

Compilation of nuclear reaction data from the RIBF in 2015

D. Ichinkhorloo,^{*1} M. Aikawa,^{*1,*2} S. Ebata,^{*1} S. Imai,^{*3} N. Otuka,^{*2,*4} A. Sarsembayeva,^{*1} and B. Zhou^{*1}

Nuclear data such as the data of cross sections, radiations emitted from radioactive isotopes, level properties of isotopes are used widely in many fields. Nuclear data play a key role in understanding the nature of nuclear structures and nuclear reactions. On the other hand, as the fundamental input to various codes for nuclear applications, they are also very important in medical radiotherapy, shielding and radiation protection, and some related engineering works. Therefore, it is of great significance to build a nuclear database for providing nuclear data service in various fields.

EXFOR¹⁾ is the name of the data library containing experimental nuclear reaction data. The EXFOR library contains numerical data, bibliographic information, and experimental information including sources of uncertainties. On the contrary, such data and information can be retrieved from the database by nuclear data users. Additional information, such as experimental setups, is also available.

Experimental data are found in the EXFOR database, which is maintained by the International Atomic Energy Agency (IAEA)²⁾ and the International Network of Nuclear Reaction Data Centres (NRDC). The NRDC collaborates for database compilation and related software development. One of the NRDC members is the Hokkaido University Nuclear Reaction Data Centre (JCPRG)³⁾. JCPRG has contributed to about 10 percent of the data on charged-particle nuclear reactions in the EXFOR library. In the JCPRG, compiled nuclear reaction data in the NRDF (Nuclear Reaction Data File) and EXFOR formats are available through the online search system of the NRDF and EXFOR libraries¹⁾, respectively.

Under collaboration with the NRDC network, experimental data published in scientific journals are continuously surveyed. Among the data obtained, the charged-particle and photon induced data obtained from the facilities in Japan should be compiled by JCPRG. The compiled files of nuclear data produced at the RIBF are translated into the EXFOR format for the benefit of nuclear data users. In this article, we report on our activities in 2015, especially the compilation of experimental nuclear reaction data from the RIBF.

In 2015, we compiled 29 new papers reporting on experiments performed in Japan. Among them, 11 papers were from the RIBF data and satisfied the compilation scope of the EXFOR library. All data are

accessible by the entry numbers listed in Table 1. For higher quality of contents, the corresponding authors were requested to provide numerical data of the compiled papers. Most of the compiled RIBF data in 2015 are provided by the authors. Such additional information is also available with a list of compiled RIBF data on the JCPRG website.

Table 1. Entry numbers with references compiled from the RIBF data in 2015

Entries	E2461 ⁴⁾	E2462 ⁵⁾	E2463 ⁶⁾
	E2465 ⁷⁾	E2466 ⁸⁾	E2467 ⁹⁾
	E2468 ¹⁰⁾	E2471 ¹¹⁾	E2473 ¹²⁾
	E2474 ¹³⁾	E2482 ¹⁴⁾	
Total	11		

We established an effective procedure to compile all of the new publications during the last five-year collaboration with the RIKEN Nishina Center. Therefore, most of recent experimental nuclear reaction data from the RIBF have successfully been compiled in the EXFOR library. It is recommended that such collaboration should be further developed for experiments at the RIBF. By using these compilations, experiment data from the RIBF can also be served in a more convenient and fast manner for nuclear research and studies in other fields.

References

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^{*1} Faculty of Science, Hokkaido University

^{*2} RIKEN Nishina Center

^{*3} Institute for the Advancement of Higher Education, Hokkaido University

^{*4} NDS, IAEA