技術情報 Technical Information

AES　Neutralizing Gun (FMIED)

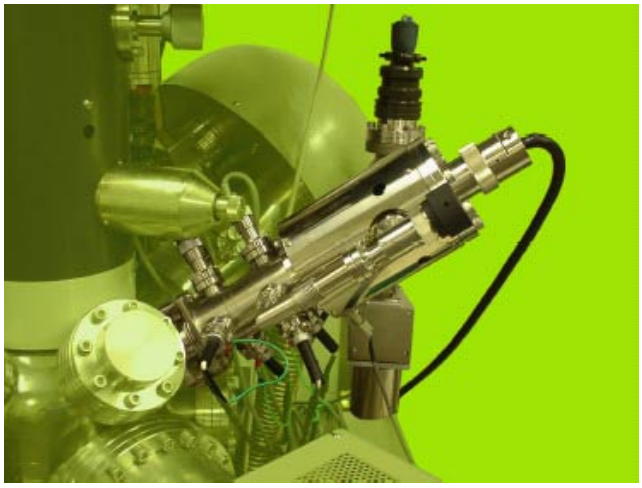
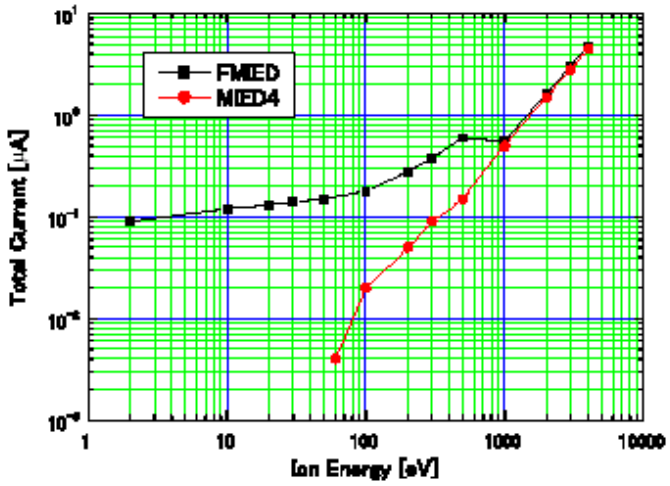


Figure:　Floating micro ion etching device

- Official name:　Micro ion etching device
- Description:　Ion gun to be mounted to Auger microprobe for etching and charge neutralization

Specifications

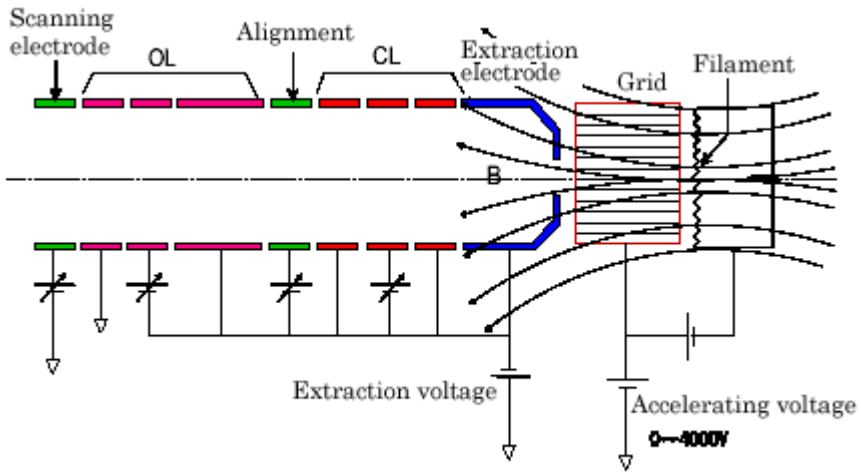
1. Ionization method:　Electron bombardment
2. Excited ions:　Inert gases such as Ar
3. Ion extraction:　By ground or floating electrode
4. Floating voltage:　Maximum –500 V
5. Ion energy:　0 to 4,000 eV
6. Lens system:　Condenser and objective lenses (single stage each)
7. Minimum ion beam size (FWHM):　200 μm or less
8. Ion beam scan width:　3 mm on sample surface
9. Applicable models:　JAMP-7830F, JAMP-7810, JAMP-7800F, JAMP-7800



Current characteristics of floating ion gun (FMIED) and conventional ion gun (MIED4)

- Low energy ion irradiation at 50 eV neutralizes the sample surface without sputtering.
- A single ion gun can both sputter and neutralize samples.
- Ion gun control being fully digitized, it is easy to set up and edit operating conditions.
- The control system automatically switches the mode between sputtering and neutralizing, supporting combinations of functions; e.g., neutralizing during depth

[Principles of floating micro ion etching device]



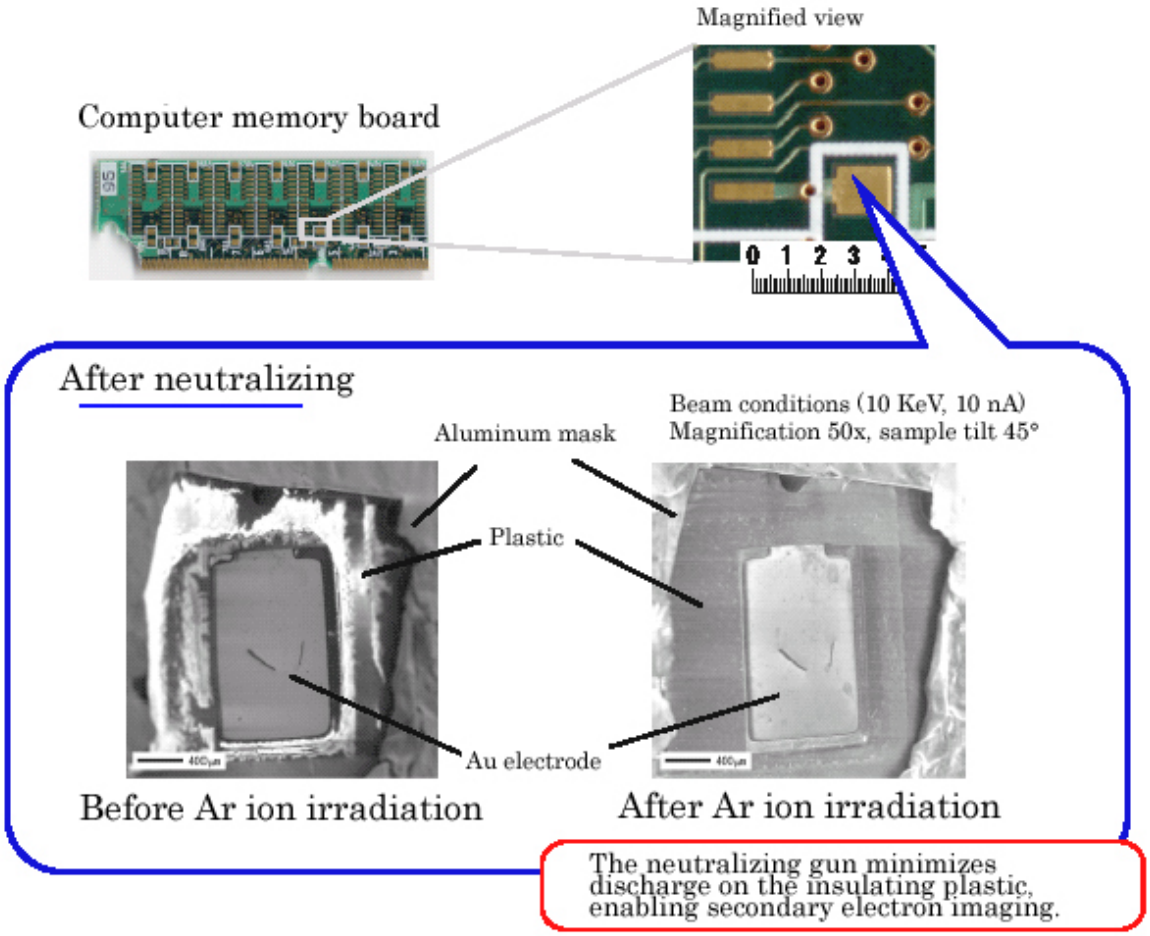
- The filament produces thermal electrons, which are bombarded with Ar in the grid, resulting in

Ar ions.

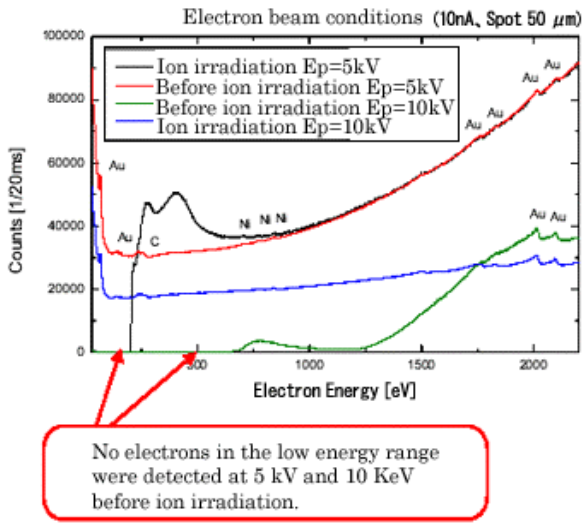
- Ar ions are introduced to the lens system by the difference in potential between the extraction electrode and grid.
- The CL and alignment control the potential using the voltage of the extraction electrode as a reference, maintaining the kinetic energy of the ions.
- The OL has ground potential at the tip, simultaneously focusing and decelerating the Ar ions.
- The resulting Ar ions, having the potential equal to the grid's, are projected onto the beam.

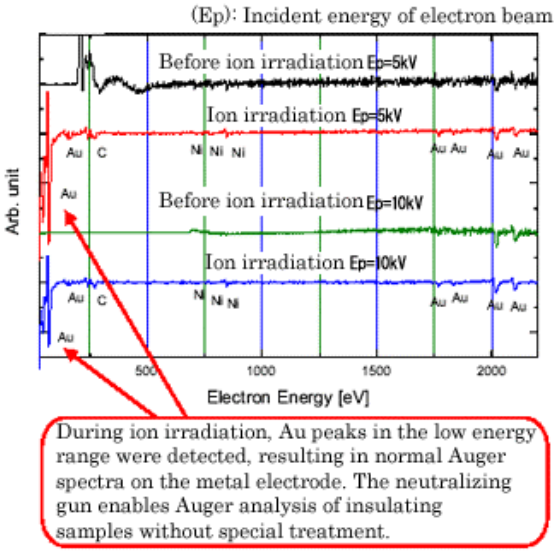
Analysis of metal electrode on printed circuit board

Changes in secondary electron images



Changes in Auger spectra (Ar ion: 10 eV; 0.1 uA probe)





No electrons in the low energy range were detected at 5 kV and 10 KeV before ion irradiation.

During ion irradiation, Au peaks in the low energy range were detected, resulting in normal Auger spectra on the metal electrode. The neutralizing gun enables Auger analysis of insulating samples without special treatment.