Nuclear Science and Transmutation Research Division
Nuclear Transmutation Data Research Group
Fast RI Data Team

1. Abstract

Fast RI team aims at obtaining and accumulating the cross section data for long lived fission products (LLFPs) in order to explore the possibility of using accelerator for nuclear transmutation.

LLFPs as nuclear waste have been generated continuously in nuclear power plants for wealth for human lives, while people noticed the way of disposal has not necessarily been established, especially after the Fukushima Daiichi power plant disaster. One of the ways to reduce the amount of LLFP or to recover them as recycled resources is nuclear transmutation technique.

RIBF facility has a property to generate such LLFP as a secondary beam and the beam species are identified by event by event. Utilizing the property, absolute values of the cross section of various reactions on LLFPs are measured and accumulated as a database.

2. Major Research Subjects

(1) Measurement of reaction products by the interaction of LLFPs with proton, deuteron, and photon to explore candidate reactions for the transmutation of LLFPs
(2) Evaluation of the cross section data for the neutron induced reactions from the obtained data

3. Summary of Research Activity

(1) Acting as a collaboration hub on many groups which plan to take data using fast RI beams in RIBF facility
(2) Concentrating on taking data for proton and deuteron induced spallation reactions with inverse kinematics
(3) Accumulating the cross section data and evaluating them as evaluated nuclear data
(4) Evaluating cross section of neutron induced reaction on LLFP by collaborating with the nuclear model calculation and evaluation group

Members

Team Leader

Hideaki OTSU (Concurrent: Team Leader, SAMURAI Team)

Visiting Scientist

Takashi TERANISHI (Kyushu Univ.)

Student Trainee

Koichi GOTO (Kyushu Univ.)

List of Publications & Presentations

Publication

[Proceeding]

R. Matsumura, H. Otsu, and H. Wang *et al.*, "Research for nuclear transmutation of high-radiotoxic nuclide ^{90}Sr via proton- and deuteron-induced reactions," JAEA-Conf 2021-001, pp. 225–230 (2022).

Presentations

[Domestic Conferences/Workshops]

松村理久, 大津秀暁, 王赫, 千賀信幸, 他 ImPACT-RIBF Collaboration, 「高放射性核種 ^{90}Sr の陽子及び重陽子誘起反応による同位体生成」, 日本物理学会 第 76 回年次大会, オンライン, 2021 年 3 月.

松村理久, 大津秀暁, 王赫, 炭竈聡之, 千賀信幸, 他, 「中性子入射断面積の評価に向けた安定核 ^{95}Mo の陽子・重陽子入射反応による同位体生成断面積の測定」, 日本物理学会 第 77 回年次大会, オンライン, 2022 年 3 月.

Others

[Master Theses]

松村理久, 修士論文, 「陽子・重陽子入射反応による ^{90}Sr, ^{95}Mo の同位体生成断面積の測定」, 埼玉大学, 2022 年 3 月.

西津美咲, 修士論文, 「^{79}Se に対する 200 MeV/u 陽子及び重陽子入射核破砕反応による同位体生成断面積測定」, 九州大学, 2022 年 3 月.