

Subphthalocyanines: singular aromatic non-planar and chiral molecules

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- **Miércoles 18 de diciembre a las 15 hs.**
- **Aula RFP - 3er piso DQIAQF/INQUIMAE**

Resumen

Due to their exceptional structural and photophysical properties, such as pronounced absorption and/or emission in the UV-vis and near-infrared (NIR) spectrum, superior charge transport characteristics, and a broad chemical adaptability, Subphthalocyanines (SubPcs; Figure 1a) occupy a distinguished position among the most widely explored and versatile porphyrinoids [1]. These aromatic macrocycles, characterized by their distinctive non-planar structure, exhibit significant potential across various cutting-edge applications. These applications include the creation of polar superstructures, the development of thermotropic and lyotropic liquid crystals, the utilization as non-fullerene acceptors, and as materials for singlet fission.

Herein, we unveil pivotal aspects within SubPc chemistry that are ushering in a new era in the conception, synthesis, and utilization of these macrocycles [2]. We will elucidate how SubPcs can be harnessed in molecular photovoltaics, serving as materials for singlet fission, and explore their enantiopure versions in chiral technologies (Figure 1b-d) [3]. Additionally, we will present the synthesis and characterization of SubPc columnar materials and the on-surface synthesis approaches to construct 2D-Chiral Polymers.

