Superconductivity in science and in engineering

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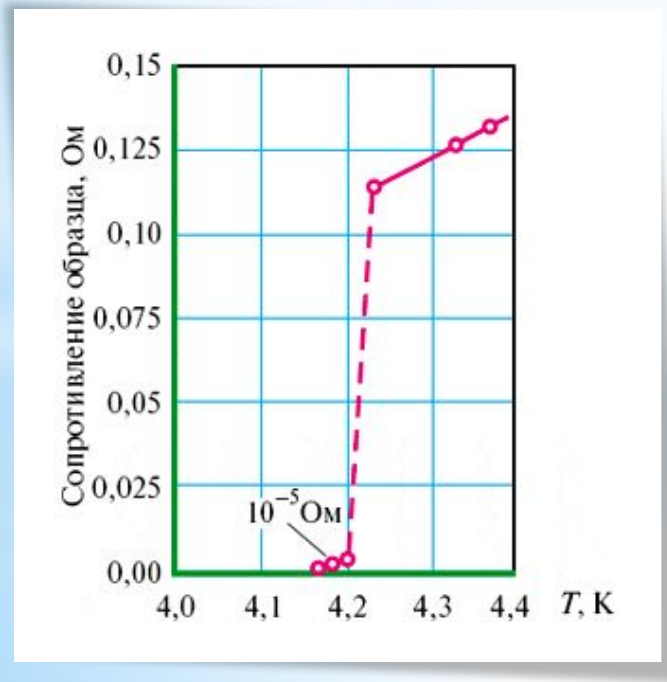
In 1911, the Dutch physicist Kamerling-Onnes found that when the mercury in liquid helium is cooled, the resistance first varies gradually



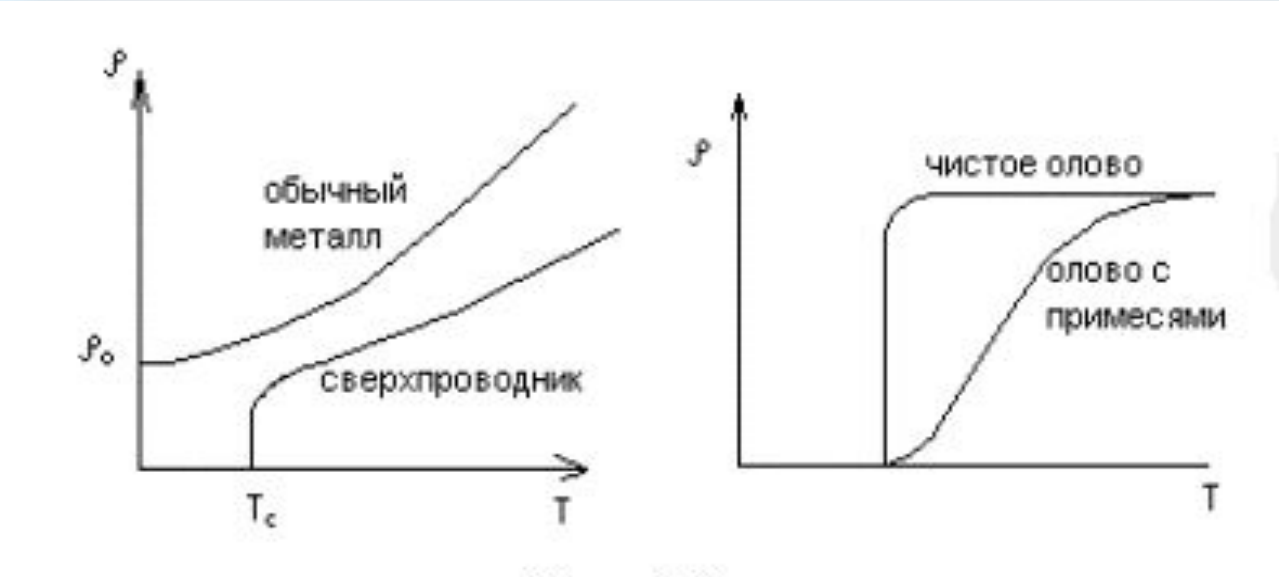
Superconductivity is the property of some materials to have a strictly zero electrical resistance when they reach a temperature below a certain value (critical temperature).

In Physics

Today, superconductors are practically used in physics,
where for many years large research installations
and new devices have been used.

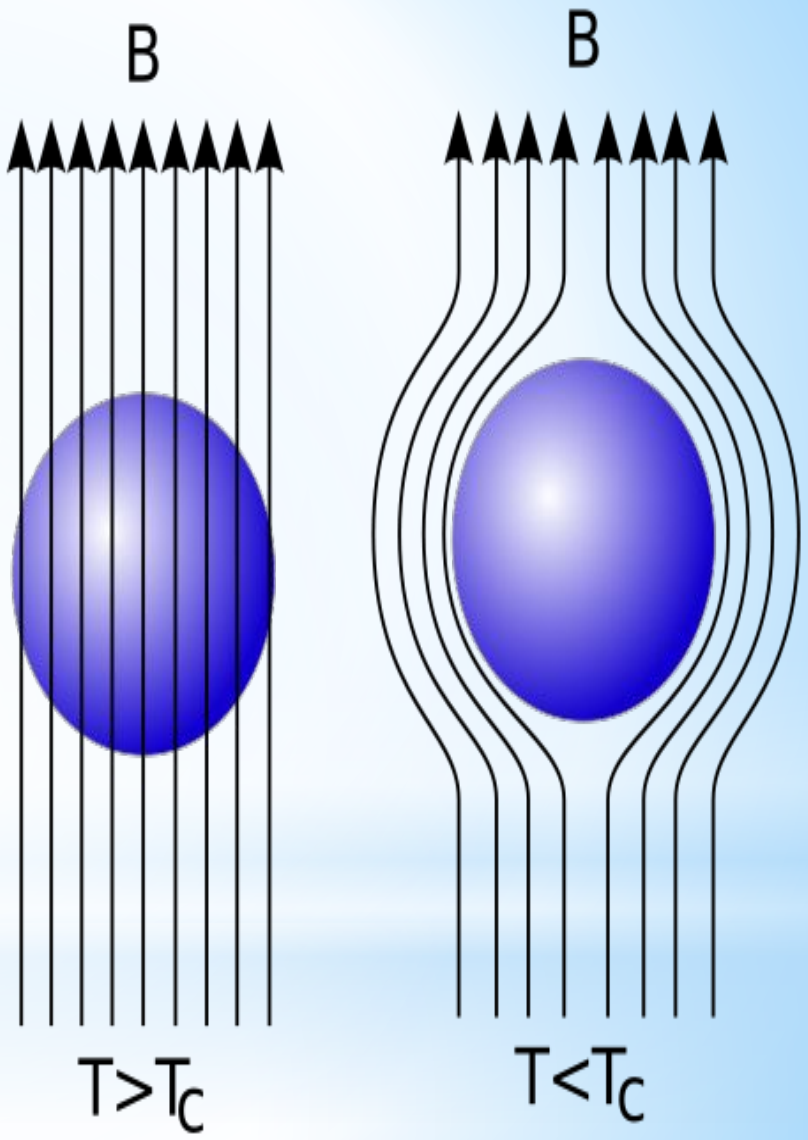
Prior to 1986, superconductors with this property at very low temperatures, below -259 ° C, were known. In 1986-1987, materials were found with a superconducting transition temperature of about -173 ° C.

*Injection of superconductors urity



- The introduction of an impurity into the superconductor reduces the sharpness of the transition to the superconducting state.
  In normal metals, the current disappears in about 10-12 seconds. In a superconductor, a current can circulate for years (theoretically 105 years!).

One of the main differences between superconductors and ideal conductors is the Meissner effect, discovered in 1933. The phenomenon was first observed in 1933 by German physicists Meissner and Oxenfeld



Application of superconductors

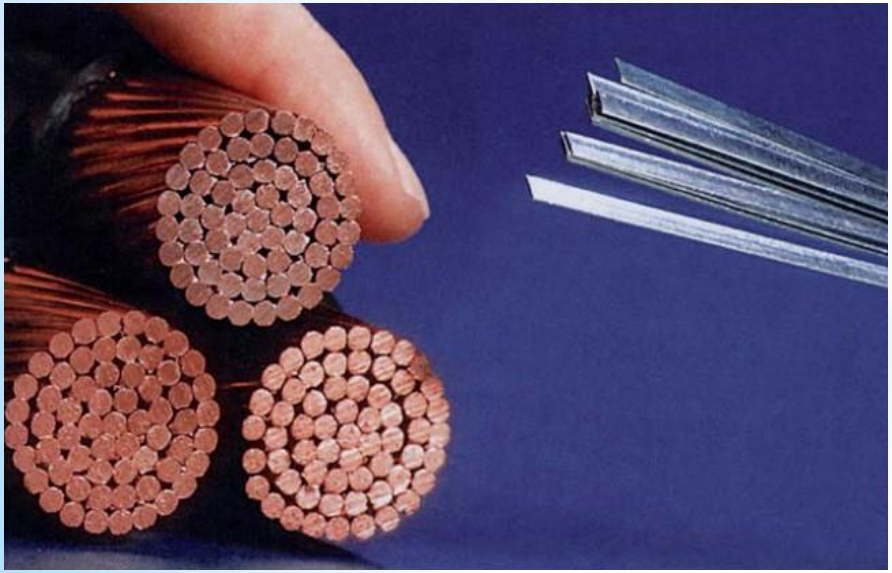
Low-power electronics

- high-speed computing devices
- magnetic field and radiation detectors
- microwave communication equipment

Strengths

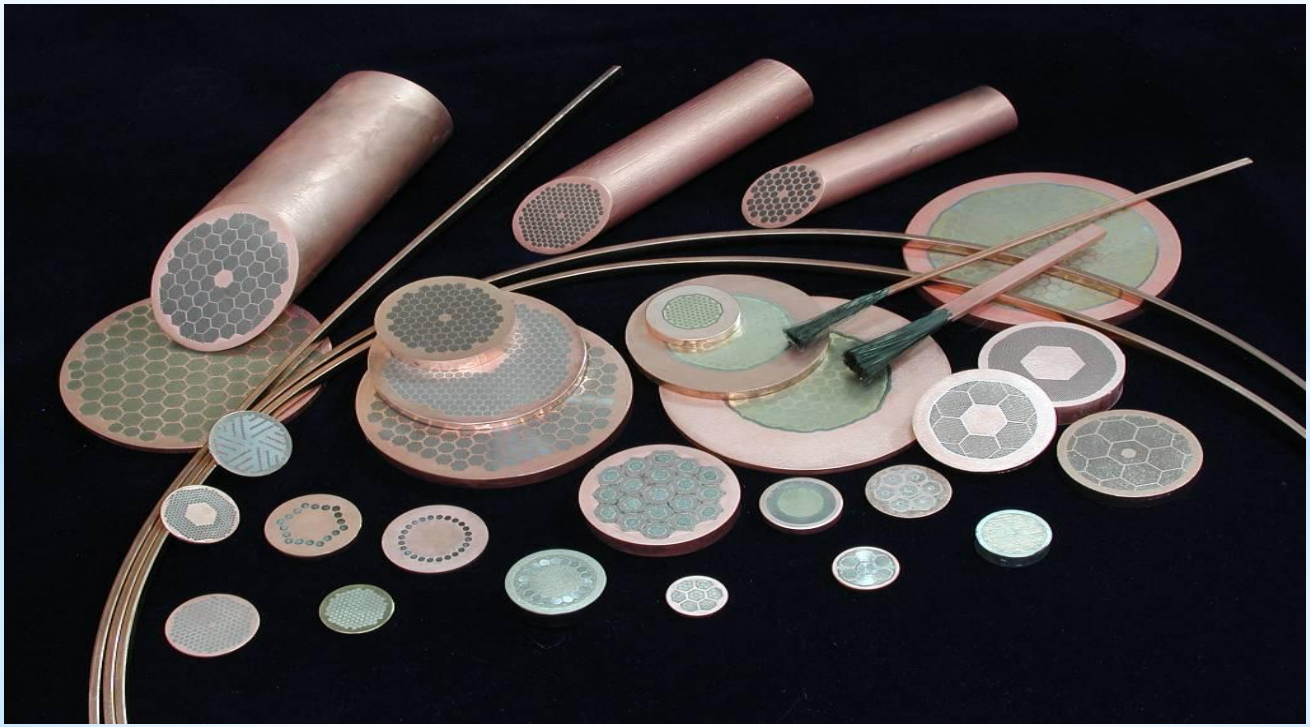
- cables
- current limiters
- magnets
- motors
- generators
- energy stores

In power applications, superconductors can reduce energy losses and reduce the weight and size of equipment.



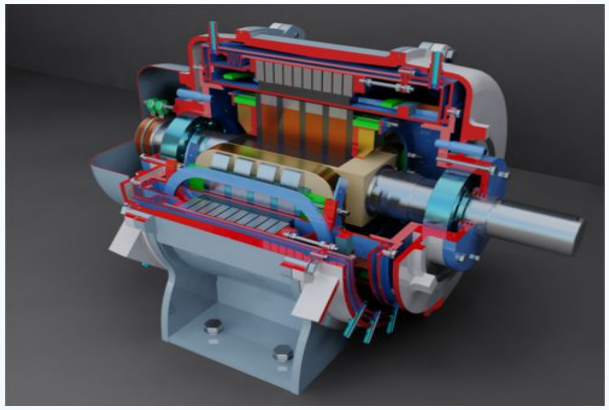
In 10-20 years, superconductivity will be widely used in energy, industry, transport and much wider in medicine and electronics.

In electronics, superconductivity will find wide application in computer technology. Potentially the most profitable industrial application of superconductivity is associated with the generation, transmission and efficient use of electricity.



Engineers have long thought about how it would be possible to use huge magnetic fields created with the help of superconductors for the magnetic suspension of a train (magnetic levitation).

In the long term, joint projects for the construction of cryotransport and railways are possible. The possibility of accelerating macroscopic objects by the electromagnetic field will also find application at aerodromes and cosmodromes, where the SP magnets will provide take-off / landing to aircraft and spacecraft.


Thank you for attention !