

International Collaboration in Measurement of Differential Nuclear Data for
Energy Applications in the Frame of the NEA Nuclear Science Committee

STATUS REPORT ON THE NEANSC INTERLABORATORY
COLLABORATION ON ACTIVATION CROSS-SECTIONS

Chairman D. Smith, Argonne NL, USA

This Interlaboratory Collaboration was formed during the NEA Specialists' Meeting on Activation Cross Sections (Argonne, September 1989). Two formal projects were successfully completed. One was on an intercomparison of calculated cross-sections for $^{60}\text{Co}(n,p)^{60}\text{Fe}$ (coordinated by S. Cierjacks[†]) and the second project was an intercomparison of measurements methods (coordinated by H. Vonach).

Since then most of the activities have been between individuals of this ILC and several reports on collaborations have been presented at the IAEA Research Coordination Meeting on "Activation cross-sections for the generation of long-lived radionuclides of importance in fusion reactor technology"¹ and at the occasion of the International Workshop on Nuclear Data for Fusion Reactor Technology,² both held in Del Mar, California, May 1993.

Since the Del Mar meetings collaborative research continued. As an important example, there was a collaboration between D. Smith and Y. Ikeda and Y. Uno of the FNS Laboratory, JAERI, Tokai on an extensive series of activation cross-section measurements, and other measurements related to activation processes: (1) measurements on the reaction cross-section for the $^{179}\text{Hf}(n,2n)^{178\text{m}2}\text{Hf}$ process which is of concern for long-term radioactive waste disposal for fusion reactors (2) measurements of a whole range of activation cross-sections associated with reactions on structural materials produced by 23 MeV neutron bombardment (3) examination of the applications and consequences of several neutron activation reactions which lead to short-lived activities (a few seconds to a few minutes). As a consequence of these latter experiments it has been found that the activation of water in the ITER fusion reactor is a problem which may impact on the design of this facility.

This collaboration between Argonne and JAERI has been very productive and it is expected to continue over the next several years.

There is also an ongoing collaboration between JAERI FNS and several universities in Japan (Nagoya, Tohoku and Osaka Universities) in a series of activation cross-section measurements involving short-lived activities. JAERI-FNS has also been collaborating with staff at JT-60, The Japanese Tokamak Facility at Naka, concerning development of neutron dosimetry techniques for this facility. These measurements have all involved activation cross-section reactions.

Collaborations continue between researchers from several countries (including both NEA and non-NEA Members) under the auspices of the IAEA. In particular, the Coordinated Research Programme (CRP) on activation cross-sections for long-lived nuclides has fostered a substantial amount of work on activation cross-sections. Much of this work goes far beyond the original mission of this CRP and amounts to a loosely organized extensive network of researchers in the activation field. A paper on the work of this CRP and the network will be presented by D. Smith at the Gatlinburg Conference.³

The Chairman of this ILC stresses the importance to maintain the on-going framework for collaboration in the area of activation processes. Without international frameworks for collaboration, such as NEA and IAEA, exchange of scientists and concentration of activities on important issues should be strongly hampered. However there are too many committees around requiring preparation of progress reports, keeping up of various mailing lists, etc. taking away time from

research for a community which is already nearly subcritical. In the case of activation, the interest is world-wide, and it would be a worthwhile goal to merge the activities and groups sponsored separately under the NEA and the IAEA into one world-wide organisation which addresses activation work.

REFERENCES

1. A.B. Pashchenko, INDC(NDS)-288, "Activation Cross Sections for the Generation of Long-lived Radionuclides of Importance in Fusion Reaction Technology" Del Mar, California (USA), IAEA Nuclear Data Section, Vienna (November 1993).
2. E. Cheng, F. Mann, D. Ruane and G. Howell, Proceedings International Workshop on Nuclear Data for Fusion Reactor Technology, May 3-6, 1993, Del Mar, California (1993).
3. D.L. Smith and A.B. Pashchenko, "Investigation of the Generation of Several Long-lived Radionuclides of Importance in Fusion Reactor Technology: Report on a Coordinated Research Program Sponsored by the International Atomic Energy Agency", This Conference.

Table 1: Contributors to the IAEA coordinated research program on activation cross sections for long-lived nuclides

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