PHYSICAL AND TECHNOLOGICAL SCIENCES

Technology of inorganic, organic and hybrid material layers

Keywords: *technology of layers, vacuum thermal deposition, plasma deposition, thermal melting, inorganic materials, organic materials, hybrid materials, composite materials*

Vilnius University

Research group activities

The need for new optoelectronic devices aroused considerable interest.in technology of thin inorganic, organic, hybrid and composite material layers and, also, in 1D and 2D structures and materials. Aiming to address these problems and find a solution it is essential to understand how technology influences the formation of thin layers and interfaces and capacity to manage an intra– and interatomic bonds.

Our team is experienced in formation of inorganic, organic, hybrid and composite layers and structures from solid state, material solutions and gaseous state using vacuum thermal deposition, spin, coating, casting and CVD processes.

We investigate optical, electrical and structural features of deposited layers and structures and search for a new optoelectronic devices.

Proposal

- Investigation and development of thin layer technologies and structures using various deposition methods: spin-coating and casting from solutions, vacuum thermal deposition, plasma deposition, thermal melting.
- Investigate influence of deposition technology of various materials to density of local states in layers and interfaces by using optical, C-V, EPR spectroscopy, electrical and photoelectrical methods.
- Investigate compatibility problems of layers of various materials and technologies.

We seek partners for developing competitive research projects targeting HORIZON 2020 and other international programs.

Meet our team

Lead researcher

Prof. Dr. **Kęstutis Arlauskas**

Staff

Assoc. Prof. Dr. **Andrius Poškus**

Dr. **Gytis Sliaužys**

Dr. **Romaldas Purlys**

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PhD students

Rokas Dobužinskas

Vytautas Sabonis

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Research outcomes

Most important publications

- Dobuzinskas, R., Poskus, A., Arlauskas, K. 2015. X-ray sensitivity of small organic molecule and zinc cadmium sulfide mixture layers deposited using thermal melting technique. Organis Electronics, vol. 18, p. 37-43 DOI: 10.1016/j.orgel.2015.01.004.
- Poskus, A. 2016. Evaluation of computational models and cross sections used by MCNP6 for simulation of characteristic X-ray emission from thick targets bombarded by kiloelectronvolt electrons. Nuclear Instruments & Methods in Physics Research, B, vol. 383, p. 65–80.
- Poskus, A. 2016. Evaluation of computational models and cross sections used by MCNP6 for simulation of electron backscattering. Nuclear Instruments & Methods In Physics Research Section, B, vol. 368, p. 15–27.
- Grigaitis, T., Naujokaitis, A., Sabonis, V., Arlauskas, K. 2017. Electroluminescence from SiNx layers doped with Ce3+ ions. Thin Solid Films, vol. 622, p. 142-147 DOI: 10.1016/j.tsf.2016.12.029.

Resources

Nitrogen gas gloveboxes with chamber of vacuum deposition of organic materials and metals (photo), oven (up to 450oC) and spin coating facilities inside; atomic force microscope; vacuum systems for thermal evaporation of organic materials and metals; PE CVD and HF CVD systems for deposition of layers of various materials (photo) with special graphene, CNT and diamond deposition tools.

Blue Wave HF CVD system

Glovebox with deposition in vacuum system

Contacts

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