- LINAC Injector Upgrade
 - Provide shorter pulses (<10 ns), higher current (several amperes peak current), better emittance, commercially available spare parts
 - Installation under way – completion expected middle of next year.

New Capabilities - Fission

- Measurements of the kinematics of fission fragments of small samples
 - Use:
 - A double gridded fission chamber
 - Lead slowing down spectrometer
- The detector was designed and constructed and is now being tested.
- A ^{252}Cf sample (on very thin backing) for offline tests is now in preparation at ORNL.
- First runs with a ^{235}U sample are expected next year.

