

Present status of the liquid-helium supply and recovery system

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The liquid-helium supply and recovery system,¹⁾ which can produce liquid helium at a liquefaction rate of 200 L/h from pure helium gas, had been under stable operation since the beginning of April 2001. As operation failures due to aging-related deterioration has increased in recent years, a new liquefier was introduced in 2017. It can produce liquid helium at a liquefaction rate of 220 L/h from pure helium gas. In the summer of 2018, the older helium liquefier has failed. However, with the new helium liquefier, we can supply liquid helium without stoppage.

The volumes of liquid helium supplied each year from 2001 to 2018 are shown in Fig. 1. The supplied volume gradually increased from 20,000 L to 180,000 L. Owing to a malfunction, the supplied volume decreased in 2014.

The purity of helium gas recovered from the laboratories is gradually deteriorating. At present, the impurity concentration in the recovered gas is about 500 ppm. The impurity concentration does not affect the liquefaction operation, but it is necessary to observe the progress. The volumes of helium gas recovered from each building in Wako campus were measured. The recovery efficiency, which is defined as the ratio of the amount of recovered helium gas to the amount of supplied liquid helium, was calculated to be more than 85% for the buildings on the south side of Wako campus, namely, the Cooperation Center building of the Advanced Device Laboratory, Chemistry and Material Physics building, and Nanoscience Joint Laboratory building.

Reference

- 1) K. Ikegami *et al.*, RIKEN Accel. Prog. Rep. **34**, 349 (2001).

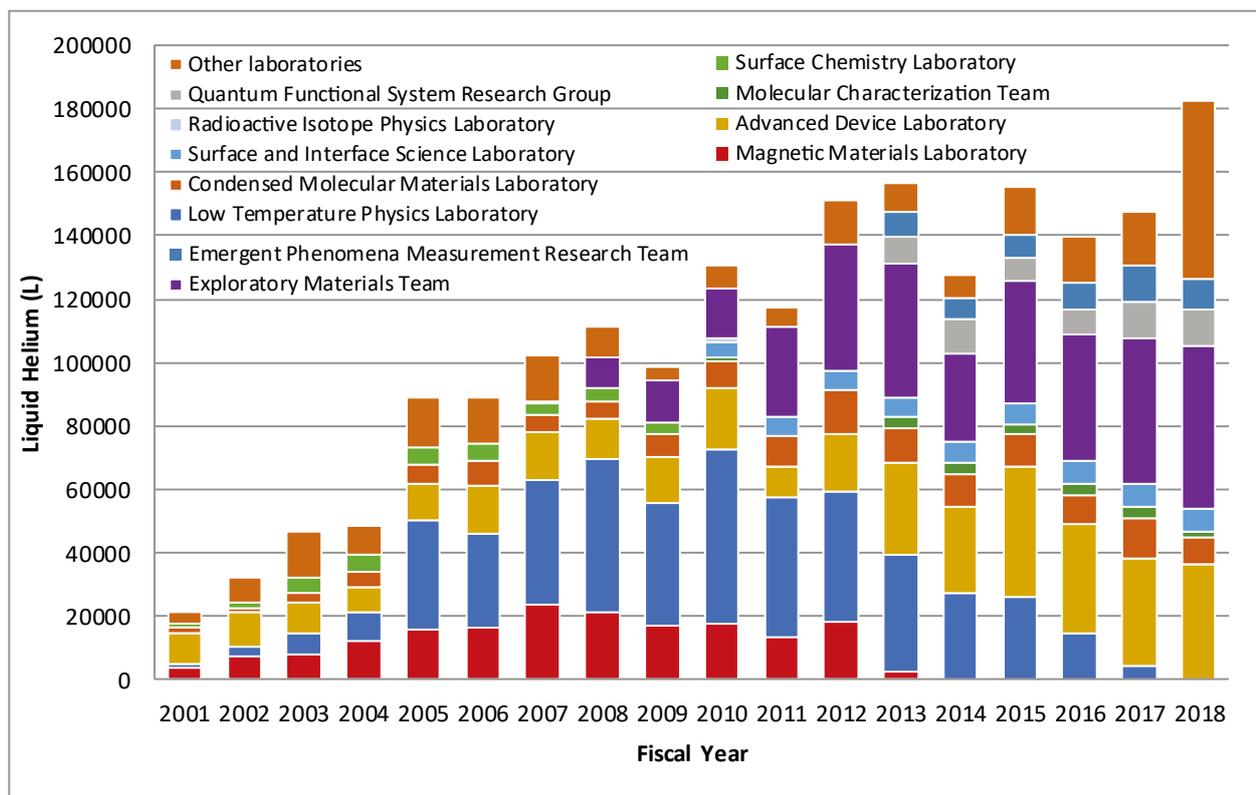


Fig. 1. Volumes of liquid helium supplied to the various laboratories for each fiscal year from 2001 to 2018.

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