AMPL-2017

PULSED LASERS AND LASER APPLICATIONS

September 10–15, 2017
Tomsk, Russia

ABSTRACTS

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Special Systems. Photonics, St. Petersburg, Russia

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MEDIA SPONSORS

Atmospheric and Oceanic Optics Journal, Tomsk, Russia
Photonics Journal, Moscow, Russia

Scientific & Technical Translations
STT
PUBLISHING
Tomsk, 2017

1.94 mm thickness, for magnetic field of 0.86 T and for 650 nm light rotates polarization plane by an angle equal to 5°13'.

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B-13

INVESTIGATION OF PHOTO- AND ELECTROLUMINESCENCE OF ZINC AND BERYLLIUM METAL ORGANIC COMPLEXES

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Three decades have passed since the publication of the first light emitting diodes based organic compound 8-hydroxyquinoline aluminum (Alq3) [1] and devices based on OLED are producing in the industrial scale, but the synthesis of new compounds and their investigation is continuing. A number of goals are pursued: a high efficiency of the device, the radiation in the required spectral range, stable performance.

In this paper we investigated metal-organic complexes with zinc and beryllium $(Zn(AM\text{-}TAZ)_2$, $Be(TB\text{-}TAZ)_2$ and the $Be(AM\text{-}TAZ)_2$ Photoluminescence characteristics were studied in solutions and films. OLED-structures were established on the basis of these compounds. The greatest emission intensity is ~ 1000 cd/m^2 provides $Be(AM\text{-}TAZ)_2$. $Be(AM\text{-}TAZ)_2$ and $Zn(AM\text{-}TAZ)_2$ with different metal, have different intensity of brightness and spectral characteristics. The electronic and photoluminescence of OLED-structures coincide. The greatest emission intensity ~ 1000 cd/m^2 provides $Be(AM\text{-}TAZ)_2$. $Be(AM\text{-}TAZ)_2$ and $Zn(AM\text{-}TAZ)_2$ with different metal, have different intensity of brightness and spectral characteristics. The spectral characteristics of electrical and photoluminescence OLED structures coincide.

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B-14

SPECTRAL-LUMINESCENT AND LASING CHARACTERISTICS OF THIN-FILM STRUCTURES BASED ON SEMICONDUCTOR POLYMERS

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The creation of injection laser based on organic semiconductors is urgent direction of organic electronics [1]. The solution of this problem is impossible without investigating the emission features of thin-film lasers based on organic semiconductors by various types lasers photoexcitation, including laser diodes [2–4].

The report presents the spectral-luminescent and lasing characteristics of copolyfluorenes and polyphenylenevinilene derivatives pumped by the third harmonic of YAG : Nd^{3+} laser. Copolyfluorenes were synthesized at the Institute of Macromolecular Compounds RAS. Also spectral-luminescent characteristics of thin-film structures by pulsed diode pumping were investigated. Thin-films based on selected semiconductor polymers were used as laser active medium.

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B-15

ELECTROLUMINESCENCE OF COPOLYFLUORENES IN THE VISIBLE RANGE OF THE SPECTRUM

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Organic electronics in the world has been actively developing for more than 25 years. Synthesis and research of new semiconductor materials for devices of organic electronics (organic light emitting diode – OLED, organic light-emitting field-effect transistor – OLET, organic semiconductor lasers – OSLs, etc.) is urgent task.

The report presents the spectral-luminescent and electroluminescent characteristics of new copolyfluorenes synthesized at Institute of Macromolecular Compounds RAS.

The electroluminescence of copolyfluorenes in light-emitting diode of the following structure ITO/Pedot:PSS/Copolyfluorene/Ca/Al is recorded in the visible range of the spectrum. Multilayered organic light-emitting diodes based on them were developed and analysis of the current-voltage and current-brightness characteristics was performed depending on the structure of the diode.

B-16

SPECTROSCOPY AND PHOTOCHEMISTRY OF HUMIC ACIDS

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Humic substances representing the main fraction of organic matter receive increased attention because of their reactivity as light absorbers. Depending on their origin and structure, humic substances have a remarkable ability to absorb light and transfer this energy to other substrates and in some cases strongly affect photolysis of xenobiotics. In water and in soils humic substances have been found to act as photosensitisers and they have also been reported to produce oxygen species upon irradiation, and be able to photoinduce the transformation of ecotoxicants. The photoquenching effects of humic substances on some chemicals are also known. Also, the possibility of an UV screening by humic substances on chemicals cannot be excluded since the energy-transfer and charge-transfer between the chemical and humic substances can deactivate the excited molecules. Excited singlet and triplet states of dissolved humic acids (HAs), the major component of humic substances, are important players for the transformation of organic chemical contaminants in natural waters. Our knowledge about these processes is still very limited. Spectroscopy and photochemistry of humic acids are disscused.

The results in a flow reactor for photodegradation of ecotoxicants are presented. A specific feature of the reactor is the use of barrier discharge excilamps (Xe_2, KrCl and XeCl) with different radiation wavelengths (λ = 172, 222, 308 nm). The discussion includes comparative analysis of the direct and indirect photolysis. The samples of HAs fractions were obtained from Aldrich Chemical Co and prepared from peat of Tomsk region.

This work is supported by the Base Part of State Task of Board of Education and Science RF No. 4.6027.2017/BTCH.