EXFOR compilation of RIBF data in 2020

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Nuclear reaction data support the most essential part of nuclear technologies (power production, nuclear fuel cycles, environmental monitoring, dosimetry, radiation safety, radioisotope production, radiotherapy, and medical diagnostics, etc.) and sciences (nuclear physics, nuclear chemistry, geophysics, and astrophysics). Nuclear databases are compilations of measured reaction data, and they play a vital role in providing the best estimate for nuclear reactions to various science fields and related areas. One of the largest and globally used public nuclear reaction databases is the EXFOR library (EXchange FORmat for experimental nuclear reaction data).[1] The EXFOR library is a universal common repository for nuclear reactions established in 1967. The International Network of Nuclear Reaction Data Centres (NRDC) maintains the EXFOR library under the auspices of the International Atomic Energy Agency (IAEA).[2] The EXFOR library covers a wide range of nuclear reactions such as neutron-, charged-particle- and photon-induced reactions.

Our group, the Hokkaido University Nuclear Reaction Data Centre (JCPRG),[3] was founded in 1973 and joined the NRDC as the first member of the Asian countries in 1975. We are responsible for the compilation of the charged-particle- and photon-induced nuclear reactions measured in Japanese facilities.[4] Our contributions to the EXFOR database reaches approximately 10% of the total amount. The database compilation process involves the scanning of peer-reviewed journals for published papers within the EXFOR scope. A unique entry number is assigned to each selected paper to be compiled for the EXFOR library. We extract the information of the bibliography, experimental setup, measured physical quantities, measured numerical data and uncertainties. The information is input in a single entry of EXFOR. During this process, we contact the corresponding authors for questions on the contents of the papers and requests for numerical data.

JCPRG has been cooperating with the RIKEN Nishina Center for the compilation of data obtained by RIBF since 2010, which aims to enrich the availability of RIBF data. In 2020, we compiled 45 new articles produced at Japanese facilities and modified 18 old entries. This includes 17 articles from RIKEN, 15 new articles, and 2 old entries. The compiled data are accessible by entry numbers listed in Table 1. We thank the authors of these papers for their kind cooperation.

Table 1. Entry numbers with references compiled from RIBF data in 2020.

	Entries		
New	E2625[5]	E2626[6]	E2633[7]
	E2634[8]	E2641[9]	E2644[10]
	E2645[11]	E2646[12]	E2648[13]
	E2650[14]	E2652[15]	E2653[16]
	E2654[17]	E2655[18]	E2657[19]
Revised	E2557[20]	E2616[21]	
Total		17	

We acknowledge that collaboration with RIKEN is a great help for us to establish an effective procedure for the compilations. Most RIKEN data are very quickly compiled after publication and end-users can access it smoothly. We also thank all authors of RIKEN articles who kindly provided numerical data. This greatly helps increase the accuracy and quality of the database.

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