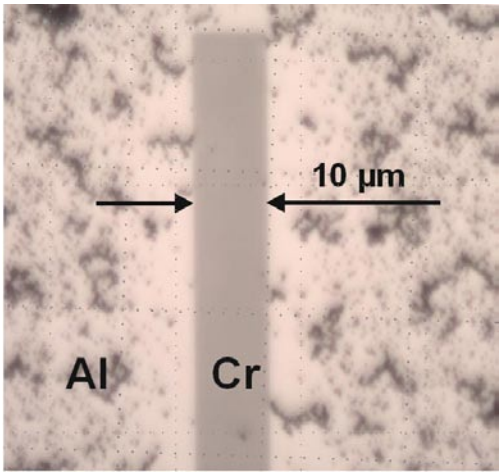
PTB innovations
Technology Offer



Artifact with zero-topography material contrast (aluminum and chromium)

Fabrication Process for Zero-Topography Resolution Standards

To determine the chemical nature of surfaces, different analytical procedures are used which allow element-specific statements to be made with regard to the composition. In order to calibrate their resolution, appropriate two-dimensional artifacts are required which are made of adapted 2D structures composed of several materials that are specially defined for application in measurements. For this purpose, PTB has developed a novel fabrication procedure which allows these zero-topography artifacts to be manufactured in several steps.

The reference material consists of a silicon wafer on which structures composed of different materials are deposited. The surface should, as far as possible, exhibit zero topography, i.e. the structures should show no pitch at the transitions where disturbing effects might occur due to electrons that are scattered at the edges. A smart combination when depositing the various material partners and removing the corresponding wafer or other carrier substrates provides a nearly zero-topography reference surface of the highest precision.

Advantages

- **Lateral calibration of IXPS instruments possible for the first time**
- **Investigation of the influence of materials (e.g. van der Waals forces) with the atomic force microscope (AFM)**
- **Technology can be extended to other combinations of materials**
- **Technology can be adapted down to the micro/nanoscale**
- **Mass production possible**

Economic Significance

This procedure had originally been developed for X-ray photoelectron spectroscopy (XPS). Further applications for structured, flat artifacts are Auger electron spectroscopy, hardness measurement and scanning force microscopy.

Development status

The first artifacts were developed within the scope of the European joint research project *SurfChem*.

Licenses for the utilization of this new method are available.

Contact:

Dr. Bernhard Smandek
Technologietransfer
Telefon: +49 (0)531 592-8303
Telefax: +49 (0)531 592-69-8303
E-Mail: bernhard.smandek@ptb.de

Dr. Sebastian Bütefisch
Scanning Probe Metrology Working Group
Phone: +49 (0)531 592-5119
E-mail: sebastian.buetefisch@ptb.de

Physikalisch-Technische Bundesanstalt
Bundesallee 100
D-38116 Braunschweig

www.technologietransfer.ptb.de

#0385 / 02.2016