Photonics of novel zinc(II) and boron(III) dipyrromethene complexes

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The photonics of the new organic luminophores – coordination compounds Zn(II) and B(III) with dipyrromethenes are the one of the most actual nowadays. It is caused by the possibility of using these compounds as markers and fluorescence probes, optical sensors on oxygen and temperature, OLED-s, solar probes, laser media. Investigation into the photonics of these compounds is of great importance for effective uses in different optical devices. The aim of this work was to investigate the spectral-luminescent and lasing properties of coordination compounds of Zn(II) with dipyrromethenes on the excitation parameters in comparison with the dipyrromethene BF_2 complexes with a similar ligand structure.

The analysis of the results shows that the spectral and luminescent parameters of BF2 and Zn dipyrromethene complexes are determined by the structure of the ligand. The replacement of the central atom boron(III) by zinc(II) not only causes a twofold increase in the number of coordinated chromophoric ligands, but also adds to non-planarity of the chromophores and contribution of nonradiative processes in excitation energy deactivation, resulting in a decrease in the fluorescence yield. The solvent nature has a little effect the spectroscopic properties, but it changes significantly the photophysical characteristics of the compounds. The results obtained in this work can be used as the basis for the design of optical devices.

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