

Liquid Crystals Laboratory

Keywords: Multistep synthesis, OLED, Purification



Vilnius
University



Research group activities

Organic electronics – that's a recent stage of electronics, based on use of organic compounds, mainly developed as a mean of visualization of information – that's well known LC screens, OLED screens, development of the last generation lighting devices. The Liquid Crystal Laboratory works in this field – working out new compounds and their production processes - since 1972. Along with an usual job of scientists – preparation and examination of new compounds and publication of results, this Laboratory prepares and supplies organic compounds to reagent catalog companies and direct industrial users. The main job of the laboratory – working out of new processes, suitable for production and deep purification of target organic compounds. Along with relatively simple compounds (such as alkylbenzenes and their functional derivatives) we also synthesize complex high-purity materials - such as liquid crystals (tolans, phenylpyrimidines), intermediates for OLED and other fields. Depending on the structure of the compound, the compounds are in prepared quantities

from grams to several kilograms, they are purified to a very high degree of purity - from an usual +98% purity simple compounds to +99.95% purity for some liquid crystals.

Our main research fields:

- Synthesis methods for nitrogen and sulphur heterocycles, highly branched aromatic compounds.
- New compounds and intermediates for OLED technology.
- Efficient technology for ultra-pure liquid crystal and OLED intermediates.
- The synthesis of organic compounds by methods known from the literature.
- A working out new methods of synthesis of selected structure organic compounds.



Proposal

- Working out new processes for production of target compounds;
- Preparation of new compounds for R&D stage.



Meet our team

Head - Dr. Povilas Adomėnas.

Author of more than 150 publications. During his 45 years of research experience Dr. Povilas Adomėnas gathered deep knowledge of fine organic synthesis, has experience in liquid crystals, OLED materials.

Research staff - Dr. Ona Adomėnienė, Virginija Žvinytė, Olegas Bobrovas, Valdas Kalcas.

PhD students - Virginijus Ruibys, Herkus Petrikas.



Research outcomes

Recent publications

- Karolis Kazlauskas, Gediminas Kreiza, Olegas Bobrovas, Ona Adomėnienė, Povilas Adomėnas, Vygintas Jankauskas, and Saulius Juršėnas.- Fluorene- and benzofluorene-cored oligomers as low threshold and high gain amplifying media.- Appl. Physics Letters, 2015, v. 107, p. 043301 (1-5).
- Renaldas Rimkus, Sigitas Tumkevičius, Tomas Serevičius, Regimantas Komskis, Povilas Adomėnas, Alytis Gruodis, Vygintas Jankauskas, Karolis Kazlauskas, Saulius Juršėnas.- Heterocyclic heptacene analogs – 8H-16,17-epoxydinaphtho[2,3-c:2',3'-g]carbazoles as charge transport materials. – Dyes and Pigments, 2016, v.124, p. 133-144.
- Tomas Serevičius, Regimantas Komskis, Povilas Adomėnas, Ona Adomėnienė, Gediminas Kreiza, Vygintas Jankauskas, Karolis Kazlauskas, Arūnas Miasojedovas, Vygintas Jankus, Andy Monkman, and Saulius Juršėnas. Triplet-Triplet Annihilation in 9,10-Diphenylanthracene Derivatives: The Role of Intersystem Crossing and Exciton Diffusion.- J.Phys.Chem., C, April 20, 2017 Vol. 121, Issue 15 , p. 8515–8524.

Most important projects:

- EU Structural Funds project „Flexible structure bearing bifluorene compounds for optoelectronics industry”, 2013–2015, VP1-3.1-ŠMM-10-V-02-023 ESFA.



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