8 de MAYO de 2024

12.00 h
Sala de Grados, Ed. A Facultad de Ciencias, Campus San Francisco

INMA Junior

"Biomimetic linear-dendritic hybrids: dendritic effect and bioadhesion"

Alexandre Lancelot
CLIP Group, INMA-CSIC/UNIZAR

Catechol moieties are found in several adhesive proteins secreted by mussels and other bivalves thanks to their potential to foster strong adhesive interactions by means of H-bonding, π-π stacking, metal chelation and covalent bonding. Hence, mimicking mussel adhesive proteins, a library of catechol-containing copolymers has been synthesized. These polymers usually showed good adhesive properties when used in dry conditions and impressive adhesive properties when used underwater.
In the present work, we designed and synthesized two series of Hybrid Dendritic-Linear-Dendritic Block Copolymers (HDLDBCs) based on: *(i)* either poly(ethylene glycol) or poly(ethylene glycol)-poly(propylene glycol)-poly(ethylene glycol), aka Pluronic® F-127, *(ii)* 2,2-bis(hydroxymethyl)propionic acid and *(iii)* terminal catechols. These HDLDBCs showed good adhesive properties on aluminum substrates when applied in dry conditions, with values up to 7 MPa. Interestingly, a clear dendritic effect was observed with adhesion strength values increasing with dendron generation for both series. Additionally, these HDLDBCs were applied onto porcine skin to study their abilities to be used as biomedical adhesives. Pluronic® derivatives displayed adhesion on skin, with values up to 2 kPa. These values were similar to those of Tisseel, a commercial FDA-approved tissue sealant, paving the way for a possible future application of this HDLDBCs in biomedicine.

"Chiral Nanoporous Materials: Towards Enantiomeric Separation Through Liquid Crystals"

Silvia del Moral Peñas
CLIP Group, INMA-CSIC/UNIZAR

Nanoporous Materials represent an important field in Materials Science, offering large applications, ranging from catalysis to drug delivery. Among different strategies for their obtention, the incorporation of Liquid Crystals (LCs) emerges as a powerful methodology, revolutionizing the ability to engineer tailored nanoporous architectures with meticulous control over their properties. Particularly, Columnar Liquid Crystals (CLCs) have been widely used to obtain 1D nanopores with an accurate control of their size, charge, or acid/basic nature. In this work, chirality is added as a new parameter. Incorporation of chiral centers into these materials paves the way to a new application: distinction among enantiomers. There are different approaches to get these materials, one based on a central template and another on hexameric structures. Some of them will be presented to give an overview of the work done so far.

INMA INSTITUTO DE NANOCIENCIA Y MATERIALES DE ARAGÓN
CSIC Consejo Superior de Investigaciones Científicas
Universidad Zaragoza 1542