^{238}U Capture and Inelastic Scattering Cross Sections

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^{238}U (n,n') CROS SECTION

Comparisons of the ^{238}U(n,n') cross sections in ENDF/B-IV, JEF-2 and JENDL-3 show that the evaluated total inelastic cross sections are not so different over whole enery range, and, however, partial inelastic cross sections compiled in ENDF/B-VI and JENDL-3 are disagree with each other in their shapes and values. The total inelastic cross section can be quantitatively evaluated taking account of the others i.e. the total, capture, elastic, fission, particle emission, and non-elastic cross sections. There are scarce data base for the individual partial inelastic cross sections enough to evaluate them. A method to determine their values is that the results calculated from appropriated models are adjusted in order to reproduce avilable experiments. This has been the way applied in the early evaluations and must be employed in the sub-group work.

The new experiment performed at Argonne National Laboratory [1], which was introduced at the last meeting held at ECN Petten, May 1991, give us valuable data base to re-evaluate ^{238}U (n,n') cross sections. The ANL data were measured from 4.50 to 10.00 MeV. They are been analyzing by Drs S. Chiba (JAERI) and A.B.Smith (ANL). The first round fit of the data was finished. Their results are informed in a private communication from Chiba (1992) [2].

They used the real part of Walter-Guss spin-orbit potential, deformation parameters of Lagrange ($\beta_2 = 0.216$, $\beta_4 = 0.067$), and coupling scheme of $0^+ - 2^+ - 4^+$. Furthermore, the ANL date were supplemented by 1.5, 2.5 and 3.4 MeV data measured by Haouat et al. [3] and a Chinese 14.2 MeV date [4]. They have obtained a set of Optical Model Parameters. The calculated angular distributions of scattered neutrons agree with the experiments to some extent but the total cross sections caluculated from the same parametes are disagree with available measurements. They are planning to proceed the next analysis.

We expect the parameters deduced from their study. They must be applicable to the evaluation in our group. There are recent publications [5, 6] to be referred in the next evaluation.

^{238}U (n,γ) CROSS SECTION

Froehner [7] reports that the ^{238}U (n,γ) data in JEF-2 satisfactorily reproduce integral experiments.

References

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