

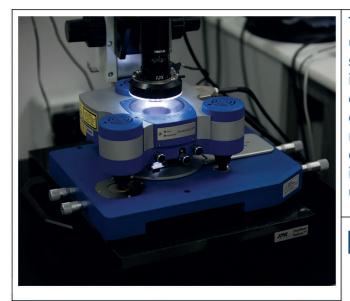






Ewrop & Chymru: Buddsoddi yn eich dyfodo Cronfa Datblygu Rhanbarthol Ewrop Europe & Wales: Investing in your future

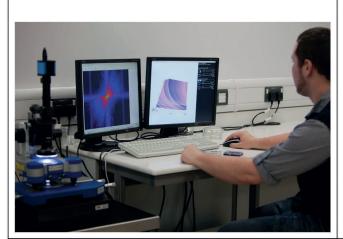
ATOMIC FORCE MICROSCOPE



The JPK Nanowizard Atomic Force Microscope utilises the physical interaction of a probe tip with a surface to image topography in 3-D. When the tip is moved across the surface in a raster scan the change in height is detected and this is displayed as the image. AFM can give very precise measurements of small surface features, roughness and adhesion forces. AFM is also capable of imaging soft biological and insulating samples unlike other microscopy techniques.

SPECIFICATIONS

- Electrical conductivity and I-V measurements on the nanoscale
- Liquid cell for imaging and force measurements in a liquid environment.
- 100x100x15um³ scan range for the head in closed-loop Mode.
- Pixel resolution:>131,000 pixels for force curves.

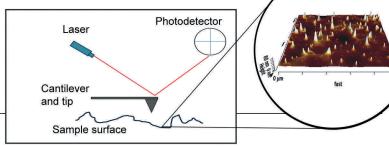


FEATURES

- Force measurements
- Phase Imaging
- Electrical mode for surface potential and electronic properties
- Conductive-AFM
- Kelvin Probe Microscopy (KPM)
- Scanning Tunnelling Microscopy (STM)

BENEFITS

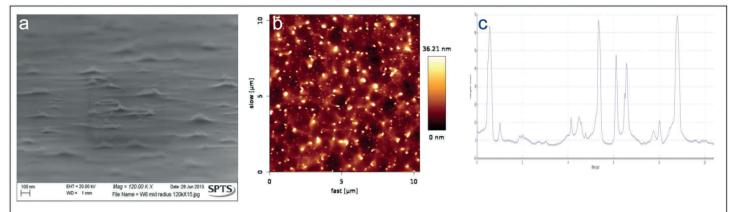
- Optimise a process by identifying key changes in a material.
- Exact characterisation of a materials shape and size.
- Can be used to perform quantitative analysis such as measuring the surface electric charge or the adhesion force between the probe material and the surface.
- Reduce costs and improve product performance.
- Ability to visualise a surface on the nanometre scale.





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CASE STUDY



Figures: (a) SEM image of an etched surface (b) topographic image of the surface using AFM (C) cross section AFM linescan showing peaks on the Si surface

SPTS contracted the centre to verify data taken from existing analytical techniques at their laboratory with AFM measurements. Samples were measured and a comprehensive analysis report was then provided. The surface of the etched Si was imaged using SEM and compared to the AFM images. The AFM technique at the Centre for NanoHealth also allowed accurate measurement of the surface roughness which was validated by SPTS using white light interferometry

APPLICATIONS

AREA OF INTEREST	APPLICATIONS
Nanoscience, Polymers & Thin Films	 Biomaterial studies and biosensor capsules. Implants coatings and biochips. Testing functionalized surface. Soft materials studies such as degration, mechanical or electrical properties. Polymers and thin film imaging and mapping in air and liquid with different. temperatures of liquids such as non aqueous solvents. Nanoparticles, nanotubes, nanocomposites, vesicles and colloids investigation.
Characterisation with AFM	 Measurement of surface topography Quantitative analysis of surface roughness Measurement of surface charge