

Research for high temperature superconducting wires application for practical applications

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Background

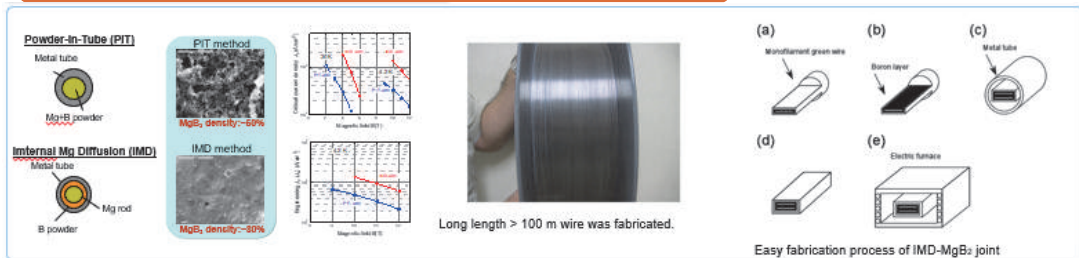
- Superconductor is the only material to achieve “zero” resistance at low temperatures, which is one of the key solutions of environment and energy issues. Development of superconducting wires and tapes to electrical applications is needed for energy saving.

Aim

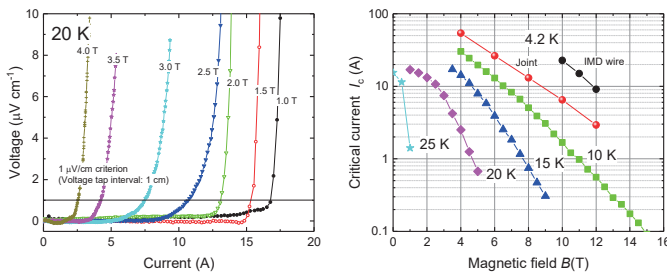
- Achievement of high critical current density, which is possible current to flow per each unit area of electrical wires, is important for superconducting wires; however its value is not yet enough.

Advanced Research Topics

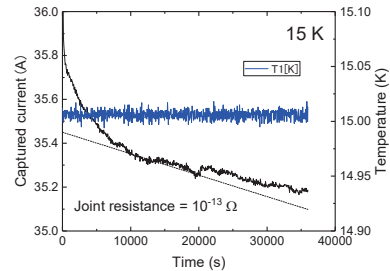
Fabrication process of MgB₂ superconducting joint



Critical current of superconducting joint



Field decay test



Publications

- A. Matsumoto et al., IEEE Trans. on Appl. Supercond. 28, 2018, 6200104.
- A. Matsumoto et al., IEEE Trans. on Appl. Supercond. 28, 2018, 6400504.
- A. Matsumoto et al., Superconductor Science and Technology 27, 2014, 015002.

Applied area and future prospects

- Development of high T_c superconducting wires for MRI magnet
- Development of high T_c superconducting wires for power cables
- Development of high T_c superconducting wires for small magnet

Issues for technology transfer

- Improvement of critical current density
- Cost reductions by the reduction by which it's for an expensive substrate material
- The validity of the whole system even including a cooling system