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π -Conjugated B/N-Doped luminescent materials with chiroptical properties and Open-Shell character

Abstract:

Synthetic organic dyes with low-energy absorption and emission properties, especially in the red-to-near-infrared (NIR) region are used as photodetectors and laser filters in optoelectronics and medical applications. However, this type of organic materials have rarely been reported in the literature. The incorporation of main group elements (such as B, N, P and Si) into organic systems has been established for decades to achieve functional modifications of organic π -conjugated materials. Those B/N-doped main-group compounds have particularly attracted considerable research interests due to notable contribution to the electronic properties. New chiroptical materials with circularly polarized luminescence (CPL) have recently found numerous applications in photonics, smarting sensing and (bio)imaging as well as information technology. As part of our pursuits of organoborane chemistry in our group, this work will focus on the molecular design, synthetic methodology and characterization of organoborane macrocycles and CPL-active materials with emission in the red-to-NIR region and with the open-shell characters.

Biography

Pangkuan Chen has completed his PhD in 2012 from Rutgers University with Prof. Frieder Jakle, and then post-doctoral studies at MIT with Prof. Niels Holten-Andersen. He is the full professor of Beijing Institute of Technology, where he also serves as the director of Beijing Key Laboratory of Photoelectronic/Electrophotonic Conversion Materials. He has published more than 60 papers in reputed journals. His current research builds on organoborane chemistry, π -conjugated macrocycles, Near Infrared (NIR) circularly polarized luminescence, chiral radical chemistry and dynamic B/N Lewis pairs.