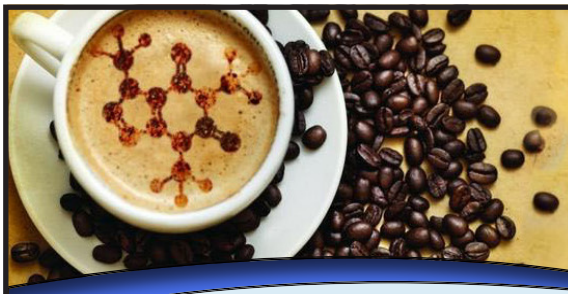

CoffeeTalk@ISOF

EXTENDED EDITION

Tuning optoelectronic properties of heteroatom-doped aromatic hydrocarbons

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Among the plethora of organic semiconductors available, polycyclic aromatic hydrocarbons (PAHs) certainly attract tremendous attention. They currently find a wide range of applications, such as in organic electronics, photovoltaics, biomedical sensors and light-harvesting materials. With respect to infinite graphene, PAHs display non-zero tunable bandgaps and are therefore of interest in general in all optoelectronic applications requiring a tunable semiconducting material. Bottom-up covalent synthesis can be exploited as a method to access structurally defined heteroatom-doped PAHs with precise control over the size, periphery, substitution pattern, doping ratio, and position. In this respect, perixanthenoxanthene (PXX) and borazine (BN) can be conceptualized as building units for engineering new classes of hetero-atom doped PAHs, in which redox and photophysical properties are fine-tuned as a consequence of i) the type of linkage between hetero-atom and carbon scaffold and ii) the insertion of isostructural subunits within the aromatic skeleton.

Andrea Fermi graduated (MSc) from the University of Pavia in 2009 and obtained his PhD degree from the University of Bologna and the Aix-Marseille Université in 2013, under the supervision of Prof. Paola Ceroni and Prof. Marc Gingras, joining the Vinci Program of the Franco-Italian University. After a postdoctoral stay at the University of Bologna, he moved in the research group of Professor Davide Bonifazi at University of Namur, Belgium. Since late 2015, he is a postdoctoral research associate at the School of Chemistry of Cardiff University, United Kingdom.

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