

**DFM**

Danish National Metrology Institute

ABOUT DFM

DFM is Denmark's National Metrology Institute (NMI). DFM is a signatory to the CIPM-MRA arrangement that ensures mutual recognition of measurements worldwide

TRACEABILITY

All measurements are traceable to recognised national and international standard.

ISO CERTIFICATION

All services are covered by DFM's ISO 9001 certification

CONTACT DFM

DFM A/S

Kogle Alle 5

DK-2970 Hørsholm

Denmark

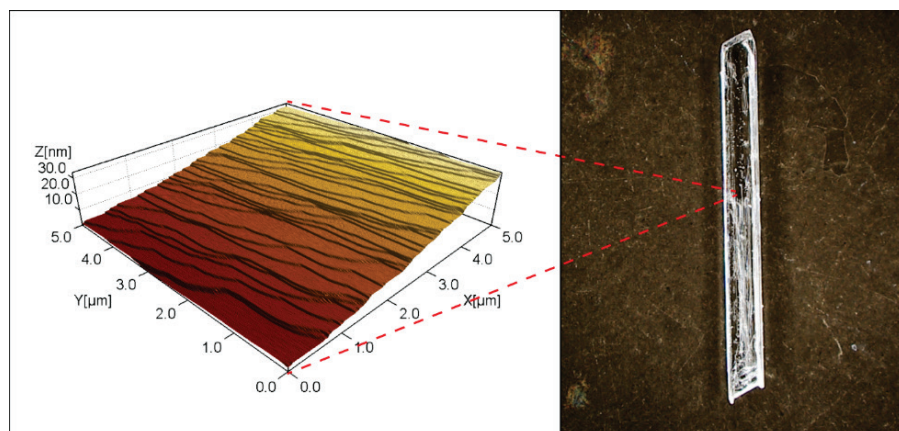
www.dfm.dk

administration@dfm.dk

Tlf.: +45 7730 5800

Microcrystal measurements

Characterizing structural stability of micro surfaces under environmental conditions



Applications

Stability of micro chemical components such as crystals is critical for their functionality in products. Chemicals have to survive storage and transportation before they are put into use at the point of application. Investigation of the stability of chemicals under different environmental conditions is sometimes hindered by the limited amount of available samples, particularly during the early screening process of product development.

Harnessing the power of Atomic Force Microscopy (AFM), DFM has now made it possible to study structural stability of chemical components in tiny amounts. Enabled by the ultra-high resolution of AFM, structural changes in response to environmental conditions, like temperature and humidity, can be monitored and measured with nanometer accuracy.



CONSULTANCY SERVICES

Do you need new measurement capabilities, does a method call for a bit of scrutiny, or are you perhaps seeking to acquire new equipment? Take advantage of the consultancy services we provide in addition to our calibration services.

As an independent institute deeply rooted within research and metrology, DFM has gained the reputation of being an agile, solid, and valuable partner. Contact us and find out why.

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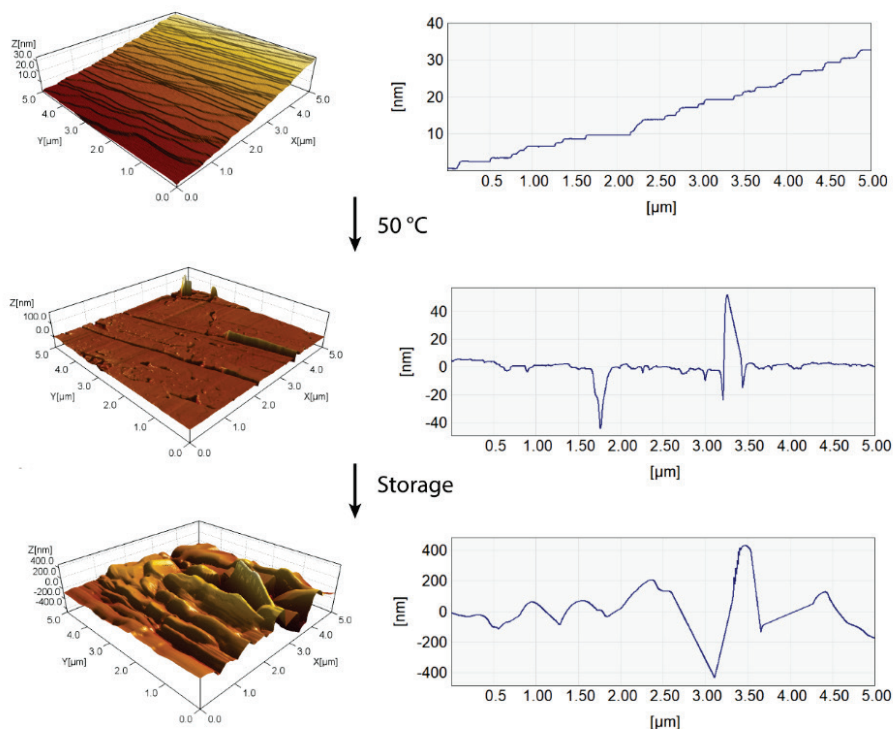
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Services and specifications

- K07.211 AFM measurement of structural surface stability, acc. to quotation

Surface structures will be measured by AFM under environmental control. Changes over time can be followed, both *ex situ* and *in situ*. The temperature and humidity can be changed, either independently or combined.

- Maximum image range: 100×100 μm^2
- Maximum height: 13 μm
- Resolution: 0.1 nm for Z and 1 nm for X and Y (sample dependent)
- Medium: Air
- Temperature range: 4 - 180 °C in air
- Humidity range: RH 11% - 85%
- Sample requirement: micrograms and above (contact DFM for details)



The example shows how AFM monitored the surface structures of a crystal hydrate. At first, the crystal in the upper figure was dehydrated due to exposure to raised temperature. Then, the crystal was rehydrated over time during storage at ambient conditions.

Examples of related services

The microcrystal service complement our existing test and measurement services within micro and nanotechnology, such as

- K07.001 AFM calibration of two-dimensional gratings *)
- K07.003 AFM calibration of step heights *)
- K07.210 AFM measurements of surface adhesion, acc. to quotation
- K07.999 AFM surface measurement, according to quotation

*) Under DANAK accreditation