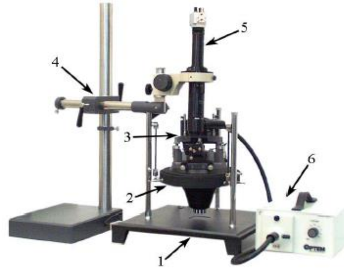
Measurement of: Surface morphology and topography of the thin film

Equipment: Atomic Force Microscopy (NT -MDT SolverP47-Pro)

Property Measured: Surface morphology and Roughness analysis

Photograph (small size)



Basic Principle:

It is based on the interaction of a very sharp cantilever tip over a sample surface. As the tip approaches the surface, The attractive force between the surface and the tip causes the cantilever to deflect towards the surface. However, as the cantilever is brought even closer to the surface, such that the tip makes contact with it, increasing repulsive forces takes over and causes the cantilever to deflect away from the surface. As a result the raised and lowered features on the sample surface influence deflection of cantilever so by using a feedback loop to control the height of the tip above the surface can generate the topographic map of the surface.

Capabilities:

(i) Available modes: Contact AFM, Semi contact mode and Kelvin probe force microscopy
(ii) Replaceable scanner: X,Y,Z 10x10x2µm(+/-10%)
(iii)Sample base which includes
- Sample-to-tip automatic approach system
- Adjustable viewing mirror,
- Scanner connector
- Bias voltage and heating stage connectors
- Manual X,Y positioning stage
- Range of sample positioning 5x5 mm
- Positioning resolution 5µm

(iv) Vibration and acoustic isolation systems
- Vibration isolation system
- Protective cover for electric shielding and acoustic isolation

(v) Electronics
- SPM controller

Sample Requirement: 1cmx1cm thin film substrate