

Electron microscopy/construction

This article was checked by pedagogue

This article was checked by pedagogue, but later was changed.



Checked version of the article can be found here (https://www.wikilectures.eu/index.php?title=Electron_microscopy/construction&oldid=18562).

See also comparison of actual and checked version (https://www.wikilectures.eu/index.php?title=Electron_microscopy/construction&diff=-&oldid=18562).

HOW ABOUT A DIAGRAM???



The first commercially available electron microscope was built in England by Metropolitan Vickers for Imperial College, London, and was called the EM1.

TEM construction

is necessary:

1. **Electron gun**- with Metallic filament cathode to emit electrons that move toward an anode; Metallic plate with a central hole that forms a beam of electrons passing through it

2. Column

- Lenses- The 1st lens is a condenser focusing the beam of electrons on a section of the specimen.
- Other lens: objective lens ; intermediate lens; projector lens; (that magnify the image)
- Detectors - Electron detector with CCD camera
- vacuum unit – electron microscopy require a vacuum to operate. Without a vacuum, the electron beam generated by the electron gun would encounter constant interference from air particles in the atmosphere.
- high-voltage supply

SEM construction

Is necessary:

1. **Electron gun** – with Metallic filament cathode to emit electrons that move toward an anode

2. Column

- Lenses: SEMs use lenses to produce clear and detailed images. The lenses in these devices, however, work differently. The lenses are made of magnets capable of bending the path of electrons. The lenses focus and control the electron beam, ensuring that the electrons end up precisely where they need to go.
- Scanner – where the electron beam is scanned
- Sample chamber: Is where researchers place the specimen that they are examining. Because the specimen must be kept extremely still for the microscope to produce clear images, the sample chamber must be very sturdy and insulated from vibration.
- Detectors: These devices detect the various ways that the electron beam interacts with the sample object.
- Vacuum chamber: SEMs require a vacuum to operate. Without a vacuum, the electron beam generated by the electron gun would encounter constant interference from air particles in the atmosphere

references: Junqueira's Basic Histology, Anthony L. Mescher