



ABSTRACT BOOK

**International research
and practice conference:**

NANOTECHNOLOGY AND NANOMATERIALS (NANO-2018)

**27-30 August 2018
Kyiv, Ukraine**

**dedicated to the 100th Anniversary
of the National Academy of Sciences of Ukraine**

**INTERNATIONAL RESEARCH
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**BOOK OF ABSTR
ACTS**

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This book contains the abstracts of contributions presented at the International research and practice conference “Nanotechnology and Nanomaterials” (NANO-2018).

The NANO-2018 Conference was organized by the Institute of Physics of NAS of Ukraine with the participation of the Taras Shevchenko National University of Kyiv (Ukraine), University of Tartu (Estonia), University of Turin (Italy) and Pierre and Marie Curie University – Paris 6 (France).

NANO-2018 was the sixth conference in the series of NANO-conferences initiated by the Institute of Physics of NAS of Ukraine in 2012 in the framework of FP7 Nanotwinning project. From year to year, they attract more attention and participants. In 2012, the first meeting was held in the format of International Summer School for young scientists «Nanotechnology: from fundamental research to innovations». The 2013 and 2014 conferences were organized in conjunction with the International Summer Schools for young scientists under the same title. In 2013, this event was attended by more than 300 scientists, in 2014-2016, 450 scientists took part and in 2017 it gathered above 700 participants from Ukraine, Poland, Italy, Estonia, France, Austria, Germany, Greece, Turkey, USA, Romania, Moldova, Czech Republic, Taiwan, Lithuania, Egypt, Iran, India, Algeria, Indonesia and other countries. In 2017 Organizer Committee has received more than 700 application forms from about 25 countries of the world.

The NANO-2018 conference brought together leading scientists and young researchers from many countries of the world. This year its topics were as follows: Nanobiotechnology for health-care; Nanochemistry and biotechnology; Nanocomposites and nanomaterials; Nanoobjects microscopy; Nanooptics and photonics; Nanoplasmonics and surface enhanced spectroscopy; Nanoscale physics; Nanostructured surfaces; Physico-chemical nanomaterials science.

This year the NANO-2018 Conference was organized in the framework of the NAS of Ukraine Program «Fundamental issues of creation of new nanomaterials and nanotechnologies» for 2015-2019.

Conference of this year is dedicated to celebration of 100 years of National Academy of Science of Ukraine foundation. It's a great honor for us to organized conference where our scientists can get, exchange and share experience with abroad colleagues, and it is pleasure to be part of this. We always will work in this direction.

Website of the Nano-2018 conference: <http://nano-conference.iop.kiev.ua/>

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The influence of La^{3+} doping on the structure and properties of $\text{Ni}_{0.5}\text{Co}_{0.5}\text{Fe}_2\text{O}_4$ synthesized by various methods

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Spinel ferrite is one of the most common areas of research. They have attracted attention due to their possible application as adsorbents, photocatalysts, in magnetic hyperthermia etc. The well-known methods for ferrites synthesis are sol-gel auto-combustion method, co-precipitation method, hydrothermal method, microwave synthesis, etc. The structure and properties of ferrites could be altered by doping with rare-earth ions such as La, Sm, Gd, Dy, Yb, Er, Tb, Ce and Y.

The object of this study is Ni-Co ferrites doped with lanthanum ions. The $\text{Ni}_{0.5}\text{Co}_{0.5}\text{La}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0.0, 0.025; 0.05, 0.075$) nanoparticles were obtained by both techniques – sol-gel autocombustion method (PVA as reducing agent and fuel) and co-precipitation method (NaBH_4 as precipitator). Nickel nitrate ($\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$), cobalt acetate ($\text{Co}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$), ferric nitrate ($\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$) and lanthanum nitrate ($\text{La}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$) were used as precursors.

The structural, morphological and magnetic properties of obtained nanoparticles were characterized by XRD, SEM, EDS, FTIR, and Mossbauer spectroscopy. The results of XRD indicate the formation of a single-phase cubic spinel with a space group Fd-3m. The second phase of the lanthanum oxide or lanthanum orthoferrite were not identified in the all samples. From the data of the XRD analysis, the lattice parameter and the crystallite size were calculated. The average crystallite size of the ferrites are in the range from 12 to 19 nm. The lattice parameter decreases with increasing of lanthanum ions content. The SEM results indicate that the particles are homogenous and slightly agglomerated. The EDS analysis indicates the formation of La-doped nickel-cobalt ferrites. The attempt has been made to in-depth study of their structural, morphological and functional properties.

Author Index

- Srivastava O.N. 457
 Stara T. 735
 Starchenko I.V. 409
 Starcheskyy V. 478
 Starchuk M. P. 237
 Starko I.Y. 260
 Starukh G.M. 241
 Stasyuk A. 519
 Stasyuk B. M. 243
 Stasyuk N.Ye. 48
 Stavinskaya O.N. 252
 Stavrou V.N. 337
 Stefanovich L.I. 776
 Stehr J. 663
 Stepanchikov D. 719
 Stepanyuk A.N. 695
 Stephan D. 214, 217, 347
 Sternik D. 145, 155, 319
 Stetsenko M.O. 167
 Stetsenko N. 223, 309
 Stetsiv Y. 125
 Stetsko A.E. 549
 Stetsyuk T.V. 551
 Stolyarchuk N. 206
 Stolyarchuk N.V. 93
 Strelchuk V. 264, 424, 483
 Strelchuk V.V. 456, 484, 568
 Strelko V.V. 576
 Strilchuk G. 429
 Strilchuk O. 592
 Strizhak P.E. 490, 515
 Strojanov O.V. 693
 Stronska O. 721
 Stronski A.V. 430, 495
 Strungar A.V. 242
 Stubrov Y.Y. 599
 Studenyak I.P. 650, 725
 Studzińska M. 8
 Studzinsky S.L. 179, 181
 Stupchuk M.S. 33
 Styopkin V.I. 618
 Suchanicz J. 278, 529
 Suchocki A. 763
 Sugakov V.I. 716
 Sukhodub L.B. 39, 184
 Sukhodub L.F. 39, 184
 Sukhomlyn V.I. 748
 Sulymenko O. 634
 Sulym I.Ya. 145
 Suprun A.D. 65, 554, 615, 630
 Suvorov O. 670
 Suvorov O.Yu. 669, 675
 Svavilny M.Ye. 570
 Svavilny N.E. 565
 Swapna S. Nair 216
 Swiatek Z. 710
 Sych O. 458
 Sydoruk V. 276, 478
 Sydorenko M.V. 30
 Sydorov D.O. 326
 Sylenko O.M. 66
 Synyakina S.A. 510
 Syrotyuk S. V. 662
 Syrotyuk S.V. 626
 Syvolozhskyy O. A., 254
 Syvorotka I.I. 705
 Szczesny R. 207
 Szeleszczuk O. 45
 Szlyk E. 207
 Szmuc K. 628
 Szymczak H. 435
 Szymocha A. 51
- T**
- Takanashi K. 435
 Takats V. 548, 560
 Talantsev A. 451
 Talbaoui S. 692
 Tamulevičius S. 246
 Tan M. 306
 Tarabara U.K. 22
 Tarahomi M. 452
 Tarakhan L. 226
 Tarakhan L.N. 366
 Taran N.Yu. 89, 91

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INNOVATION Forum - In 2018 the NANO Conference was combined with Innovation-2018 - big events for start-ups, technology parks and innovators during the first day of NANO Conference. Main purpose of event is to create platform for meeting of innovators and inventors with potential partners and accelerators of investment project. This Forum devoted to developing the Innovation Strategy of Ukraine.

Our publications



Abstracts Book of the 1st International Summer School (2012)

Abstracts Book of the 2nd International Summer School and International Conference NANO-2013

Abstracts Book of the 3-rd International Summer School and International Conference NANO-2014

Abstracts Book of the 4-th International Conference NANO-2015

Abstracts Book of the 5-th International Conference NANO-2016

Abstracts Book of the 6-th International Conference NANO-2017

O. Fesenko, L. Yatsenko and M. Brodin et al. (eds.), **Nanomaterials, Imaging techniques, Surface Studies, and Applications**, Springer Proceedings in Physics 146, DOI: 10.1007/978-1-4614-7675-7, ©Springer Science+Business, Media, New York 2013

O. Fesenko, L. Yatsenko (eds.), **Nanocomposites, Nanophotonics, Nanobiotechnology, and Applications**, Springer Proceedings in Physics 156, DOI: 10.1007/978-3-319-0661-0, ©Springer International Publishing, Switzerland 2014

O. Fesenko, L. Yatsenko, **Nanoplasmonics, Nano-Optics, Nanocomposites, and Surface Studies** 167, DOI: 10.1007/978-3-319-18543-9, ©Springer International Publishing, Switzerland 2015

O. Fesenko, L. Yatsenko, **Nanophysics, Nanophotonics, Surface Studies, and Applications** 183, DOI: 10.1007/978-3-319-30737-4, ©Springer International Publishing, Switzerland 2016

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