

LEAI-71 Curie Temperature & Hysteresis Loop of Ferrite Materials

- Easy to use, simple structure, and stable performance
- Ample experimental examples
- 3 different samples



Magnetic materials have a wide range of applications. Magnetization curve and hysteresis loop reflect the magnetization characteristics of magnetic materials under the impact of external magnetic fields. Dynamic hysteresis loop is the AC magnetic characteristic of magnetic materials, which has important applications in the industry, because the core of AC motors and transformers works in AC state.

The magnetic properties of a ferromagnetic material change with the change of temperature. When the temperature rises to a certain value, the material will transit from ferromagnetic state to paramagnetic state. This temperature is called Curie temperature. Determining the curie temperature of ferromagnetic materials is not only of great significance to the research and development of magnetic materials and magnetic devices, but also to the applications of engineering technology.

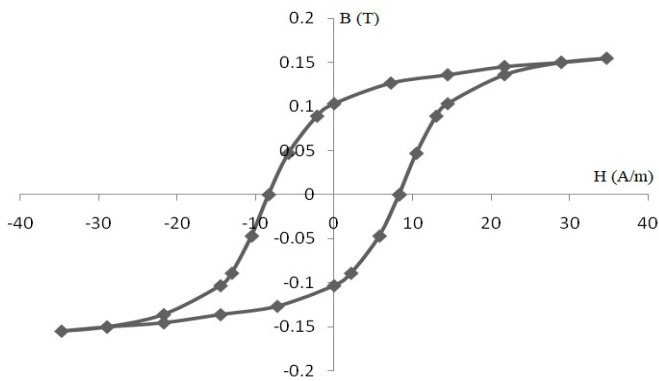
This experimental apparatus can not only measure the magnetic properties, but also observe the shape change of hysteresis loop caused by the change of magnetic moment with temperature variation, and measure the temperature when the spontaneous magnetization disappears (i.e. Curie temperature). The apparatus is simple in structure and stable and reliable in performance. Through the experiments of measuring Curie temperature and hysteresis loop of soft magnetic ferrite materials, students can deepen the understanding of the basic characteristics of magnetic materials.

Experimental Contents

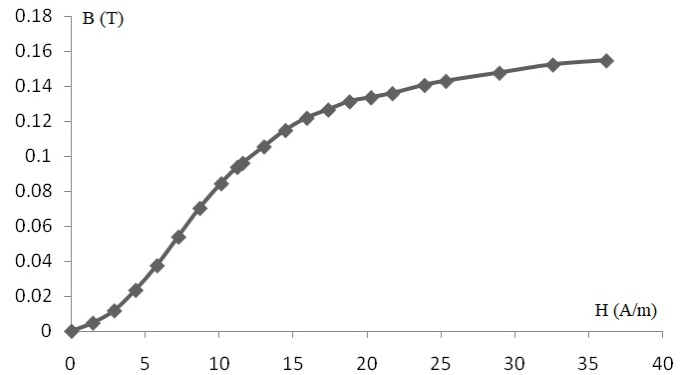
1. Measure the hysteresis loop of soft magnetic ferrite material; acquire the coercitive force and residual magnetism of the material;
2. Measure the basic magnetization curve of soft magnetic ferrite and the relationship curve between magnetic conductivity and magnetic field strength;
3. Measure the Curie temperature of the ferromagnetic material.

Parts & Specifications

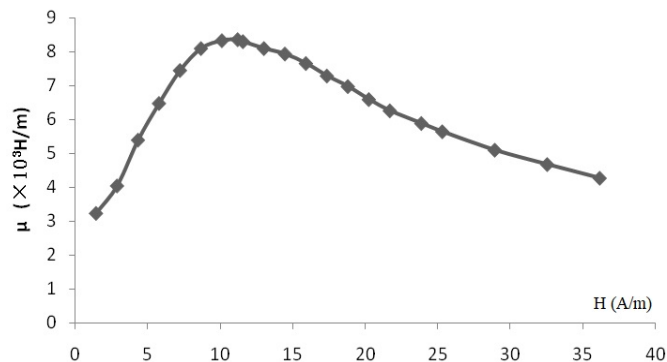
| Description | Specifications |
|---------------------------|--|
| Signal source | sine wave, frequency range: 7500 Hz ~9500 Hz adjustable; amplitude: 0 ~ 2.5 V (P-P) adjustable |
| AC voltmeter | range: 0 ~ 199.9 mV; resolution: 0.1 mV |
| Temperature control | room temperature ~ 80.0 °C; resolution: 0.1 °C |
| Ferromagnetic ring sample | 3 pcs with different Curie temperatures dimensions: inner diameter 2.8 mm, outer diameter 6.0 mm, height 4.0 mm. coil turns: both magnetization coil and secondary coil N=10 |



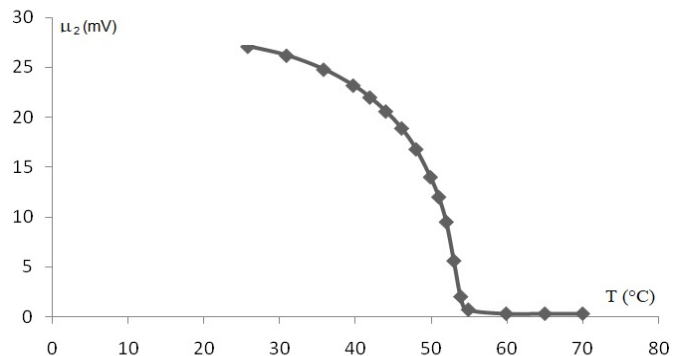
Hysteresis loop of sample B



Basic magnetization curve of sample B



Curve of magnetic conductivity & magnetic field strength



Temperature curve of sample B