

Fee-based activities by the industrial application research team

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Fee-based activities conducted by the Industrial Application Research Team (former Industrial Cooperation Team) in 2018, which include the utilization of heavy-ion beams in the industry and distribution of radioisotopes, are summarized below.

RIKEN Nishina Center allows the use of the AVF cyclotron, RILAC, and RIKEN Ring Cyclotron (RRC) by private companies in Japan for a fee.¹⁾ In 2018, four fee-based beamtimes were successfully performed for the irradiation test of space-use semiconductor devices: an 80-hour beamtime with a 70-MeV/nucleon ^{84}Kr beam in February, 40-hour beamtime with a 70-MeV/nucleon ^{84}Kr and 20-hour beamtime with a 95-MeV/nucleon ^{40}Ar in July, and 8-hour beamtime with a 70-MeV/nucleon ^{84}Kr beam in December. The former three beamtimes were at the E5A and the last one was at the E3A beamline, where the clients irradiated their samples in the atmosphere. In addition, we performed a three-hour machine-study beamtime in February with a 10.75-MeV/nucleon ^{136}Xe beam, in which we studied the properties of beam to prepare future fee-based utilizations.

Since 2007, RIKEN has distributed radioisotopes (RIs) to users in Japan for a fee in collaboration with the Japan Radioisotope Association²⁾ (JRIA). The nuclides are ^{65}Zn ($T_{1/2} = 244$ days), ^{109}Cd ($T_{1/2} = 463$ days), ^{88}Y ($T_{1/2} = 107$ days), and ^{85}Sr ($T_{1/2} = 65$ days), produced by the Nuclear Chemistry Research Team (former RI Applications Team) at the AVF cyclotron. According to a material transfer agreement (MTA) drawn between JRIA and RIKEN, JRIA mediates the transaction of RIs and distributes them to users. ^{65}Zn and ^{109}Cd are delivered approximately two weeks after the acceptance of an order. ^{85}Sr and ^{88}Y , which have shorter half-lives, are not stocked like ^{65}Zn and ^{109}Cd but are produced in a scheduled beamtime after an order is accepted. Therefore, they are delivered two months or more after the order is placed. These details can be found on the online ordering system J-RAM³⁾ of JRIA.

In 2018, we delivered three shipments of ^{65}Zn with a total activity of 9.7 MBq, two shipments of ^{88}Y with a total activity of 2 MBq, and no shipments of ^{109}Cd . The final recipients of RIs were a university, a research institute, and a medical research center.

Figure 1 shows the yearly trends in the number of orders and the amount of distributed RIs. Compared with 2017, the amount of distributed ^{65}Zn increased by a factor of 2.6 and that of ^{88}Y remained the same.

We anticipate that the demand for short-lifetime RIs would increase in future and are considering to add

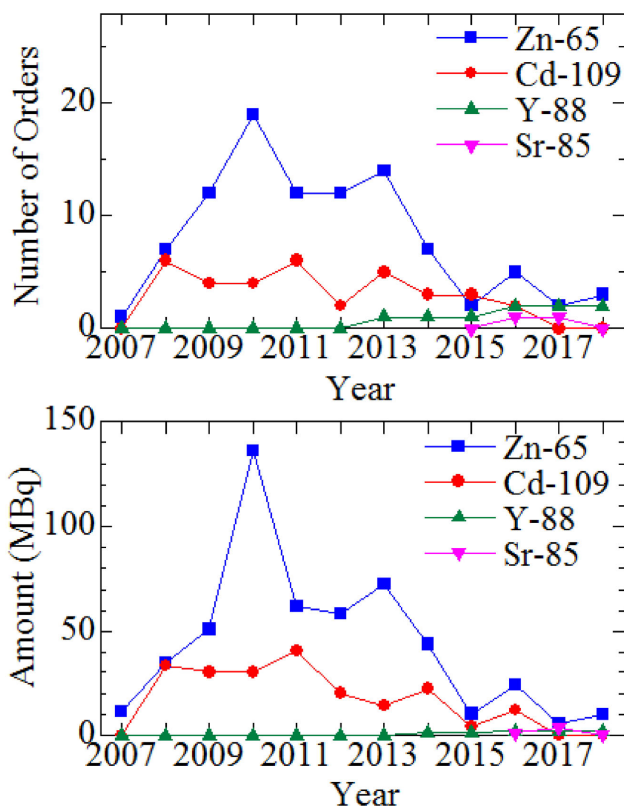


Fig. 1. Number of orders (upper) and amount (lower) of the RIs distributed yearly from 2007 to 2017. The distribution of ^{88}Y started in 2010 and that of ^{85}Sr in 2015.

such RIs to the fee-based distribution. As the first step, we announced the distribution of the new RI ^{67}Cu ($T_{1/2} = 61.8$ h) in August. It will be produced in a scheduled beamtime after an order is accepted.

References

- 1) <http://ribf.riken.jp/sisetu-kyoyo/> (Japanese).
- 2) <http://www.jrias.or.jp/> (Japanese), <http://www.jrias.or.jp/e/> (English).
- 3) <https://www.j-ram.net/jram/DispatchTopPage.do> (Japanese).

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