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Electron Diffraction Experimental Apparatus

EDEA-3079

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Analytical Technologies Limited

An ISO 9001 Certified Company

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Characteristics

- 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 elec-tron 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.

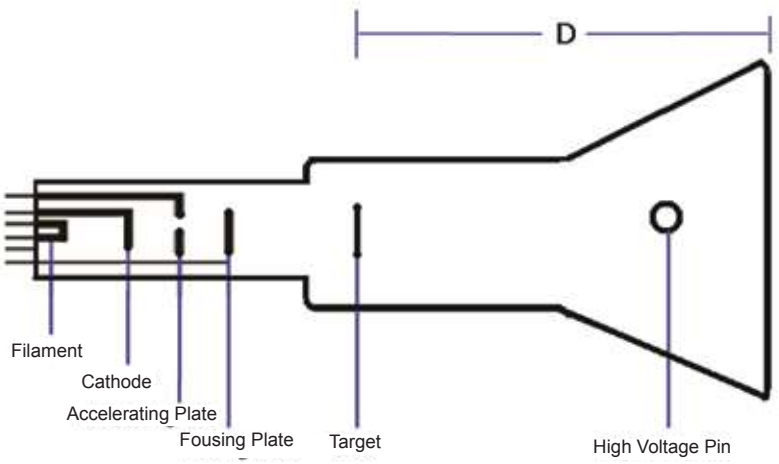
This LEAI-62 electron diffraction apparatus is equipped with a spe-cially designed diffraction tube, whose structure can be observed through a transparent window on the side panel of the apparatus. The electron gun is designed to withstand high voltage with long lifetime. The polycrystalline gold foil 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 dif-fraction phenomenon is generated. The diffraction pattern is very bright and clear on the screen, enabling quantitative measurements.

Experimental Contents

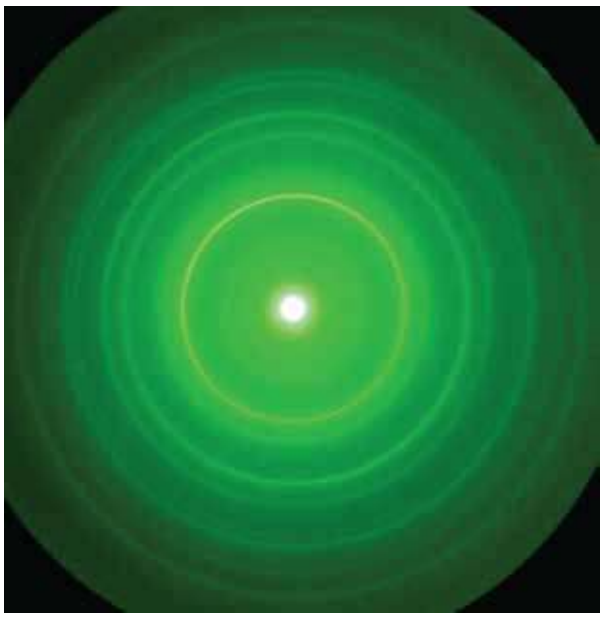
1. Acquire the wavelength of a moving electron, and verify the de Broglie equation.
2. Measure the lattice constant of gold crystalline material.
3. Measure the Miller indices of corresponding diffraction rings.
4. Calculate the Planck's constant.

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



Diffraction pattern

Regulatory compliances

Corporate Social Responsibility

Analytical Foundation is a Nonprofit Organization (NGO) found for the purpose of:

1.Research & Innovation Scientist's awards / QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personallities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops / Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds, souls and body by means of Yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

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Analytical® Technologies Limited

HPLC Solutions | MultipleLabs | Analytical Bio-Med | Analytical Distributors | Analytical Foundation (Trust)

Corporate & Regd. Office:
Analytical House, # E67 & E68,
Ravi Park, Vasna Road, Baroda,
Gujarat 390 015. INDIA

T: +91 265 2253620
+91 265 2252839
+91 265 2252370
F: +91 265 2254395

E: info@hplctechnologies.com
info@multiplelabs.com
info@analyticalgroup.net
info@analyticalbiomed.com

W. www.ais-india.com
www.analycalgroup.net
www.hplctechnologies.com
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