SUBGROUP 3 "ACTINIDE DATA IN THE THERMAL ENERGY RANGE"

A meeting of the subgroup 3 "Actinide Data in the thermal energy range" was held on December, 3, 1990 in the NEA Data Bank in Saclay. H. Weigman (Geel), C. Wagemans (Geel), L. Weston (Oak Ridge), Y. Kikuchi (JAERI) and H. Tellier (Saclay) were present. M. Caro (Wurenlingen) also attended this meeting.

The main purpose of this meeting was the review of all the problems which occur for the actinide nuclear data in the thermal energy range. All these problems are related to the bad calculation of the temperature coefficient of the thermal neutron reactors. The major actinides were successively reviewed. The crystaline binding effect was also mentioned.

URANIUM 238

The recent measurements of the uranium 238 capture cross section which were performed at Geel with a metal sample and an oxide sample confirm the 1/v shape of the cross section in the thermal and subthermal energy range. It was decided to adopt this shape. Consequently the modifications of cross section which were proposed in the past by the reactor physicists must be droped.

URANIUM 235

b) Fission

The three measurements of Oak Ridge, Geel and NBS are in good agreement above 20 meV. They are also well reproduced by the recent evaluated files. But only the Geel experiment gives informations at very low energy. JEF 2.0 follows this Geel measurement but ENDF/B5 doesn't.

C) Eta

Whith the preliminary results of Oak Ridge, we have now four recent measurements of eta in the low energy range. Two of them (Geel and Grenoble) indicates a slope, the two others (Harwell and Oak Ridge) do not. It was assumed that the discrepancy between these two sets of results could come from the magnitude and the type of corrections that must be made to the raw data. To try to solve this discrepancy it was propose to initiate a special meeting between the experimentalists who were involved in the various measurements

d) Alpha

Dr Weigman from Gell presented the preliminaey results of an Â measurement between 2 and 300 meV. Assuming a flat behaviour

of nu bar this measurement gives eta values perfectly consistent with the direct measurement. It is an important result because it is the only measurement of alpha in the subthermal energy range.

PLUTONIUM 239

a) Nu-bar

The Gwin measurement and the Fort calculation clearly show a structure of nu-bar in the vicinity of the first resonance. This shape was adopted in JEF2. On the contrary, all the other files used a flat nu-bar.

b) Fission

Wagemans noticed that it could exist a small discrepancy in the peak of the first resonance due to a normalization problem. The JEF2 evaluation agree quite well with the Geel results which were available after the evaluation.

PLUTONIUM 240

Two recent experiments (Liou and Spencer) desagree for the capture width of the 1.056 eV resonances. Irradiated fuel analysis suggest the older value. This point must be more studied in the future.

Although it is not relative to actinide data, the problem of the cristaline binding in uranium oxide was mentionel. This effect can have an importance in the temperature coefficient calculation.