



12 Abril 2023

12.00 h
Sala de Grados
Facultad de Ciencias



INMA

Impulso

Design and Synthesis of Molecules for the Self-Assembly in Stimuli-Responsive, Functional Soft Materials



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Functional materials combining fluid properties with molecular anisotropy can be manipulated by external stimuli like light, temperature, mechanic, magnetic and electric fields and addition of guests or dopants and thus can either be correctly positioned to optimise materials performance or they might report environmental influences. Among such materials, the family of liquid crystals is most prominent. We design and synthesise complex molecules with at least two functional complementary conjugated building blocks by convergent synthetic methods and decorate the molecular periphery with a variety of flexible chains to induce the stimuli responsive properties. Combinations of porphyrins, phthalocyanines, subphthalocyanines with conjugated oligo(phenylenevinyls), oligothiophenes and fullerenes or nucleobases result in a large number of nanostructured lamellar, columnar, helical and gyroid cubic structures which might find application e.g. in soft matter electronics.