

SUBGROUP 8

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Integral Data Test for Minor Actinide Data

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Fast reactor benchmark

A. Benchmark Calculation for the FCA-IX critical assembly

Using the JENDL-3.2 open at June 1994, the FCA-IX assembly series (Ref.1, 2) were analyzed and compared with the results calculated with the old file JENDL-3.1. Their results were reported at the meeting in May 1994 in Oak Ridge.

The effective multiplication factors calculated with JENDL-3.2 gave remarkable improvement for the underestimate of JENDL-3.1. The C/E values for the central

fission reaction rate ratios of Np-237, Pu-238, Am-241 and Am-243 to U-235 calculated with JENDL-3.2 are several percent smaller than those of JENDL-3.1. The dependencies of the C/E values on the core spectrum were considerably observed.

#### B. Analyses of irradiated actinides data at PFR (Ref. 3)

The 21 actinide nuclides have been irradiated by using the fast reactor core of PFR on the period from 1985 to 1988. The total irradiated net times were 550 days. The irradiated oxide sample nuclides are as follows:

Cm-248, Cm-246, Cm-244, Cm-243

Am-243, Am-241

Pu-244, Pu-242, Pu-241, Pu-240, Pu-239, Pu-238

Np-237

U-238, U-236, U-235, U-234, U-233

Pa-231

Th-232, Th-230

These samples have been analyzed with the use of mass spectrometry and alpha spectrometry at ORNL, and they have being measured at JAERI under the cooperation program between Japan and U.S. in OMEGA project.

These analyzed data are collected and investigated to use as the present benchmark data for the minor actinides.

In 1994, two samples of U-235 and U-238 were analyzed and burnup rate and the amount of generated isotopes were obtained (Ref.4) with the mass and alpha spectrometry in the new facility NUCEF ( Nuclear Fuel Cycle Safety Engineering Research Facility). The analyses for Pu, Am and Cm will be begun in this year 1995 using this new facility. And the burn up calculations will be performed in this year.

## References

- 1) T. Mukaiyama et al.: Actinides Integral Measurement in FCA Assemblies, Nuclear cross Section for Technology, Proc. Inter. Conf., Santa Fe, May, 1985.
- 2) S. Okajima et al.: Evaluation and Adjustment of Actinides Cross Sections Using Integral Data Measured at FCA, Nuclear Data for Science and Technology, Proc. Inter. Conf. Mito, 1988.
- 3) Y. Nakahara et al.: Pure Actinides Samples Irradiated at PFR - Calculations by ORIGEN 2 -, private communication, 1993.
- 4) N. Kouno et al.: Analyses of U-235 and U-238 Samples Irradiated Fuel at PFR (I), private communication, 1994.