

Optical and electronic properties of 3-coordinate organoboron compounds including applications in mitochondrial imaging in live cells

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Three-coordinate organoboranes possess an empty p-orbital at the boron center and can display interesting photophysical behavior due to their strong π -acceptor properties making them suitable for many applications in optoelectronics,[1] sensing,[2] etc.[3,4]. We have been examining the synthesis, linear and nonlinear optical properties of 3-coordinate organoboron compounds of different (dipolar, quadrupolar, octupolar) geometries for 25 years. Recently, we have focused on developing new boron-substituent combinations which provide enhanced air-stability as well as enhanced acceptor strength.[5,6,7,8,9] The lecture will present selected examples from our work which illustrate important concepts in design and optical properties, including the development of water-soluble and stable 3-coordinate boron compounds fluorescence imaging of mitochondria in live cells, and for 2-photon excited fluorescence imaging.[10]

(1) L. Ji, S. Griesbeck, T. B. Marder, *Chem. Sci.* **2017**, *8*, 846; C. D. Entwistle, T. B. Marder, *Chem. Mater.* **2004**, *16*, 4574; *Angew. Chem. Int. Ed. Eng.* **2002**, *41*, 2927.

(2) C. R. Wade, A. E. J. Broomsgrrove, S. Aldridge, F. P. Gabbaï, *Chem. Rev.* **2010**, *110*, 3958.

(3) A. Lorbach, A. Hübner, M. Wagner, *Dalton Trans.* **2012**, *41*, 6048.

(4) F. Cheng, F. Jäkle, *Polym. Chem.* **2011**, *2*, 2122.

(5) Z. Zhang, R. M. Edkins, J. Nitsch, K. Fucke, A. Steffen, L. E. Longobardi, D. W. Stephan, C. Lambert T. B. Marder, *Chem. Sci.* **2015**, *6*, 308.

(6) Z. Zhang, R. M. Edkins, J. Nitsch, K. Fucke, A. Eichhorn, A. Steffen, Y. Wang, T. B. Marder, *Chem. Eur. J.*, **2015**, *21*, 177.

(7) Z. Zhang, R. M. Edkins, M. Haehnel, M. Wehner, A. Eichhorn, L. Mailänder, M. Meier, J. Brand, F. Brede, K. Müller-Buschbaum, H. Braunschweig, T. B. Marder, *Chem. Sci.* **2015**, *6*, 5922.

(8) L. Ji, R. M. Edkins, A. Lorbach, I. Krummenacher, C. Brückner, A. Eichhorn, H. Braunschweig, B. Engels, P. J. Low, T. B. Marder, *J. Am. Chem. Soc.* **2015**, *137*, 6750.

(9) X. Yin, J. Chen, R. A. Lalancette, T. B. Marder, F. Jäkle, *Angew. Chem. Int. Ed.* **2014**, *53*, 9761.

(10) S. Griesbeck, Z. Zhang, M. Gutmann, T. Lühmann, R. M. Edkins, G. Clermont, A. N. Lazar, M. Haehnel, K. Edkins, A. Eichhorn, M. Blanchard-Desce, L. Meinel, T. B. Marder, *Chem. Eur. J.* **2016**, *22*, 14701.