

LEAI-62 Electron Diffraction Experimental Apparatus

- *Long lifetime electron diffraction tube*
- *Clear and sharp diffraction rings, high measurement accuracy*
- *Well isolated high-voltage and low-voltage by using a pulse-coupled transformer*
- *Reliable and affordable*



In the early 20th century, it was known that light has a property of wave-particle duality. In 1924, French physicist de Broglie presented a hypothesis that all micro particles have wave-particle duality. In 1927, American physicists Davisson and Germer conducted an electron reflection diffraction experiment with a crystalline nickel target. This experiment verified the de Broglie hypothesis and demonstrated the wave-particle duality of electrons. Later, a similar experiment was conducted by British physicist Thomson by letting electrons pass through a crystalline film to measure the de Broglie wavelength. Now, electron diffraction approach has become an advanced technology to study solid thin film and the surface layer of a crystal structure.

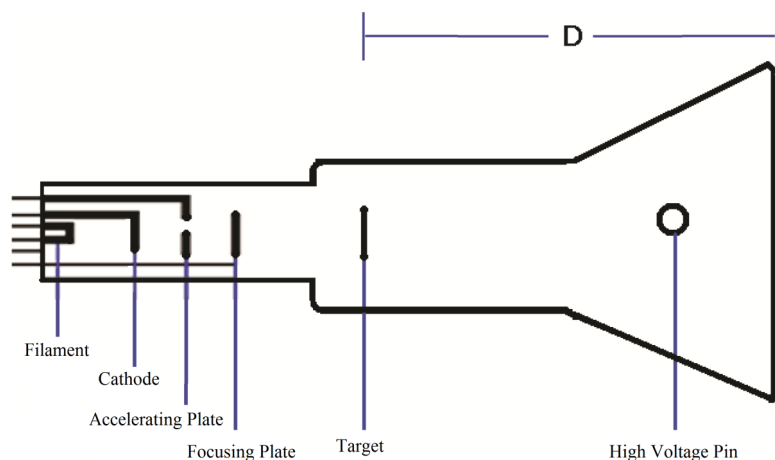
This LEAI-62 electron diffraction apparatus is equipped with a specially designed diffraction tube, whose structure can be observed through a transparent window on the side panel of the apparatus. The electron gun is designed to withstand high voltage with long lifetime. The polycrystalline gold foil target is placed between the electron gun and the screen. Electron beam is accelerated by a high voltage of less than 20 kV to bombard the thin metallic target and hence a diffraction phenomenon is generated. The diffraction pattern is very bright and clear on the screen, enabling quantitative measurements.

Experimental Contents

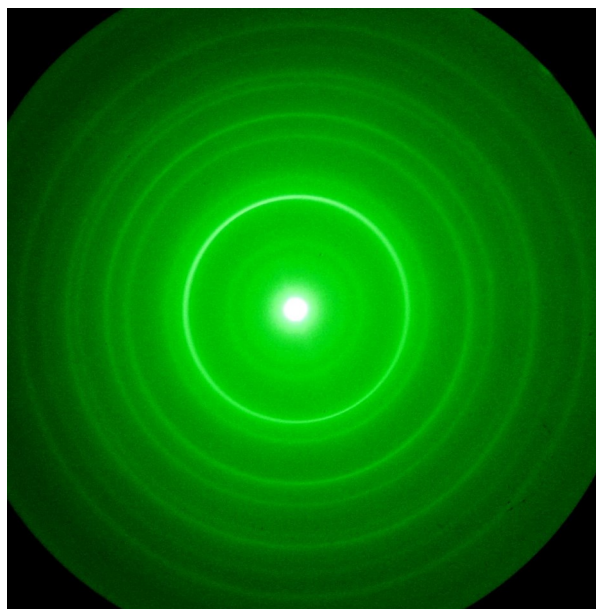
1. Acquire the wavelength of a moving electron, and verify the de Broglie equation.
2. Measure the lattice constant of gold crystalline material.
3. Measure the Miller indices of corresponding diffraction rings.
4. Calculate the Planck's constant.

Specifications

DC high voltage	0 ~ 20 kV adjustable, current 0.8 mA
Filament voltage	6.5 V
Screen diameter of diffraction tube	130 mm
Diffraction target	polycrystalline gold foil, diameter 15 mm
Dimensions	360 mm × 200 mm × 520 mm



Schematic of electron diffraction tube



Note: above product information is subject to change without notice.