

Developing New Superconductors



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Research Topics

- Developing new superconductors using hydrogen
- Improvement of cuprate superconductors

Research Seeds

Superconductivity encompasses phenomena such as zero electrical resistance, expulsion of magnetic flux fields, and the Josephson effect below a characteristic critical temperature. Superconductors are anticipated for wider application for MRI, and maglev trains, etc. Nevertheless, superconductors present some important issues. One is that the critical temperature is a very low temperature.

We study the improvement of a critical temperature by the synthesis of new superconductors as follows.

1. Using light elements such as hydrogen.
2. Partial substitution of cuprate superconductors.

First, hydrides have attracted much interest as possible superconductors with high critical temperature because of their phonons with high frequencies because of the small mass of hydrogen.

Second, a critical temperature of cuprate is relevant to the distance of Cu-O(apex). We attempt to extend it by partial substitution.

Related Technology

- Soft-chemical techniques