Synthesis and properties of two classes of thiazole-based organoboron fluorophores possessing the AIEE/AIE effect

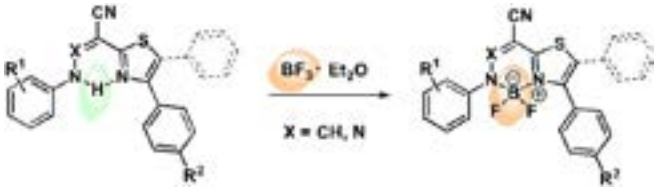
Belskaya Nataliya[1], Kseniya I Lugovik[1], Alexander K Eltyshev[1], Polina O Suntsova[1], Pavel Slepukhin[2] and **Enrico Benassi[3]**

[1]Ural Federal University, Russia

[2]Ural Branch of Russian Academy of Science, Russia

[3]Nazarbayev University, Republic of Kazakhstan

Luminescent organoboron molecular systems have been receiving an increasing amount of interest over the past few decades. The presence of boron in the structure of organic compounds leads to substantial modifications in the molecule's electronic structure due to the electron deficiency of boron. Some boron complexes featuring diketones, iminoketones azo dyes, β-enaminones, β-ketoiminates, and hydrazones have shown high fluorescence in the solid state and either aggregation-induced emission (AIE) or aggregation-induced emission enhancement (AIEE). However, although BF2 complexes are actively being synthesized and investigated, only a few examples of AIE/AIEE-active luminophores have been reported in the literature due to the deficiency of appropriate frameworks. Moreover, the number of known AIE/AIEE-active boron complexes that efficiently emit in the solid state is still limited. We recently reported the synthesis and photo physical characteristics of the aryl enamine and aryl aza-enamine thiazoles, which show weak fluorescence in solution that was proven to be caused by intramolecular hydrogen bonding and that is very sensitive to the microenvironment. The structure of the these thiazole derivatives includes a convenient combination of functionalities and may be used as a bidentante N, N-ligand to synthesize BF2 complexes. We report now about synthesis of two new series of promising thiazole-containing BF2 complexes and their spectroscopic and photo physical characterization. These investigations were performed in solution, powder and aggregation states. Solvato(fluoro)chromism was also explored. Some structure-property relationships were rationalized by DFT calculations.



Biography

Belskaya Nataliya has completed her Doctor Sciences thesis at Ural Federal University, Russia in 2011. She was appointed as Associate Professor at Ural Federal University in 2006, becoming a full Professor at the same university in 2012. Till 2017, 75 publications have appeared in international and Russian journals about her work that have been cited over 200 times. Her research is focused on the chemistry of heterocyclic compounds, pericyclic reaction and design, synthesis and investigation of fluorescent compounds in the solutions, suspension and solid state.

n.p.belskaya@urfu.ru

Notes: