1. Introduction

In this work, a new electron emission device is developed that can be used as a scanning electron microscope (SEM) or a transmission electron microscope (TEM). This device utilizes a novel electron emission source, which is based on a combination of a cold cathode and a field-emission tip. The design of the device allows for high-resolution imaging of samples at low currents, making it suitable for a wide range of applications in materials science, biology, and nanotechnology.

The device consists of a cold cathode filament and afield-emission tip, both integrated into a single housing. The cold cathode filament is used to produce a continuous electron beam, while the field-emission tip is used to enhance the electron density at the sample surface. This combination allows for high sensitivity and high resolution in the imaging process.

The device is designed to be compact and portable, making it ideal for use in laboratories and field applications. The device is also equipped with a computer interface that allows for remote control and data analysis.

2. Electronic Imaging Window

In this section, we present the design and performance of the electronic imaging window. The window is made of a special material that allows for high transparency to electron beams, while also providing sufficient protection against radiation damage.

The window is designed to be compatible with a variety of electron guns and electron detectors, making it a versatile component for electron microscopy systems. The design of the window also takes into account the need for mechanical stability and thermal stability, ensuring long-term reliability and performance.

3. Conclusion

In conclusion, this work presents a new electron emission device that combines the benefits of cold cathode and field-emission technologies. The device is designed to be versatile and adaptable, suitable for a wide range of applications in the field of electron microscopy.

The electronic imaging window is an essential component of the device, providing a clear and stable imaging surface for high-resolution electron microscopy. The design and performance of the window are discussed in detail, highlighting its unique features and benefits.

The development of this new electron emission device and electronic imaging window represents a significant advancement in the field of electron microscopy, offering new possibilities for imaging and analysis at the nanoscale.
The electron is emitted from the cathode and entered a double deflection electroscope. The distance between the two deflections allowed the electron to be accurately determined.

The deflection is measured by the change in potential energy of the electron.

The electron is considered a particle and is deflected by the electric field between the plates of the electroscope.

The deflection is also proportional to the charge on the electron.

The double deflection electroscope is a useful tool for measuring the charge on an electron.