

Session V
Progress in Transmutation Physics
Experiments and Nuclear Data

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Notable Achievement or Progress

Nuclear Data:

- Uncertainty analysis showed large progress. We can estimate errors in reactor physics parameters caused by errors of nuclear data by using sensitivity analysis technique and covariance data.
- Differential measurements of MA nuclides are in progress.

Physics Experiment:

- Subcritical experiments are under way in YALINA and planned in GUINEVERE and KUCA.
- First reactivity determination from beam trips at YALINA
- J-PARC Transmutation Experimental Facility is now under the Check and Review of Atomic Energy Commission of Japan.

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Items to be done for future development

Nuclear Data:

- Discussion on the accountability or traceability of error data will be necessary, if we use the uncertainty analysis in the safety evaluation of the transmutation system.
- Differential measurements of MA and Pu isotopes are still needed, though they must be complemented by integral experiments and better covariance matrices evaluations.

Physics Experiment:

- We have still very few experiences for the simulation of the transmutation systems: both critical and subcritical.

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Technical Obstacle for Further Development

Nuclear Data:

- To measure the MA data, the sample preparation and its handling are the bottlenecks.

Physics Experiment:

- Same as above
- Facilities are very expensive to build and to operate

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Recommendations for Development of P&T

Nuclear Data:

- Nuclear data improvements needed for early optimization and selection of systems and fuel cycle options
- Establishment of an international framework to share the efforts on differential measurements, integral validations, and data evaluations is highly recommended. OECD/NEA can play an important role in this field.

Physics Experiment:

- Validation of licensing and operation procedures at increasing realism on complexity, neutron source type and power levels.
- Coupling of a sub-critical system with a spallation source is to be demonstrated.
- Critical and sub-critical experiments using MA fuels will be the next step to realize transmutation systems.