Review Paper on Super Conductor Theory and Material

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ABSTRACT: Superconductivity is a solid-state physics phenomenon that arises under a certain critical condition. In certain materials, temperature (often referred to as Tc). A material that is superconducting is characterized by its infinitely high electrical conductivity and the lack of any indoor magnetic field. From several districts of Study has become indispensable, this so-called superconductivity. This paper takes a straightforward approach to clarifying the idea behind Superconductivity and its uses.

KEY WORDS: Conductor, Insulator, Electronegativity, Material, Super Conductor, Super Heater

INTRODUCTION

Superconductors are materials whose components are under the transformation, electrical resistance drops Up to zero temperature. The 1911 Superconductivity discovered by Heike Kamerlingh Ones. Yeah, it's a quantum macroscopic condition. Many metals, but also other materials are superconducting below their critical temperature Tc. For most materials, this temperature is very low; to achieve superconductivity, the material must generally be cooled with liquefied helium whose boiling point is -269 °C. Only in the case of high temperature superconductors is sufficient to be cooled down with liquefied nitrogen whose boiling point is -196 °C. In the condition of superconducting, the interior of the substance remains free of magnetic and electrical fields. An electric field will instantly be degraded by the Movable charge carriers that are non-resistant[1].

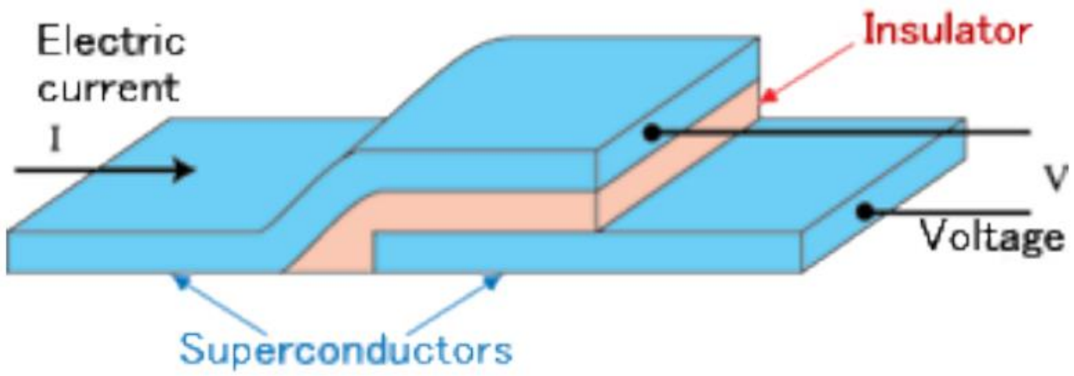

Fig 1: Super Conductor

Fields of Magnetics the design of suitable buildings is displaced by on the surface, shielding currents, which compensate for with a magnetic field of their own, and the inner magnetic field. A magnetic field which is not too intense penetrates just around 100 nm into the material; the material is borne by this thin layer Line and shielding[2]. This "Meissner-Oxfield effect" may be possible, for Levitate, for example, a superconducting sample in the area of magnet the flow of current through the superconductor lowers the temperature of the transition. The transformation when an external magnetic, temperature also decreases applied field. If a critical field reaches the magnetic field, Price, depending on the value, various effects are observed, material[3]. Breaks the superconductivity suddenly, it is called a superconductor of the first kind or the Type I. On the other hand, superconductors of the second kind (Type II) have two critical field strengths; from the lower one, the field begins to penetrate; in the higher one, the superconductivity collapses. In the district in In between, the magnetic field penetrates more and more into the in the shape of microscopically fine tubes, the conductor. The magnetic flux is quantized in these flow tubes[4]. Type I for scientific applications, superconductors are attractive to due to their high capacity for holding current. Superconductivity technological applications for particles, the generation of strong magnetic fields is accelerators, reactors for nuclear fusion, magnetic Levitation of resonance imaging - as well as calculating and measuring technology for energy. In September

1986, the K. Alexander Muller and J. Georg Bednorz had reported that the ceramic substance lanthanum barium copper oxide of 35 Kelvin (even at the relatively high temperature -238 °C) loses any electrical resistance; for this discovery they were awarded the Nobel Prize in Physics the next year.1 Although this transition temperature is still quite low, it is still more than ten degrees higher than the best conventional superconductors which comprise about three dozen elements and several thousand alloys and compounds that have metallic conductivity. Soon thereafter, critical temperatures above 90 K were reported[3]. If it were indeed possible to find a superconducting material at ordinary ambient.

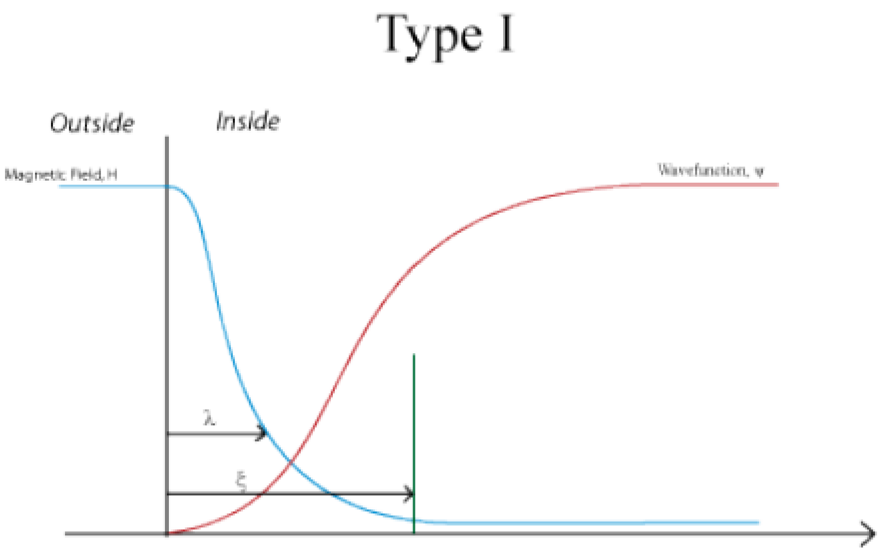

Fig 1: Movement of current in Superconductor

Figure 1 shows the movement of current through the superconductor decreases the temperature of the transition. And, the transition temperature Decreases by applying an external magnetic field. Uh, if the critical value is surpassed by magnetic field, different effects are depending upon the substance observed. Breaks out the suddenly, superconductivity is considered a form of superconductor I[5].

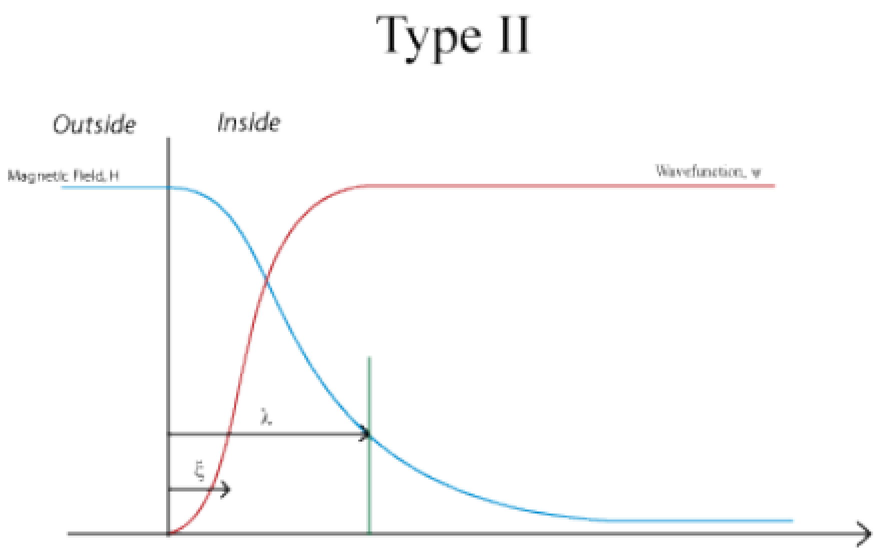

Fig 2: Two Field of Superconductors

Figure 2 shows there are two critical field superconductors of Type II: Strengths; the field begins to penetrate from the lower one; in the higher one collapses with superconductivity. In the district in between, the magnetic field penetrates more and more into the in the form of microscopically fine pipe, the conductor.

Temperatures (around 300 K), this would most likely profoundly change modern technology

Now, with a new mechanism: the magnetic one. Impact of variations in the spin of the atoms Medium for conducting. While this change the temperature is still pretty low, there are still more than ten, Higher grades than the best traditional superconductors that contain three dozen or so superconductors Elements and several thousand compounds and alloys having metallic conductivity[6].

REVIEW OF LITERATURE

There have been many paper published in the field of superconductor and its material among all those papers a paper titled "Recent Progress in Superconductor Theory, Material and Devices by Serap Ogmen discussed about the Cooper pairs as carriers, The symmetry of the wave function, d-wave symmetry, Superconductivity at the room temperature?, Ferrous high-temperature superconductors, Classification of Superconductors, Metallic superconductors, Metallic superconductors, High temperature superconductors, Theory behind the high temperature superconductors, Superconductivity achieved in an unlikely material, Superconductors Under Pressure, Nearly isotropic superconductivity in (Ba,K)Fe2As2[7].

CONCLUSION

Directing what Superconductivity does is without losing energy by unusual physical strength, electricity the creation of so-called Cooper pairs, the phenomenon. Electrons pass through the material in this state without encountering barriers. Engineers in many applications they took advantage of this effect. Sadly, superconductivity only exists. At temperatures that are exceptionally low. In order to use the materials, Extensive cooling systems are, therefore, essential. All the more astonished the scientists were when they arrived, a few years of high-temperature superconductors ago: with these substances, the effect already occurs at higher temperatures. Even if cooling is still necessary, it may be lower than with conventional superconductors. There are a number of uses for superconductivity. Trains to Magnetic from Maglev (Magnetic levitation) machines with resonance. But the manufacturing of a superconducting compound is still costly and costly, complicated. There are many innovations and a wide variety of the scope of research carried out in the field of it is still unclear, however, why superconductivity super conductivity starts at an unpredictably high stage. Temperature. Temperature if scientists come up with it someday, The secret could probably generate personalized materials, In which superconductivity also exists at normal levels, the effects of ambient temperatures on the technology is so profound, but it's not yet in technology vision.

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