Contents

Characterization and properties

Growing of large-sized high-quality sapphire by the Kyropoulos method

Ie. Kryvonosov, E. Dolzhenkova, P. Konevskiy, L. Lytvynov, A. Voloshyn *5*

Thermal stability of perovskites $CH_3NH_3PbX_3$ (X = Cl, Br, I)

S.S. Smolyak, V.L. Karbivskyy, V.Kh. Kasianenko, S.A. Nedilko, S.I. Shulyma, N.A.Kurgan, O.A. Puzko, L.I. Karbivska, A.P. Soroka *13*

Absorption of electromagnetic radiation by an ordered composite based on a cubic lattice of metallic nanodimers

L.O. Abramenko, V.M. Matiushyn, A.V. Korotun *21*

Growing $Ge_{1-x}Sn_x$ solid solutions on Ge, GaAs substrates

A.Sh.Razzokov, M.A.Shonazarova, J.A.Razzakov *28*

Sodium, magnesium and carbonate-containing calcium phosphates: synthesis and investigation

N. Yu. Strutynska, Ye. O. Komashchenko, O.V. Livitska, I.I. Grynyuk, D.K. Prochorenko *35*

Double partial substitution effect of silver (Ag) and strontium (Sr) on the structural and electrical properties of high temperature $Bi_{2-x}Ag_xBa_{2-y}Sr_yCa_2Cu_3O_{10+\delta}$ superconductor

Mudatheer M. Al-Slivani, Muhammod A. Hammod, Mazin A. Abed *42*

The effect of plasma coatings on the properties of low-alloy steels

E. Ermilova, D.B. Hlushkova, V.M. Volchuk *50*

High temperature oxidation of AlB_{12}-Al electric spark coatings on Steel 45

A.P.Umanskyi, V.B.Muratov, V.E.Sheludko, T.V.Khomko, I.S.Martsenyuk, M.A.Vasilkovskaya, V.V.Kremenitsky *56*

Functional cobalt-vanadium coatings deposition via programmed electrolysis mode

M.D. Sakhnenko, Yu. A. Zhelavska, V.O. Proskurina, A.V. Dzheniuk, S.I. Rudneva *63*

Tribological properties of MAO coatings on aluminum alloy AL25

V. Subbotina, V. Bilozerov, O. Subbotin, O. Volkov, S. Knyazev, V. Ryaboshtan, V. Barannicov , V. Bobrov , I. Kalinichenco , S. Fesyukov. *67*

The influence of nickel-clad chromium carbide on the tribological properties of composite based on phenylone aromatic polyamide

Ya.E. Yarovyi, Ye.A. Yeriomina, A.-M.V. Tomina. *72*

Microstructure, dynamics, and temperature behavior of ***L***-menthol, salicylaldoxime, and their binary mixture: a molecular dynamics simulation study

M. Yu. Cherniakova, A.V. Kyrychenko, K. N. Belikov *77*

Low-cost ceramic membrane supports based on ukrainian kaolin and saponite
Y. Molchan, L. Bohdan, S. Kyrii, O. Tymoshenko, I. Pylypenko, A. Burmak, G. Vasyliev, T. Dontsova 87

Application of cellulose nanofibrils in polyvinyl alcohol composite films
Linjuan Duan, Chunxia Chen, Xuan Hou, Bei Liu. 97

Modeling and simulation

Effective polarizability and optical resonances of a square lattice of rod-like metal nanoparticles on a dielectric substrate
N.I. Pavlyshche, A.V. Korotun, V.P. Kurbatsky, R.Yu. Korolkov *108*

Majorana and Dirac fermion excitations in $La_{0.15}Sm_{0.85}MnO_{3+\delta}$, controlled by external magnetic field
F.N. Bukhanko *115*

Devices and methods

Indolenine-based semisquaraine dye for visual detection and sensing of mercury (II)
R. P. Svoiakov, O. G. Kulyk, I. V. Hovor, H. S. Vlasenko, A. L. Tatarets, O. S. Kolosova *126*

Comparative qualitative analysis of hot pressing of zirconium dioxide nanopowders
E.S.Hevorkian, *M.Rucki*, *R.V.Vovk, V.P.Nerubatskyi*, *D.Pieniak*, *V.O.Chyshkala* 134

Selective recovery of copper from metal-rich particles in waste printed circuit boards by mechanical processing
Yonglin Xu. *146*

Effective separation factor depending on distillation degree and temperature
A.I. Kravchenko, A.I. Zhukov *157*

Multifractal approach to assessing the heterogeneity of carbon alloys
A Nikitin, DB Hlushkova, VM Volchuk, VM Ragulin *161*

Radiation-resistant plastic scintillator on a polystyrene-polyphenymetylsiloxane mixed base
D.A. Yelisieiev, O.V. Yelisieieva, Yu.A. Gurkalenko, P.N. Zhmurin, V.D. Alekseev, L.O.Miroshnichenko *166*