

Progress Report

For the period of September 2008-April 2010
To the NRDC Meeting (20-23 April 2010, Sapporo, Japan)

ATOMKI NUCLEAR REACTION DATA GROUP
Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI)
Debrecen, Hungary

Tárkányi F., Takács S., Király B., Ditrói F., Szelecsényi F., Kovács Z., Csikai J.

Introduction

The main task and profile of the Atomki Nuclear Reaction Data Group has not changed: measurement, compilation, evaluation and application of low and medium energy charged particle nuclear reaction data. The activity is going on in the frame of international collaborations. Measurement, compilation and evaluation are connected to international projects and to the everyday applications at the home institute and at institutes of collaborating partners: Vrije Universiteit Brussels (Belgium), Tohoku University (Japan), Forschungszentrum Jülich (Germany), Institute of Physics and Power Engineering (Russia), IAEA (Austria), National Institute of Radiological Sciences (Japan), iThemba Laboratory (South Africa).

Experimental works

During the last years we have continued the systematic measurement of excitation functions of charged particle reactions up to 100 MeV for many different applications: production of medical radioisotopes, excitation functions of monitor reactions, activation cross sections for accelerator technology and for Thin Layer Activation (TLA).

Compilations and evaluations

EXFOR compilations

During the August 2008 – April 2010 period all new works from Debrecen, Brussels and Jülich were compiled.

Database for fusion evaluated nuclear data library

The Debrecen Group is participating in extension of FENDL library with p- and d-activation libraries in the frame of an IAEA CRP.

- Proton and deuteron activation cross sections were compiled up to 100 and 50 MeV, respectively.
- The total number of reactions is around 1000.

- Targets: Ag, Al, C, Co, Cr, Cu, Fe, Li, Mn, Mo, N, Nb, Ni, O, P, S, Sb, Si, Sn, Ta, Ti, V, W, Au, Cd, In, Ir, Mg, Pb, Pd, Pt, Rh, Y, Zn, Zr.
- The preparation of the list of the missing, duplicated and wrong EXFOR entries is in progress.

Database for thin layer activation technology

In collaboration with the IAEA development of a recommended nuclear reaction cross section database for thin layer application is in progress. The database includes around 50 nuclear reactions.

Nuclear data service

The ATOMKI group continues to distribute compiled or evaluated cross section/thick target yield data for low and medium energy charged particle induced nuclear reactions mainly for cyclotron applications according to the requirements.

Refereeing new publications in the field of nuclear reaction data

The members of the group perform an extensive referring work for different journals in the field of nuclear reaction data and applications for long time. The work gives significant help to improve the quality of the published results.

Staff

The staff connected to the experimental nuclear reaction data measurement consists of six physicists and two chemists. Out of them three (B. Király, S. Takács, F. Tárkányi) physicists are working in part time on data compilation and evaluation. All are engaged in practical application of the ATOMKI cyclotron.

Future plans

Continuation of the present activity.

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