



International Meeting

CLUSTERS AND NANOSTRUCTURED MATERIALS (CNM'5)

PROGRAM and MATERIALS



Uzhgorod Ukraine
22 – 26 October, 2018

National Academy of Sciences of Ukraine
Institute of Physics
G.V.Kurdyumov Institute for Metal Physics
Institute for Information Recording
Uzhgorod laboratory of optoelectronics and photonics materials of the
Institute for Information Recording
Uzhgorod National University

INTERNATIONAL MEETING

**CLUSTERS AND NANOSTRUCTURED
MATERIALS
(CNM-5)**

**Uzhgorod *Vodograj* Ukraine,
22-26 October 2018**

**PROGRAM & MATERIALS
OF THE MEETING**

**Uzhgorod
2018**



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The materials represent the contents of meeting's reports based on the results of fundamental and applied works on topical questions in the field of nanostructured systems, nanomaterials and nanotechnologies. Main attention is given to the consideration of problems of nanophysics and nanoelectronics, to atomic and electronic structure of cluster and nanostructured materials, amorphous alloys, nanostructured films and coatings, colloidal and biofunctional materials, to study of their properties. The results of investigations in the field of supramolecular chemistry, synthesis of nanoparticles, nanostructures and multifunctional nanomaterials, physico-chemistry of superficial phenomena and diagnostics of nanosystems are presented.

The edition is designed for scientists, engineers, higher school lecturers, post-graduates and students of corresponding specialities.

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PROGRAM



MONDAY, 22TH OF OCTOBER, 2018

8⁰⁰ – 13⁰⁰ – registration of CNM'5 participants, coffee-break

13⁰⁰ – 14⁰⁰ – lunch

15⁰⁰– 15³⁰ – Opening MEETING (official speakers)

PLENARY

Chairman: **Studenjak I.**

15³⁰ – 16²⁰ – **NANODIMENSIONAL SYSTEMS: INVESTIGATIONS FND
DEVELOPMENT IN THE NATIONAL AKADEMY OF SCIENCE OF
UKRAINE**

Uvarov V.M., Malchevskii I.A., Bespalov S.A.

16²⁰ – 17¹⁰ – **USING A DIRECT LASER RECORD TO CREATE SUB-MICRON
STRUCTURES**

Petrov V.V., Kryuchyn A.A., Shanoylo S.M., Beliak Ie.V., Manko D.Yu.,
Gorbov I.V. .

17¹⁰ – 18⁰⁰ – **FERROELECTRIC NANO-STRUCTURES FOR ULTRAFAST THZ
COMMUNICATIONS, LOW-DISSIPATION ELECTRONICS, AND
MULTI-LOGIC COMPUTING CIRCUITS**

Igor Lukyanchuk, Daoud Mezanne, Anna Razumnaya, Yuri Tikhonov,
Elena Zaitseva, Vitaly Levashenko

19⁰⁰ – 20⁰⁰ – dinner



TUESDAY, 23TH OF OCTOBER, 2018

8⁰⁰ – 9⁰⁰ – breakfast

PLENARY

Chairman: **Malchevskii I.**

9⁰⁰– 9⁵⁰ – **PHONON SPECTRUM OF COMPOSITE OXIDE SYSTEMS OF THE PEROVSKITE FAMILY IN THE CONCEPT OF SUPER SPACE SYMMETRY**

Shkyrta I. M., **Nebola I. I.**, Katanitsa A. F., Ochkaev I. I.

9⁵⁰– 10⁴⁰ – **SEMICONDUCTORS – FERROICS OF PHOSPHOROUS CHALCOGENIDES FOR VERY DENSE AND FAST MEMORY ELEMENTS**

Vysochanskii Yu., Haborets V., Yevych R., Glukhov K., Babuka T., Medulych M., Kohutych A., Molnar A.

10⁴⁰ – 11¹⁰ – coffee-break

PLENARY

Chairman: **Vysochanskii Yu.**

11¹⁰ – 12⁰⁰ – **NEW NONLINEAR NON-STATIONARY OPTICAL PHENOMENA IN THE INTERACTION OF ULTRASHORT LIGHT PULSES WITH MATERIALS FOR OPTOELECTRONIC AND TELECOMMUNICATION USE: FUNDAMENTAL AND APPLIED ASPECTS**

Blonskyi I.V., Kadan V.M., Dmytruk A.M., Dmitruk I.M., Korenyuk P.I., Pavlov I.A., Pavlova S.V., Rybak A.S., Shpotyuk O.I., Yarusevych O.I.

SECTION

12⁰⁰ – 12²⁰ – **GRAPHENE-LIKE MATERIALS AND NANOCOMPOSITES BASED THEREON: MECHANOCHEMICAL PREPARATION, STRUCTURE, PROPERTIES AND FUNCTIONAL APPLICATION**

Posudievsky O.Yu., Kondratyuk A.S., Kozarenko O.A., Koshechko V.G., Pokhodenko V.D.

12²⁰ – 12⁴⁰ – **HIGH TEMPERATURE PLASMONS AND CARRIER MOBILITY SIMULATION IN n-type WIDE HgTe QUANTUM WELLS**

Melezhik E.O., Gumenjuk-Sichevska J.V., Mikhailov N.N.

12⁴⁰ – 13⁰⁰ – **NANOCLASTERS IN HEA COATING**

Danylenko M.I., Gorban' V.F., Krapivka M.O., Firstov S.O.

13⁰⁰ – 14⁰⁰ – lunch



SECTION

Chairman: **Uvarov V.**

14⁰⁰ – 14²⁰ – THE ALUMINUM METALOTERMIC ALLOYS

Zhiguts Yu.Yu., Lazar V.F., Levdar K.E.

14²⁰ – 14⁴⁰ – METHOD OF DETERMINATION OF PHASE COMPOSITION OF SYNTHESIZED ALLOYS BY THE METHODS OF GEOMETRIC THERMODYNAMICS

Zhiguts Yu.Yu., Polishchuk O.S., Beyresh Ya.Ya.

14⁴⁰ – 15⁰⁰ – PROPERTIES OF CLUSTERED METAL AND HIGH-ENTROPY ALLOY COATINGS TiZrHfVNbTa

Gorban V.F., Andreev A.A., Firstov S.A., Chikryzhov A.M., Stolbovoy V.A., Krapivka N.A.

15⁰⁰ – 15³⁰ – coffee-break

SECTION

Chairman: **Kokenyesi S.**

15³⁰ – 15⁵⁰ – STRUCTURE AND PROPERTIES OF NANOCRYSTALLINE COPPER- AND ALUMINUM-BASED CONDENSATES

Zhadko M.A., Lutsenko E.V., Sobol' O.V., Zubkov A.I.

15⁵⁰ – 16¹⁰ – SUPERCONDUCTIVITY OF GASB MICROCRYSTALS AT WEAK MAGNETIC FIELDS

Druzhinin A.A., Ostrovskii I.P., Khoverko Yu.M., Liakh-Kaguy N.S.

16¹⁰ – 16³⁰ – PHOTOCATALYTIC PROPERTIES OF POLYSULFONIC MEMBRANES MODIFIED WITH SnO₂ NANOPARTICLES

Kolesnyk I., Dzhodzhyk O., Konovalova V., Burban A.

16³⁰ – 16⁵⁰ – SPHEROIDAL MULTILAYER NANOSCALE CARBON CLUSTERS - POLYFUNCTIONAL FUEL ADDITIVES OF NEW GENERATION

Polunkin Ye.V., Gaidai O.O., Bereznitskyi Ya.O., Pilyavskyi V.S., Kamenieva T.M.

16⁵⁰ – 18⁰⁰ – POSTER SECTION (DISCUSSION)

19⁰⁰ – 20⁰⁰ – dinner



WEDNESDAY, 24TH OF OCTOBER, 2018

8⁰⁰ – 9⁰⁰ – breakfast

PLENARY

Chairman: **Bespalov S.**

9⁰⁰– 9⁵⁰ – **DEVELOPMENT OF FUNCTIONAL POLYMER NANOCOMPOSITES FOR DIRECT OPTICAL RELIEF RECORDING**
Molnar S., Burunkova J., Bohdan R., Bako J., Daroczi L., **Kokenyesi S.**

9⁵⁰ – 10²⁰ – **INFLUENCE OF TECHNOLOGICAL FACTORS AND THERMAL TREATMENT ON THE STRUCTURE AND PROPERTIES OF CHALCOIODIDE GLASSES AND NANO-, MYCROCOMPOSITES ON THEIR BASIS**
Rubish V.M., Rizak I.M., Mykaylo O.A., Maryan V.M., Gorina O.V., Gasinets S.M.

10²⁰ – 10⁵⁰ – coffee-break

SECTION

Chairman: **Rubish V.**

10⁵⁰ – 11¹⁰ – **SELF-ORGANIZATION OF CRACKING IN THIN FILMS OF CHALCOGENIDE GLASS As₂S₃**
Kozak M.I., Loya V.Yu., Zhikharev V.N., Fedelesh V.I.

11¹⁰ – 11³⁰ – **MAGNETICALLY SENSITIVE NANOCOMPOSITES BASED ON MAGNETITE AND GEMCITABINE FOR APPLICATION IN ONCOLOGY**
Petranovska A.L., Abramov M.V., **Opanashchuk N.M.**, Turanska S.P., Kussyak N.V., Gorbyk P.P., Lukyanova N.Yu., Chekhun V.F.

11³⁰ – 11⁵⁰ – **SELF –ORGANIZED HETEROSTRUCTURES INORGANIC CARRIER – NATIVE ENZYME MIXTURE AND THEIR ELECTROCHEMICAL APPLICATIONS**
Kazdobin K.A., Pershina K.D., Khodykina M.O., Trunova E.K., Bepaliuk A.A.

12⁰⁰ – 13⁰⁰ – lunch

PLENARY

Chairman: **Mykaylo O.**

13³⁰ – 14⁰⁰ – **THE EFFECT OF VACANCIES ON CHARACTERISTICS OF METAL CLUSTERS**
Pogosov V.V., Reva V.I., Korotun A.V.



14⁰⁰ – 14³⁰ – NEWTYPE RECORDING MEDIA BASED ON “NOBLE METAL NANOPARTICLES/ChVS FILMS” COMPOSITIES

Rubish V.M., Trunov M.L., Lytvyn P.M.

**14³⁰ – 19⁰⁰ – POSTER SECTION (DISCUSSION)
EXCURSION**

19⁰⁰ – 20⁰⁰ – dinner



THURSDAY, 25TH OF OCTOBER, 2018

8⁰⁰ – 9⁰⁰ – breakfast

SECTION

9³⁰– 12³⁰ – Satellite conference ACCELERATE

Chairman: **Rizak V.**

CERIC-ERIC, THE MULTI-TECHNIQUE RESEARCH INFRASTRUCTURE FOR MATERIALS RESEARCH IN CENTRAL-EASTERN EUROPE

Matthias Girod

TEACHER OF PHYSICS AND INNOVATION CHANGES IN SLOVAK SCHOOL EDUCATION

Seben Vladimir

"HORIZON" OF DEVELOPMENT AND INNOVATION FOR UzhNU AND TRANSCARPATIA

Taisiya Symochko

XPS, SRPES, LEED AND NEXAFS INVESTIGATION OF ADENINE THIN FILM ON TITANIUM OXIDE SURFACES

V. Matolin A. Barta, S. Bercha, N. Popovych, N. Tsud, T. Duchon, K. Veltruska, I. Khalakhan, V. Rizak

X-RAY STUDY OF ELECTROCHEMICAL STERN LAYER: ORDERING AND LAYERING

Yihua Liu, Tomoya Kawaguchi, Michael S. Pierce, **Vladimir Komanicky**, Hoydoo You

HIGH-PRESSURE SINGLE-CRYSTAL SYNCHROTRON DIFFRACTION STUDY OF LIKB₄O₇

L. Dubrovinsky, I. Chobal, A. Pakhomova, O. Chobal, D. Simonova, A. Kurnosov, V. Adamiv, V. Rizak

NEAR-AMBIENT PRESSURE XPS STUDIES OF THE CATALYTIC AND GAS SENSING PROPERTIES OF COPPER AND TIN OXIDES

Vorokhta M., Khalakhan I., Hozák P., Vršata M., Vondráček M., Lančok J., Matolín V.

INFLUENCE AMMONIA AND HUMIDITY ON THE LUMINESCENCE OF QUANTUM DOTS IN NANOCOMPOSITE STRUCTURES BASED ON BACTERIOHODOPSIN

S. O. Korposh, I. I. Trikur, I. Y. Tsoma, M.Y. Sichka, V. M. Rizak

MICRO- AND NANOSIZED PROTECTIVE ELEMENTS ON As-Se AND Ge-As-Se THIN FILMS

A. Feher, B.V. Bilanych, O. Shylenko, V. Komanicky, V.S. Bilanych, I.M. Rizak, V.M. Rizak



13⁰⁰ – 14⁰⁰ – lunch

PLENARY

Chairman: **Mitsa V.**

14³⁰– 15²⁰ – ON THE DERIVATION OF THE DIRAC EQUATION

Simulik V.M., Bulgakova A.I., Zajac T.M.

15²⁰ – 16¹⁰ – CARBONIZATION PROCESSES AND FORMATION OF METAL NANOPARTICLES IN ION-IRRADIATED POLYMERS AND COMPOSITE MATERIALS: POSITRON ANNIHILATION SPECTROSCOPY APPROACH

Kavetsky T. and Kiv A.

16¹⁰ –16⁴⁰– coffee-break

SECTION

Chairman: **Kavetsky T.**

16⁴⁰ – 17⁰⁰ – THE FLASH-LAMP TREATMENT OF THE Cu₂ZnSnS₄ NANOCRYSTALS AND THE RAMAN CHARACTERIZATION OF POSSIBLE SECONDARY PHASES SYNTHESIZED BY THE SAME METHOD

Havryliuk Ye.O., Dzhagan V.M. , Yukhymchuk V.O. , Valakh M.Ya.

17⁰⁰ – 17²⁰– DFT-CALCULATIONS OF THE STABILITY AND RECONSTRUCTION OF THE CRYSTAL SURFACE

Nykyrui L.I., Naidych B.P.

17²⁰ – 18⁰⁰–POSTER SECTION (DISCUSSION)

19⁰⁰ – 20⁰⁰ –dinner



FRIDAY, 26TH OF OCTOBER, 2018

8⁰⁰ – 9⁰⁰ – breakfast

PLENARY

Chairman: **Uvarov V.**

9⁰⁰ – 9⁵⁰ – COORDINATION DEPENDENCE OF BOSON PEAK POSITION AND CRYOGENIC THERMAL ANOMALIES IN NANOSTRUCTURED As_xS_{100-x} GLASSES

V. Mitsa, A. Feher, V. Tkáč, R. Holomb, M. Veres, N. Shumilo

9⁵⁰ – 10⁴⁰ – NANOSTRUCTURED UREASIL-BASED POLYMER COMPOSITES FOR CONSTRUCTION OF AMPEROMETRIC ENZYME BIOSENSORS: STATE-OF-THE-ART AND FUTURE OUTLOOK

Kavetskyy T.

10⁴⁰ – 11¹⁰ – coffee-break

11¹⁰ – Closing MEETING

POSTERS

- **OBLIQUE LOCALIZED JOSEPHSON PLASMA WAVES IN A PLATE OF LAYERED SUPERCONDUCTOR**
 Shymkiv D.V., Rokhmanova T., Maizelis Z.A., Kadygrob D.V., Apostolov S.S.
- **NANOCOMPOSITES OF GRAPHENE-LIKE CARBON AND COBALT OXIDES FOR CATALYTIC HYDROGENATION OF QUINOLINE**
Asaula V. N., Pariiska O. O., Ryabukhin S. V., Gavrilenko K.S.,
 Volochnyuk D. M., Kolotilov S. V.
- **ELECTRONIC AND VIBRATIONAL PROPERTIES OF Cu(Ag)InP₂S(Se)₆ CRYSTALS: THEORETICAL INVESTIGATION**
Babuka T., Glukhov K., Vysochanskii Yu., Makowska-Janusik M.
- **METHOD FOR IDENTIFICATION OF OPTICAL RESONANCES OF METAL FILMS**
Barabash M.Yu., Vlaykov G.G., Martynchuk V.E., Kolesnichenko A.A.,
 Rybov L.V.
- **INVESTIGATIONS OF MECHANICAL PROPERTIES IN Cu₆PS₅I-BASED THIN FILMS**
Bendak A.V., Bilanych V.V., Skubenych K.V., Bilanych V.S., Studenyak I.P.
- **EFFECT OF GREEN BODY ANNEALING ON LASER PERFORMANCE OF YAG:Nd³⁺ CERAMICS**
Bezuglyi V.A., Yavetskiy R.P., Parkhomenko S.V., Vorona I.O., Tolmachev A.V., Kosyanov D.Y., Kuryavyi V.G., Mayorov V.Y., Gheorghe L., Croitoru G., Enculescu M.
- **MAGNETO - INDUCED ANISOTROPY IN A MAGNETOACTIVE ELASTOMER**
A. V. Bodnaruk, A. Brunhuber, A. A. Snarskii, M. M. Kulyk, V. M. Kalita, S. M. Ryabchenko and Mikhail Shamonin
- **Hg₃Te₂Cl₂ AS AN EFFICIENT NANOMATERIAL FOR NONLINEAR OPTICAL APPLICATIONS**
 Bokotey O.V., Slyvka V.A., Bokotey O.O., Slivka A.G.
- **ON THE STRUCTURAL AND OPTICAL PROPERTIES OF TERNARY THALLIUM CHALCOGENIDE COMPOUNDS**
Bokotey O.V., Slivka A.G.



- **HIGH-TEMPERATURE ELECTROCHEMICAL SYNTHESIS OF MOLYBDENUM CARBIDE NANOSTRUCTURED COATINGS ON THE SURFACES OF DIELECTRICS AND SEMICONDUCTORS IN IONIC MELTS**
Gab A.I., Shakhnin D.B., Lukashenko T.F., Boliukh O.S., Malyshev V.V.
- **COMPOSITE POLYMER FIBERS COATED WITH NANOSTRUCTURED INORGANIC PARTICLES: SYNTHESIS AND APPLICATION**
Bondar Yu., Kuzenko S., Slivinsky V.
- **LUMINESCENT PROPERTIES OF YTTRIUM OXIDE NANOPOWDERS**
Burlak G., Vilinskaya L.
- **PORPHYRINS WITH PERIPHERAL SUBSTITUENTS AS INHIBITORS OF AMYLOID FIBRIL FORMATION**
Kovalska V., Chernii S., Losytskyy M., Kelm A., Yarmoluk S., Gorski A., Chernii V.
- **SYNTHESIS OF PHOTOCATALYTIC ZnO NANOMATERIALS FORM DIFFERENT ROUTES**
Danilenko I., Gorban O., Volkova G., Glazunova V., Burkhovetsky V., Bryukhanova I., Konstantinova T.
- **INVESTIGATION CRYSTALLIZATION KINETICS OF Ge-As-TE AND As-S (Sb) -I SYSTEM FILMS USING OPTICAL METHOD**
Turianytsia I.I., Tsyhyka V.V., Kozusenok O.V., Chychura I.I. Slavik V.M.
- **OBTAINING A SUBMICROCRYSTALLINE ZR-TI-NB ALLOY USING HIGH PRESSURE TORSION**
Kulagin R., Mazilkin A., Beygelzimer Y., Savvakina D., Zverkova I., Oryshych D., Davydenko O.
- **IMPROVEMENT OF THE METHOD OF SINGLE OPTICALLY ACTIVE DEFECTS ACTIVATION IN 4H-SIC**
Demenskyi O. M., Glukhova V. I., Krasnov V. A., Shutov S. V., Yerochin S. Yu.
- **THE EFFECT OF EXTERNAL FACTORS ON THE STRUCTURAL, PHYSICAL AND CHEMICAL PARAMETERS OF WATER**
S.O. Dolenko, H.M. Kravchenko, M.D. Skilska
- **INTERACTION OF ELECTRONS WITH NANOCLUSTERS OF ATOMIC AND MOLECULAR GASES**
Doronin Yu.S., Danylchenko O.G., Konotop O.P., Tkachenko A.A., Vakula V.L.



- **THERMAL DIFFUSIVITY EVALUATION AND SEIRA-SPECTROSCOPY OF EXPANDED GRAPHITE - CARBON NANOTUBES COMPOSITES**

Morozovsky N. V., Barabash Yu. M., Dovbeshko G. I., Grebelna Yu. V., Kartel M. T., Sementsov Yu. I.
- **MASS-SPECTRUM AND EVAPORATION MECHANISM OF AS-S GLASSES**

Ivanitsky V.P., Kryshenik V.M., Kolinko S.O.
- **INVESTIGATION OF THE INFLUENCE OF GEOMETRY AND TECHNOLOGICAL PARAMETERS OF PRODUCTION ON THE STRUCTURE AND PROPERTIES OF SPHERICAL CELLULAR STRUCTURES OBTAINED BY SLM**

Travyanov A.Y., Petrovskiy P.V., Cheverikin V.V., Sokolov P.Yu., Davidenko A.A., Fartushna I.V.
- **KINETICS OF DISPERSION DURING ANNEALING IN VACUUM OF NIOBIUM AND HAFNIUM NANOFILMS DEPOSITED ONTO NONMETALLIC MATERIALS**

Gab I.I., Stetsyuk T.V., Kostyuk B.D., Naidich Y.V.
- **INFLUENCE OF LOW TEMPERATURE ANNEALING ON CRYSTALLIZATION PROCESSES IN $(As_2S_3)_{100-x}(SbSI)_x$ GLASSES**

Gasnets S.M., Gorina O.V., Horvat Yu.A., Rizak I.M., Solomon A.M., Shpyrko G.M., Bandurin Yu.A.
- **FERROELECTRICITY IN UNDOPED BINARY OXIDES**

Glinchuk M. D., Kalinin S. V. and Morozovska A. N.
- **TEMPERATURE DEPENDENCE OF RAMAN-ACTIVE MODES OF $TlIn(S_{0.95}Se_{0.05})_2$ SINGLE CRYSTAL**

Gomonnai O.O., Ludemann M., Gomonnai A.V., Roman I.Yu., Guranich P.P., Slivka A.G., Zahn D.R.T.
- **Ag-DECORATED WIDE GAP OXIDES**

Gorban O., Danilenko I., Volkova G., Gorban S., Akhkozov L., Bryukhanova I., Konstantinova T.
- **NANOSTRUCTURED WEAR-RESISTANT SURFACE LAYERS Cu-Fe-O**

Grypachevskiy O.M., Tykhonovych V.V., Uvarov V.M.
- **STRUCTURAL PROPERTIES AND CHEMICAL COMPOSITION OF THE MICRO- AND MESOPOROUS ACTIVATED CARBON SURFACE**

Guzenko N.V., Lodewyckx P., László K.



- **STRUCTURAL AND OPTICAL STUDY OF $(\text{Ge}_{40}\text{S}_{60})_{100-x}\text{Bi}_x$ THIN FILMS PREPARED BY THERMAL EVAPORATION**

Horvat H., Khalakhan I., Vlcek M., Rizak V.
- **INFLUENCE OF INTRINSIC POINT DEFECTS ON THE ELECTRONIC STRUCTURE, PHOTOELECTRIC AND PHOTOLUMINESCENCE PROPERTIES OF GeSe_2**

Bletskan D. I., Kabatsii V. N., Vakulchak V.V., Cheryanyk D.R.
- **DYNAMICAL AND ELASTIC PROPERTIES CHANGES INDUCED BY SUBSTITUTIONAL IMPURITIES IN β -InSe QUASI-TWO-DIMENSIONAL CRYSTALS**

Kharkhalis L.Yu., Glukhov K.E., Babuka T.Ya., Lyakh M.V.
- **MULTIFUNCTIONAL NANOSTRUCTURED COATINGS, DEPOSITED BY VACUUM-ARC METHOD**

Klimenko I.O., Belous V.A., Ovcharenko V.D., Kuprin A.S.
- **STRUCTURAL TRANSFORMATION OF As_2S_3 CHALCOGENIDE MATERIALS BY DOPING OF Mn AS PROSPECTIVE MATERIALS FOR THE NANOOPTICS AND COMPUTER ENGINEERING**

Kondrat O., Holomb R., Csik A., Takats V., Kondrat O., Shumylo N., Ihnatolia P., Olashyn D., Veres M., Paiuk O., Stronski A.V. and Mitsa V.M.
- **THE DIPOLE POLARIZABILITY OF AN ELLIPSOIDAL BIMETALLIC NANOPARTICLE**

Korotun A. V., Koval' A. O. and Kurbatsky V. P.
- **SUBDIFFUSION IMPEDANCE OF STRUCTURES WITH QUANTUM ENERGY ACCUMULATION MECHANISM BASED ON SUPRAMOLECULAR ENCAPSULATED GaSe**

Kostrobij P., Grygorchak I., Ivashchyshyn F., Markovych B., Viznovych O., Tokarchuk M.
- **THE CHEMICAL POTENTIAL AND THE WORK FUNCTION OF A METAL FILM ON A DIELECTRIC SUBSTRATE**

Kostrobij P., Kurylyak I., Markovych B.
- **TUNGSTEN AND MOLYBDENUM CARBIDE NANOSTRUCTURED POWDERS AND COATINGS OBTAINING BY MOLTEN SALTS ELECTROLYSIS**

Malyshev V.V., Shakhnin D.B., Gab A.I., Zalubovskyi M.G., Kovtoniuk A.V.
- **CALCULATING METHOD OF THE EVAPORATION PROBABILITY OF CHALCOGENIDE GLASSES VAPOUR CLUSTERS**

Kovtunenکو V.S.



- **2D-MATERIALS BASED ELECTROCATALYSTS FOR HYDROGEN EVOLUTION AND OXYGEN REDUCTION**

Kozarenko O. A., Kondratyuk A.S., Posudievsky O.Yu, Koshechko V.G., Pokhodenko V.D.
- **PRESENTATION DEVELOPMENT OF INSTITUTE FOR INFORMATION RECORDING IN THE FIELD OF HIGH TECHNOLOGY IN THE INSTITUTE SITE**

Kryuchyn A.A., Solonina N.V.
- **INTERACTION OF POLYMETHINE DYES WITH DETONATION NANODIAMONDS IN AQUEOUS SOLUTIONS**

Kulinich A. V., Ishchenko A. A., Mchedlov-Petrossyan N. O., Kamneva N. N., Ōsawa E.
- **INFLUENCE OF NATURAL MINERALS NANOPARTICLES ON THE SYNTHESIS OF BIOLOGICALLY ACTIVE COMPOUNDS BY BACTERIA-COMPONENTS OF THE PREPARATION AZOGRAN**

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SURFACE MODIFICATION OF CHALCOGENIDE AMORPHOUS FILMS

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The excellent transmittance of chalcogenide glasses and films and wide range of photoinduced effects that they exhibit (for example, photocrystallization, photopolymerization), generally accompanied by changes in the optical characteristics and, particularly shifts in the absorption edge (photodarkening or photobleaching), allow their use as absorption filters, optical waveguides and circuits, efficient holographic gratings and other optical diffraction elements. Besides chalcogenide amorphous films are promising materials for the formation of various nanosides relief structures for the superdense recording of information.

We present the results of study the influence of laser irradiation conditions on the optical characteristics of chalcogenide films (As-S-Se, As-Sb-S, Ge-S, Ge-Se, Ge-S-Se systems) and films treatment conditions by different organic and inorganic selective enchants.

Amorphous films various thicknesses of arsenic, antimony and germanium chalcogenides were obtained by the method of vacuum evaporation of the corresponding composition glasses from quasiclosed effusive cells on unheated glass substrates. Investigations of transmission spectra in wavelength region of 450-1100 nm were carried out by means of „МДР-23” spectrometer at room temperature. Defocused irradiation of blue, green and red semiconductor lasers were used for exposure of films.

Investigations have shown than with increasing of irradiation time absorption edge of arsenic and antimony chalcogenide films is shifting into longwave range (photodarkening of films) testifying to decrease of pseudoforbidden gap width E_g and increase of refractive index n . Light exposure of germanium films results in a shift of transmission spectra to the shortwave range (photobleaching of films). The films compositions with maximum changes of optical characteristics are determined.

After exposure the layer treatment was made by different organic and inorganic enchants. It was shown that with increasing of enchant temperature etching rate is growing. It was established that quality of surface relief dependent on exposure time of films selective enchants temperature, etching time.

The investigations have shown the possibility of forming nanosized surface relief structures of various morphology.