

Who we are

For a long time the main task of the laboratory was to study the superhard mono- and polycrystalline materials, as well as diagnostics of tool from polycrystalline superhard materials. The CVD technology of diamond-like amorphous carbon antireflective coatings are developed in the laboratory. The SEM, EDS, ellipsometry and UV-vis.-IR spectroscopy are used in material science analysis. We also use Spectral mapping, IR and optical microscopy, Cathode luminescence, Electron backscatter diffraction (EBSD), also known as backscatter Kikuchi diffraction (BKD) to study the properties of different materials.

Collaboration interests

Nanostructural and Crystal Physics Research Laboratory is interested in participating in EU projects under FP7 and HORIZON 2020 program and also in other forms of international projects in the following research areas: materials science and HPHT physics and nondestructive testing.

We are able to produce diamond-like amorphous carbon antireflective coatings, study material properties and products by wide range nondestructive testing methods.

Potential role: joint research, scientific expert, technology provider.

Research Areas

Synthesis of new superhard and functional materials.

Study of high pressure phase transformations, construction of phase diagrams of multicomponent systems at high pressure and temperature.

High pressure sintering of superhard polycrystalline and composite materials on the basis of diamond and cubic boron nitride.

Main achievements

High resolution electron backscattered diffraction (EBSD) has been used for analysis of grain size, texture and stress distribution on growth side of free-standing polycrystalline diamond films of different grade. Evolution of texture (columnar growth) and stress distribution with film thickness has been observed with EBSD study of film cross-sections.

Reference projects

STCU project 1356 “The Interference Coats for Optical Elements and Film Forming Materials on the Base of the Carbon and the Rare-Earth Metals Compounds”.

Bilateral project Ukraine – Belorussia.

Contact information

Full name of the Research Department:
 Nanostructural and Crystal Physics
 Research Laboratory

Full name of the Institute:
 V.N. Bakul Institute for Superhard
 Materials of the National Academy of
 Sciences of Ukraine

Country: Ukraine

Number of employees working in the
 research division: 12

Working languages: English, Russian,
 Ukrainian

Contact person: Dr. V. Tkach

Position: Head of the Laboratory

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Well-qualified researchers: 1 Dr. Sci.,
 6 Ph.D., 4 M.Sc.

Well-qualified workforces to operate
 with analytical and technological
 facilities, PVD and CVD equipment.

Wide experience on the materials
 science and HPHT physics research
 areas.

We have experience of co-operation
 with partners from Hong Kong,
 Russian, Poland and Belarussian.

What makes
 us a good
 partner

