

Fee-based activities operated by the Industrial Application Research Team

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The fee-based activities operated by the Industrial Application Research Team in 2019, which are the utilization of heavy-ion beams in the industry and the 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⁾ At present, the main users are semiconductor companies that irradiate space-use semiconductor devices with Ar, Kr, or Xe ions from the RRC to simulate single-event effects due to the heavy-ion components of cosmic radiation. Proposals for beam utilization are reviewed by a program advisory committee dedicated to industrial use (InPAC). In July 2019, InPAC held its 9th meeting, where it reviewed and approved two proposals. No fee-based beamtimes were executed in 2019.

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), ^{85}Sr ($T_{1/2} = 65$ days), and ^{67}Cu ($T_{1/2} = 61.8$ hours) produced by the Nuclear Chemistry Research Team (formerly RI Applications Team) at the AVF cyclotron. According to a material transfer agreement (MTA) drawn between JRIA and RIKEN, JRIA mediates the transaction of the RIs and distributes them to users. ^{65}Zn and ^{109}Cd are delivered approximately two weeks after the acceptance of an order. ^{85}Sr , ^{88}Y , and ^{67}Cu , which have short 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 an order. Details can be found on the online ordering system J-RAM³⁾ of JRIA.

In 2019, we delivered no ^{109}Cd , two shipments of ^{65}Zn with a total activity of 6.7 MBq, two of ^{88}Y with a total activity of 2 MBq, and one of ^{67}Cu with an activity of 5 MBq. The final recipients of the RIs were two universities, one research institute, and one medical research center.

Figure 1 shows the yearly trends in the number of orders and the amounts of distributed RIs. Compared with 2018, the amounts of distributed ^{65}Zn and ^{85}Sr decreased and that of distributed ^{88}Y remained the same. The shipment of ^{67}Cu is the first since we started its delivery in August 2018.

In the general trend, the demand for long-lived RIs has drastically decreased, whereas that for short-lived RIs is increasing.

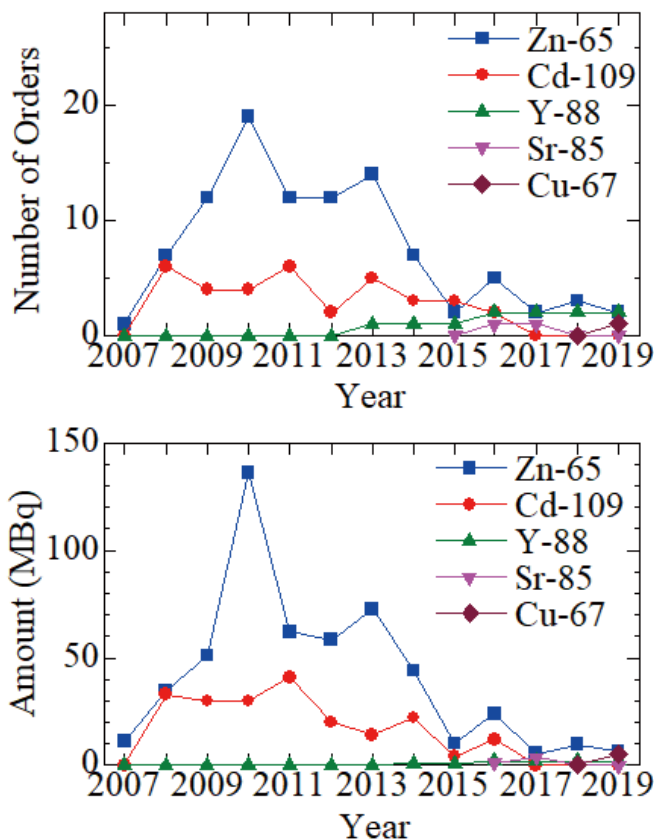


Fig. 1. Number of orders (upper) and amount (lower) of the RIs distributed yearly from 2007 to 2019. The distribution of ^{88}Y started in 2010, that of ^{85}Sr in 2015, and that of ^{67}Cu in 2018.

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://j-ram.org/> (Japanese).

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