

## NANOINDENTATION OF NANOSIZED FILMS

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Further progress in the field of creating functional and multifunctional nanostructured materials and coatings is associated, both with the development of industrial technologies for their production and with the certification of methods for measuring the mechanical properties of nanomaterials. Determination of mechanical properties plays a primary role in the design of new nanomaterials, making it possible to predict possible mechanisms of their destruction, controlled by the structural state of the surface layers. In this work, using a micro-nano modifier "Micro-nano mod", the surface morphology of nanosized films of gold and indium was studied, and the methodological features of their nanoindentation were shown. Analysis of the morphology of the surface of nanosized films on glass obtained by magnetron sputtering demonstrates the presence of a pronounced island structure with dimensions of 70- 400 nm for indium film and 50-200 nm for the gold film. It was found that for nanoindentation of indium nanofilms on glass it is necessary to apply an indentation load of not more than 0.9 cN. Latter will allow correctly determining the size of the impression and standardizing the determination of the actual hardness of indium nanofilms on glass. It is shown that when indenting the gold nanofilm with a load of 1.5 cN, the shape of the Berkovich indenter impression is not triangular. The fundamental possibility of creating nano-objects as the nanotracks-wires by means of the tunnel current on the surface of indium nanofilm is shown.

### Topics

Session A. Physics of condensed matter and spectroscopy

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