

SPECS Systems

SPECTROSCOPY AND MICROSCOPY UNDER
NEAR AMBIENT PRESSURE CONDITIONS

NAP-XPS & NAP-SPM

„In order to understand real world chemical processes, we need to analyze them as they occur in the real world.“

Miquel Salmeron, Berkeley Lab



SPECS™

SPECS leads the way for state-of-the-art technology, cutting-edge components and individually designed complex systems for surface analysis.

SPECS Surface Nano Analysis GmbH

SPECS has more than 150 employees at its headquarters in Berlin and its subsidiaries in the USA and Switzerland. The company also has sales offices in Spain and international sales channels in sixteen countries. A team of scientists and engineers are involved in developing and producing scientific instruments for surface analysis, material science and nanotechnology. Since the company was founded in 1983, they have based their success on a continuous growth in experience. SPECS scientists are in close contact with a large number of customers and scientists around the world. SPECS is your essential partner due to our focus on customer support, know-how and their international contacts. Scientists all over the world can rely on SPECS product quality and be inspired by the continuous program of new product development.

Packaging of a SPECS component after final testing



SPECS specialist assembles a high voltage 2D-CCD Detector to a PHOIBOS 150 HV



With the SPM 150 Aarhus (STM & NC-AFM), SPECS offers an instrument of unique stability and productivity for surface studies with atomic resolution. Atomic growth and catalytic processes on surfaces can be equally observed at different temperatures. A second example for a state-of-the-art surface microscope is the Low Energy Electron Microscope LEEM P90, developed in cooperation with Dr. R. Tromp (IBM), which allows in-situ studies of surface dynamical processes, for instance the growth of surface structures.

Those instruments are only two examples from the variety of SPECS products which are continuously widening or revolutionizing the field of applications. See www.specs.com or contact SPECS Surface Nano Analysis GmbH directly for further information.

PHOIBOS 150 NAP

The PHOIBOS 150 NAP Analyzer is a true 180° hemispherical energy analyzer with 150 mm mean radius. For ultimate performance, the analyzer and lens system are constructed entirely from non-magnetic materials inside the μ -metal shielding.



For analysis in pressures up to 25 mbar the lens system is a crucial part of the NAP electron spectrometer design. The first aperture (nozzle) has a diameter of down to 0.3 mm, separating the wide-angle lens from the sample environment. Together with the standard PHOIBOS lens it forms a three stage differential pumping system.

DeviSim NAP



DeviSim NAP is a small reactor cell of 400 ml volume at NAP conditions that can directly be coupled to the PHOIBOS 150 NAP. It includes all gas management and the sample heater.

STM Aarhus 150 NAP



The investigation of catalytic reactions on surfaces and the attempt to bridge the pressure and material gap between UHV and “real world” applications requires an ultra-stable and reliable SPM able to operate in extreme conditions. Once again, the stability and smart simplicity of the SPM Aarhus design allows for the extension of the applications in the pressure range between UHV and 100 mbar with a special near ambient pressure (NAP) design. For this, the SPM Aarhus head is mounted inside an in-situ reactor cell made of inert materials. By doing so, only the inside of a small reactor cell is flooded with the gas. Easy and fast switching between UHV and near ambient pressure applications is possible by opening a lid on top of the reactor cell. A halogen lamp heater for high temperature applications is integrated directly in the lid allowing imaging of all kinds of samples at temperatures up to 850K in UHV and 550 K at 10 mbar.

“In-situ” tip/sensor preparation by ion sputtering is still feasible when the lid of the reactor is open. A direct “in-situ” optical access to the sample during measurements at near ambient pressures can be used for investigation of photo catalytic reactions. Both STM tips as well as the KolibriSensor™ can be used with the system without any compromises on its stability.

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