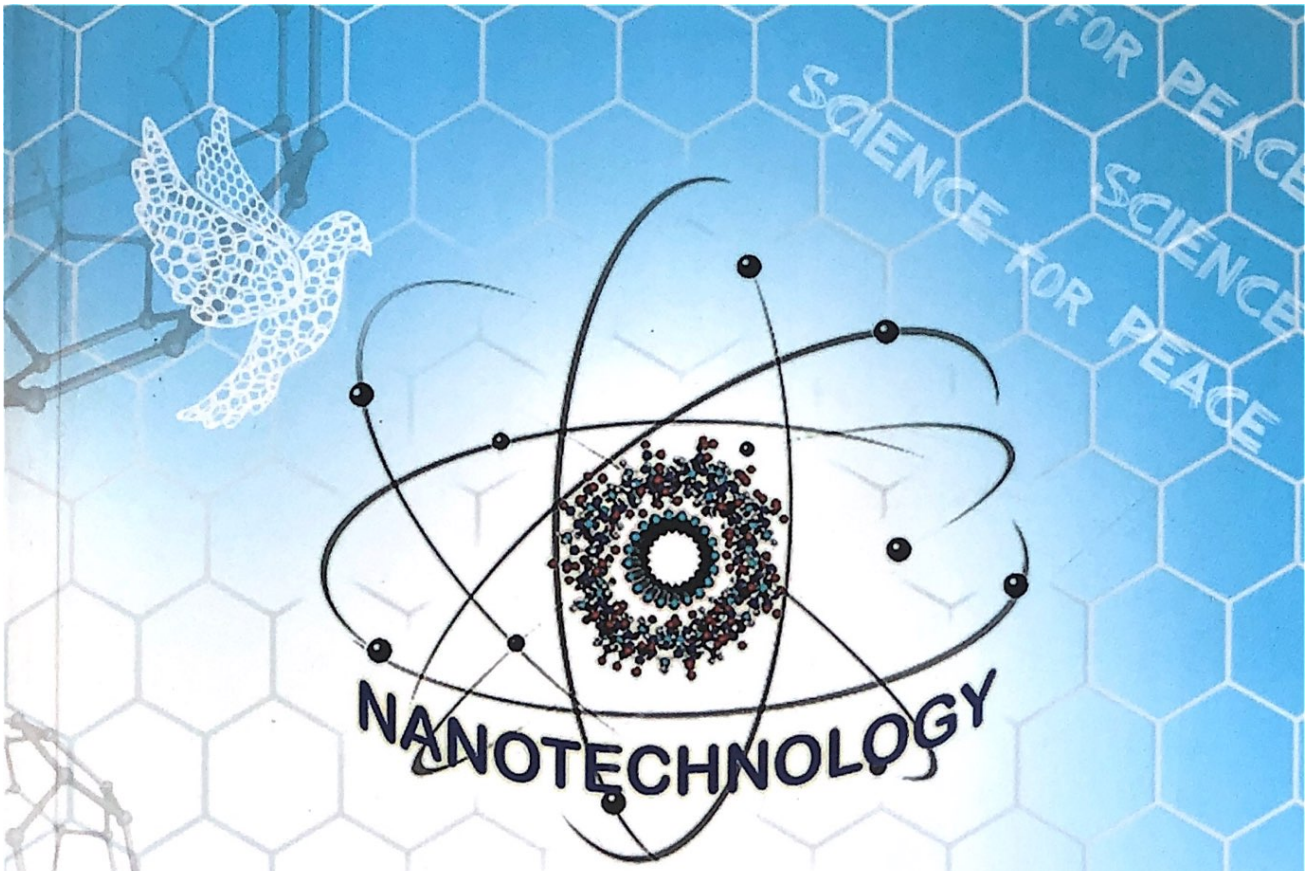

ABSTRACT BOOK

International research and practice conference:

NANOTECHNOLOGY AND NANOMATERIALS (NANO-2019)

27-30 August 2019
Lviv, Ukraine

INTERNATIONAL RESEARCH AND PRACTICE CONFERENCE "NANOTECHNOLOGY AND NANOMATERIALS" (NANO-2019)

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BOOK OF ABSTRACTS

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This book contains the abstracts of contributions presented at the International research and practice conference "Nanotechnology and Nanomaterials" (NANO-2019).

The NANO-2019 Conference was organized by the Institute of Physics of NAS of Ukraine with the participation of the Lviv Polytechnic National University, University of Tartu (Estonia), University of Turin (Italy) and Pierre and Marie Curie University – Paris 6 (France). The Conference is supported by EEN.

The NANO-2019 was the seventh conference in the series of NANO-conferences initiated by the Institute of Physics of NAS of Ukraine in 2012 in the framework of FP7 Nanotwining project. From year to year, the Conference 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 2017-2018 it gathered above 650 participants from Ukraine, Poland, Italy, Estonia, France, Austria, Germany, Greece, Turkey, USA, Romania, Moldova, Czech Republic, Republic of China, Lithuania, Egypt, Iran, India, Algeria, Indonesia and other countries. In 2019 Organizer Committee has received more than 700 application forms from about 25 countries of the world.

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

Website of the Nano-2019 conference: http://nano-conference.iop.kiev.ua//

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Adsorption properties of green synthesized cobalt-zinc ferrites

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Materials with spinel structure have long been a topic of interest because they may exhibit different properties depending on synthesis method. In this research, we have used the method of green chemistry for synthesizing Zn-doped cobalt ferrites with the general formula $Zn_xCo_{1-x}Fe_2O_4$ ($0 \leq x < 1.0$ with step 0.2). This is an eco-friendly method for the synthesis of monodisperse nanoparticles with small size, which are very important for different applications. Green chemistry is considered as one of the techniques applied for nanoparticles synthesis and involves the using of the non-toxic plant extracts as effective reducing and chelating agent. The permanent porosity of the frameworks and the Lewis acidity of the functionalization of magnetic nanoparticle sites have been considered as the major contributors to the catalytic activity. Cobalt-zinc ferrites were prepared by using sol–gel autocombustion method using plant extract as an effective reducing agent. The powders were characterized by XRD, SEM, EDS, and IR spectroscopy. Crystallite sizes of the samples are obtained by Scherer and Williamson-Hall methods and were found around 10 nm. Spinel structure of magnetic nanoparticles has been confirmed by XRD and IR spectroscopy. The IR spectra contain two main peaks that correspond to tetrahedral and octahedral sites in spinel structure respectively, and few peaks in the range 1300–3700 cm^{-1} that shown surface functionalization of magnetic nanoparticles. The surface morphology and elemental composition were proved by using SEM and EDS respectively. The synthesized cobalt-zinc ferrites were investigated as magnetic adsorbents using anionic dye Congo red as model pollutant. In addition, the $CoFe_2O_4$ nanoparticles obtained by eco-friendly method using plant extract as chelating agent could be used as good candidate for biomedical applications, such as drug delivery and hyperthermia application.

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