



HITACHI SU70 SCANNING ELECTRON MICROSCOPE

SEM Description

The Hitachi model SU70 scanning electron microscope (SEM) is used for imaging, elemental analysis and the fabrication of nanostructures by both electron beam lithography (EBL), and direct write electron beam induced deposition (EBID). The SEM uses an electron optical system consisting of a series of electromagnets to focus and scan a beam of electrons over the area to be imaged. Because the SEM illuminates the specimen using electrons it can achieve magnification greater than 1000 times that of a light microscope.

Electron Beam Nano-fabrication

Electron Beam Lithography (EBL) and Electron Beam Induced Deposition (EBID) are used to fabricate nanoscale devices. EBL is a resist based Lithography similar to optical lithography. Pattern designs are scanned onto the resist using the electron beam of the SEM. The resist is then developed leaving behind a copy of the pattern. EBID is a direct write lithography which uses a Gas Injection System (GIS) to deposit nanostructures by Chemical Vapor Deposition (CVD). The electron beam induces deposition of the injected gas on the substrate directly, avoiding the need for a mask. Both etching and deposition can be performed depending on the gas used.



Specifications:

- 1 nm Resolution 15kv at 4mm working distance
- 800,000x magnification
- Thermal field emission source
- Remote Control Capability
- 3D Rendering and Metrology

Attachments:

- NPGS Electron Lithography System
- Omniprobe gas injections system (GIS)
- IXRF SDD EDS system
- Electron Beam Induced Current (EBIC)
- Scanning Transmission Electron Microscopy detector (STEM)

USF College of Engineering
4202 East Fowler Avenue NTA102
Tampa, Florida 33620-5350

Contact: Jay Bieber
Cell: 813.760.3941
Fax: 813.974.3610
<http://www.nrec.usf.edu>