EXFOR compilation of RIBF data in 2024

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Experimental nuclear reaction data are crucial for a variety of scientific and practical applications, *e.g.*, particle therapy and nuclear medicine. Databases play a vital role in providing access to these data. One prominent resource is the EXFOR library,[1)] maintained collaboratively by the International Atomic Energy Agency (IAEA) and the International Network of Nuclear Reaction Data Centres (NRDC). NRDC members are responsible for compiling experimental nuclear data and related information for the EXFOR library.

The Hokkaido University Nuclear Reaction Data Centre (JCPRG), a member of the NRDC, compiles nuclear reaction data for charged-particle-induced and photon-induced reactions obtained from experimental facilities in Japan. The compilation process involves surveying experimental papers published in peer-reviewed scientific journals and assigning a unique sequential entry number to each paper. A data file in the EXFOR format is then created for each entry. If necessary, numerical data are either requested directly from the authors or digitized from figures. Preliminary entries, assembled as a Prelim file, are distributed to NRDC members for review. A timeline of over a month is provided for feedback, during which members review and comment on the preliminary entries. Based on these reviews, the entries are revised before being finalized and sent to NRDC members as a Trans file. The finalized entries are then registered in the EXFOR library. This entire process takes several months to complete, after which the data become available in the library.

In 2024, we compiled data from 17 new papers containing experimental results in RIBF. During this process, we occasionally requested numerical data directly from the authors, which significantly enhanced the accuracy and quality of the database. These 17 entries have already been registered and are searchable in the EXFOR library. These entries, along with their data, can be accessed using the entry numbers provided in Table 1 via the IAEA and JCPRG websites.[2,3)]

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Table 1. Entry numbers transmitted in 2024.

E141 (Prelim: 2023/12/4, Trans: 2024/3/16)			
E2760[4)]			
E145 (Prelim: 2024/5/7, Trans: 2024/6/26)			
E2781[5)]			
E146 (Prelim: 2024/5/21, Trans: 2024/6/26)			
E2778[6)]			
E148 (Prelim: 2024/6/11, Trans: 2024/8/13)			
E2779[7)]	E2782[8)]		
E150 (Prelim: 2024/6/26, Trans: 2024/8/16)			
E2699[9)]	E2732[10)]	E2785[11)]	
E151 (Prelim: 2024/11/26, Trans: 2024/12/30)			
E2783[12)]	E2787[13)]	E2788[14)]	E2789[15)]
E2790[16)]	E2791[17)]	E2792[18)]	E2793[19)]
E2798[20)]			

References
1) N. Otuka *et al.*, Nucl. Data Sheets **120**, 272 (2014).
2) IAEA Nuclear Data Services, `https://nds.iaea.org/exfor/`.
3) Hokkaido University Nuclear Reaction Data Centre, `https://www.jcprg.org/exfor/`.
4) K. Teranishi *et al.*, Radiochim. Acta **111**, 589 (2023).
5) M. Aikawa *et al.*, Nucl. Instrum. Methods Phys. Res. B **550**, 165315 (2024).
6) Z. H. Yang *et al.*, Phys. Rev. Lett. **131**, 242501 (2023).
7) P. J. Li *et al.*, Phys. Rev. Lett. **131**, 212501 (2023).
8) N. Ukon *et al.*, Nucl. Instrum. Methods Phys. Res. B **552**, 165348 (2024).
9) Y. L. Sun *et al.*, Phys. Lett. B **814**, 136072 (2021).
10) M. Holl *et al.*, Phys. Rev. C **106**, 034301 (2022).
11) M. Aikawa *et al.*, Nucl. Instrum. Methods Phys. Res. B **554**, 165441 (2024).
12) Y. Shimizu *et al.*, Phys. Rev. C **109**, 044313 (2024).
13) N. R. Ma *et al.*, Phys. Rev. C **109**, 054302 (2024).
14) P. J. Li *et al.*, Phys. Lett. B **855**, 138828 (2024).
15) N. Otuka *et al.*, Eur. Phys. J. A **60**, 195 (2024).
16) Y. Shigekawa *et al.*, J. Radioanal. Nucl. Chem. **333**, 1479 (2024).
17) T. Koiwai *et al.*, Phys. Lett. B **827**, 136953 (2022).
18) D. Gantumur *et al.*, Appl. Radiat. Isot. **213**, 111486 (2024).
19) N. U. Khandaker *et al.*, Radiat. Phys. Chem. **226**, 112272 (2025).
20) M. Aikawa *et al.*, Nucl. Instrum. Methods Phys. Res. B **559**, 165579 (2025).

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