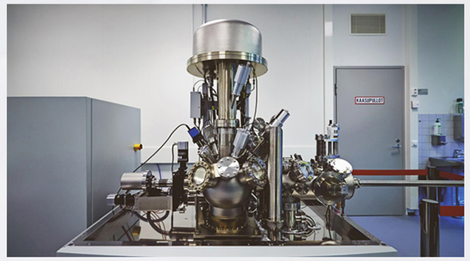
X-RAY



1. X-ray Source:
   - X-ray devices typically feature an X-ray tube as the source of X-rays. Inside the tube, electrons are accelerated to high speeds and then suddenly decelerated or stopped, producing X-rays.
   - This process occurs through interactions between electrons and a target material, usually a heavy metal like tungsten.
2. X-ray Beam Formation:
   - The X-ray tube emits a broad spectrum of X-rays, which are then filtered to select the desired energy range for a particular application.
   - Collimators and other components shape and direct the X-ray beam towards the target of interest.
3. Interaction with Sample:
   - The X-ray beam interacts with the sample being studied. The sample may absorb or scatter X-rays depending on its composition and structure.

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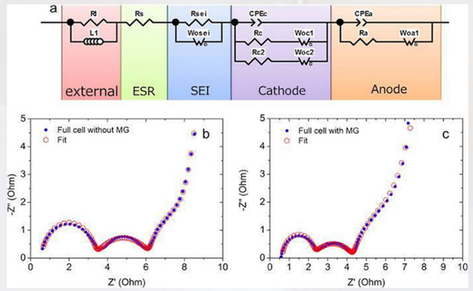
EIS



In analytical chemistry: EIS stands for Electrochemical Impedance Spectroscopy. It's a powerful technique used to study the electrochemical properties of materials, surfaces, and interfaces. EIS measures the impedance response of a system to an applied sinusoidal voltage over a range of frequencies, providing valuable information about processes like corrosion, adsorption, and reactions occurring at the electrode interface.

1. Principle: EIS works by applying a small amplitude AC voltage across an electrochemical cell and measuring the resulting current response. By varying the frequency of the applied voltage over a wide range, EIS can probe different electrochemical processes occurring at the interface.
2. Components: The basic setup includes a potentiostat / galvanostat to apply the voltage and control the current, a frequency response analyzer to measure the impedance, and electrodes immersed in an electrolyte solution.

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TEM

What is a TEM?

Transmission electron microscopy TEM is a microscopy technique in which a beam of electrons is transmitted through a specimen to form an image.

TEM is the original form of electron microscope uses :

- A heigh voltage electron be to create an two dimensional (2D)image .
- These electrons are emmited by an election gun accelerated by an anode and focused by electromagnetic lenses .
- And finally transmitted through the specimen.
- When it emerges from the specimen,the electron beam carries information about the internal structures of the specimen .
- Fixed dehydrated specimen are embedded in resin,stained with heavy metals such as uranium and lead.and inserted into the electron column in microscope .

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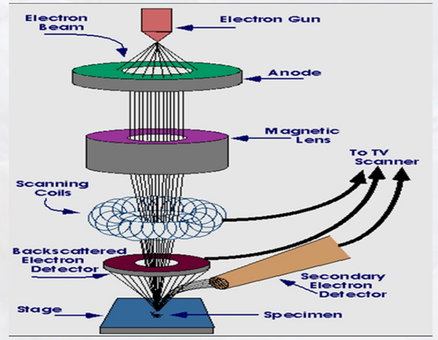
SEM



What is SEM?

Scanning electron microscopy or, SEM, is advanced electron microscope that uses a focused beam of electrons to scan the surface of a simple. This technique differ from traditional microscopy by using electrons instead of light,enabling much higher resolutions.

The SEM is an instrument that produces :

- A largely Magnified image by using electrons instead of light to Form an image.
- A beam of electrons is produced at the Top of the microscope by an electron gun.
- The electron Beam follows a vertical path through the microscope, Which is held within a vacuum.

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