AMPL-2017

PULSED LASERS AND LASER APPLICATIONS

September 10–15, 2017
Tomsk, Russia

ABSTRACTS

GENERAL SPONSOR

Special Systems. Photonics, St. Petersburg, Russia

CONFERENCE ORGANIZERS

Institute of Atmospheric Optics SB RAS
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MEDIA SPONSORS

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

Scientific & Technical Translations
STT
PUBLISHING
Tomsk, 2017

This work was supported by the Base Part of State Task of the Ministry of Education and Science of the RF (Project No. 4.6027.2017/8.9).

1. *Terenin A.N.* Photonics of Dye Molecules / Nauka, Leningrad (1967). [in Russian]
2. *Artyukhov V.Ya., Kopylova T.N., Samsonova L.G., et al.* // Rus. Phys. J. 2008. V. 51. No. 10. P. 1097–1111.

B-23

SPECTRAL-LUMINESCENT AND PROTON-ACCEPTOR PROPERTIES OF BIOLOGICALLY ACTIVE HYDROXYL-SUBSTITUTED BENZALDEHYDES

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Using methods of electronic spectroscopy and quantum chemistry (INDO method) the electronic structure and spectra of some hydroxyl-substituted benzaldehydes have been investigated. Comparison of accuracy of the description of spectral-luminescent properties and intramolecular photophysical processes in the isolated molecules received in calculations and experiments is spent. Influence of hydroxyl and tret-butyl substitution on distribution of electronic density and proton-acceptor ability of molecules in the basic electronic state is considered.

Possibilities of investigated derivatives to form intra- and intermolecular hydrogen bonds are estimated. The substitutes entered in phenol fragment of investigated molecules, make various impact on proton-acceptor ability of derivatives of benzaldehyde. Thus appreciable influence renders not only a replacement place, but also a spatial structure of substituting fragments. Correlation between value of MEP, connected with hydroxyl substitutes, and antiviral activity of compounds under investigated,, estimated on cell culture of viruses of a herpes of flu [1] is established.

This work was supported by the Base Part of State Task of the Ministry of Education and Science of the RF (Project No. 4.6027.2017/8.9).

1. *Shadyro O.I, Sorokin V.L, Ksenzova G.A, Savinov O.V, Samovich S.N., Pavlova N.I., Polozov G.I., and Boreko E.I.* / Chemical-farm. Zhurn. 2016. V. 50. No. 3. P. 20–22.

B-17

LUMINESCENCE PROPERTIES OF HEAVILY DOPED *ALGAN* FILMS UNDER OPTICAL AND ELECTRON BEAM EXCITATION

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Spectral characteristics of spontaneous and stimulated luminescence were investigated from the $Al_xGa_{1-x}N/AlN$ solid solutions with Si dopant concentration more than 10^{20} cm^{-3} at $x = 0 \ldots 1$, which were grown by molecular beam epitaxy on sapphire substrates. The excitation of $Al_xGa_{1-x}N$ films was carried out by pulsed laser radiation ($\lambda = 266$ nm) from the Nd: YAG laser with a power density of up to 9 MW/cm^2 and an electron beam with an electron energy of up to 20 keV and the current of up to 100 A, formed in an "open" discharge. Figure (*a*, *b*) shows typical spectra of spontaneous photoluminescence – (*a*) obtained at an angle of 45° to the surface and cathodoluminescence spectra from cleaved edges of the structure – (*b*).