Borazine Doped Polyphenylenes

***F. Fasano*, D. Marinelli and D. Bonifazi**
School of Chemistry, Cardiff University, Main building, Park Place, CF10 3AT, Cardiff, United Kingdom.

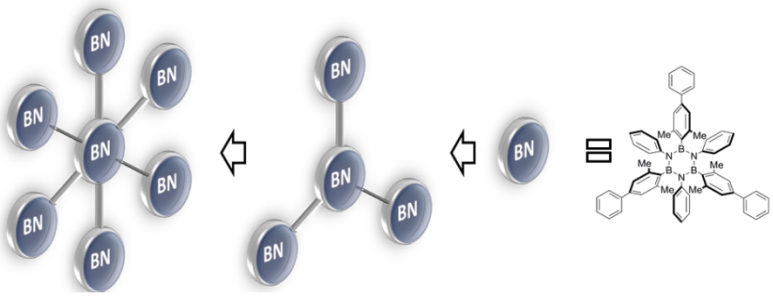
FasanoF@cardiff.ac.uk

Oligo-*para*-phenylenes and poly-*para*-phenylenes are appealing materials in view of their potential applications thanks to their attractive optoelectronic properties.[1]

One can tune these properties by replacing two carbon atoms by one boron and nitrogen atom, affording isoelectronic molecular system that present strong local dipole moment.[2] This polarity significantly alters electronic and optical molecular properties as it modifies the character of the frontier molecular orbitals, the HOMO and LUMO gap, and the solid-state arrangement.

In this respect, borazines[3] have recently renewed their interest as the active materials for preparing optoelectronically-active materials[4] and as precursors for doping graphitic nanostructures.[5]

In view of these applications, hybrid polyphenylenes scaffolding exposing borazine cycles placed in selected positions at a given ratio could represent an unprecedented class of building blocks to prepare π-extended molecular boron-nitrgen-carbon (BNC) hybrid materials with tailored chemical and optoelectronic properties.



1 C. Li, M. Liu, N.G. Pschirer, M. Baumgarten, K. Mullen, *Chem. Rev.* **2010**, *110*, 6817-6855.
2 a) E. R. Abbey, L. N. Zakharov, S. Y. Liu, *J. Am. Chem. Soc.* **2011**, *133*, 11508-11511; b) A. J. V. Marwitz, A. N. Lamm, L. N. Zakharov, M. Vasiliu, D. A. Dixon, S. Y. Liu, *Chem. Sci.* **2012**, *3*, 825-829.
3 D. Bonifazi; F. Fasano; M. M. Lorenzo-Garcia; D. Marinelli; H. Oubaha; J. Tasseroul, *Chem. Commun.* **2015**, *51*, 15222–15236.
4 I. H. T. Sham; C.-C. Kwok; C.-M. Che; N. Zhu, *Chem. Commun.* **2005**, 3547–3549.
5 C. Sánchez-Sánchez; S. Brüller; H. Sachdev; K. Müllen; M. Krieg; H. F. Bettinger; A. Nicolaï; V. Meunier; L. Talirz; R. Fasel; P. Ruffieux, *ACS Nano* **2015**, *9*, 9228–9235.